

Community, Public Space and Digital Data

Bologna interactive urban furniture lab

arredo urbano
spazio pubblico
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interazioni sociali
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urban furniture
public spaces
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Bologna

Attraverso la manifestazione di tracce digitali, la ricerca mostra come sia possibile dare valore a comportamenti e azioni presenti nello spazio in un certo momento, rievocandole come echi in successive temporalità nello spazio. Il contributo si inserisce nell'ambito problematico della città contemporanea - il contesto applicativo sono il Quadrilatero Malvasia e il quartiere Barca di Bologna -, nei cui spazi si stratificano giorno dopo giorno i dati digitali prodotti dallo spazio e dalle persone che vi transitano. Le espressioni progettuali legate al product design che approfondiscono, nella dimensione urbana, la relazione dato digitale/spazio/comportamento utente, mostrano una limitata varietà di metodologie e di effettivi casi studio. La sperimentazione effettuata dal gruppo di lavoro si inserisce in questo ambito e fornisce alcune originali direzioni progettuali ai designer che si spingano ad immaginare nuovi oggetti urbani.

Through the manifestation of digital traces, the research demonstrates how it is possible to value behaviors and actions present in space at a certain moment, recalling them as echoes in subsequent temporalities within space. The contribution fits into the problematic of the contemporary city, the applied context being the Quadrilatero Malvasia and the Barca neighborhood in Bologna, where spaces are layered day after day with digital data produced by the space itself and the people who pass through it. Product design that delves into the urban dimension, exploring the relationship between digital data, space, and user behavior, are explored to reveal a variety of methodologies. Experimentation carried out by students working groups, in cooperation with the course in Advanced Design of University of Bologna and the local cultural association Fondazione e Innovazione Urbana, provides some original design directions for designers who venture to imagine new urban objects.

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Citation: D'Alessandro, M.; Dall'Osso, G. (2024). "Community, public space and digital data", UOU scientific journal #07, 84-95.

ISSN: 2697-1518. <https://doi.org/10.14198/UOU.2024.7.11>
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Article Received: 11/03/2024
Received in revised form: 11/05/2024
Accepted: 18/05/2024



INTRODUCTION

A threshold is a suspended space that lies between two different conditions, capable of uniting and separating at the same time. In a design context, threshold therefore defines a boundary condition and represents a fertile ground for exploration of the imagination and creation of unusual connections, leading to boundary experiences and experimentation. Applied to reflection on the public spaces of the contemporary city, the concept of threshold opens new research scenarios that bring together material and immaterial elements in the definition of new urban paradigms in which the community can build and recognize its own identity.

The city is built by people. It is composed of both a tangible and material structure in space that shapes the urban configuration, and a free space in which events follow one after the other housed in buildings or in their shadows. In this context, the city can be read as a synthesis of volumes and voids sequential and continuously transforming. The way we comprehend the world undergoes inherent processing as we intersect with it, particularly through the traversing of 'empty' space, as elucidated by Bruce Chatwin (Chatwin, 1988). In this context, emptiness signifies a realm of potentiality, accommodating the existence of various elements, the mobility of individuals, and the manifestation of individual behaviour, as articulated by Francesco Careri (Careri, 2006). According to Fernando Espuelas (Espuelas, 2004), unoccupied space is the domain of penetrability where life unfolds, and contingent time materializes; it is the backdrop that envelops actions, thereby enriching their significance. As stated by Oswald Mathias Ungers:

"The arrangement of architectural elements in space can be interpreted as the staging of a spectacle. The organization of objects in space is the scenography of a stage for various human activities, for the roles of actors, for the life that takes place

there. Therefore, each area, each place transforms into an architectural stage that hosts the representation of the individual if the stage is private, or of the community if it is a public stage, i.e., the city" (Ungers, 1998, 20).

This paper assigns the void as an experimental field with a double meaning. On the one hand emptiness has an ontological significance in relation to how humans inhabit space. The void becomes a place of potential transformation revealing a new perspective for perceiving and understanding the constructed reality. On the other hand, the void configures itself as a container of invisible information and data. The urban spaces that people pass through and inhabit everyday are increasingly influenced by the digital data they produce and that remains referenced to them. This data contributes to shaping what we could define as the 'Digital overground' (Zannoni, 2018, 38), molding the identity and memory of places themselves (Formia, Zannoni, 2018, 120). The relationship between urban space and digital data is bidirectional, playing a key role in defining new directions in the way the city is inhabited. Digital data, while not the sole element for understanding urban voids, represents a crucial system of relationships and behaviours for the innovative development of urban, social, cultural, and environmental strategies, inspired by the concepts of response-ability and ongoingness. The spaces of the contemporary city become the context in which digital data, produced both by the space itself and by the people who inhabit or traverse it, transform, shaping the space and enriching its meaning.

It is from these considerations that the first part of this paper offers an overview of research that in recent decades has addressed the theme of urban space and digital data. The physical structure of architecture here represented a fixed, permanent, and immutable factor capable of accommodating mutable activities, uses, experiences, and data, generating layered spatiality. What we aim

to investigate in this paper is how the space of the contemporary city assimilates design alterations that intervene in the fixity of existing space, overlaying digital characteristics, selecting privileged perspectives, creating connections or barriers, repositioning objects, and manifesting data. Starting from these considerations, the paper asks what role can the synergy between urban space and digital data play in the city of tomorrow?

This contribution presents some outcomes of experimental research on the city of Bologna¹ that addresses the theme of requalifying public space by investigating new relationships between space, time, and community. The presentation of the examined design examples, which operate in the field of product design in relation to the city, revolves around five themes that refer to different ways of interpreting the theme, depending on the different contexts and scales with which the projects engage. The design research was completed as part of the Urban Data Sensification course at Advanced Design, Department of Architecture, University of Bologna. The didactic project experience was complemented by research carried out in close collaboration with the Fondazione Innovazione Urbana (FIU). The contribution of the FIU association strengthened the research's connection to the city's inhabitants, monitoring urban transformation processes in depth and in a capillary way.

URBAN FURNITURE AND ENABLING TECHNOLOGIES

The urban environment encompasses various design initiatives that introduce objects into collective spaces to support the behaviours and needs of people who traverse and linger within it. The forms of urban furniture are influenced by both functional and industrial logics akin to the realm of furniture; however, their placement is governed by criteria linked to observed or anticipated uses within the space. This is why the ability

of the designer to interpret the space and its inherent dynamics is central to the design of urban furniture. This is how an open area, through the incorporation and orientation of benches (Alexander and others, 1977, 1121), becomes a resting space where the user can either observe what is happening or actively engage with people nearby. Similarly, typical wayfinding elements transform places into routes and regulate the behaviours of spaces (Gibson, 2009, 56; Pillozzi, 2013).

Considering the complex field that describes how urban space encompasses not only the tangible dimension of the city but also the intangible digital one, urban furniture emerges as an appropriate means of transmitting and transducing data in the community's urban spaces. It is through this combination that scientific and design research suggests a pathway that leverages the digital component as an innovative trigger to enhance the social dimension within the voids of the urban fabric (Stokes and others, 2021). The domain of the project that combines urban furniture with enabling technologies is not yet widely pervasive in cities, but there are already numerous examples that can guide in categorizing some ways

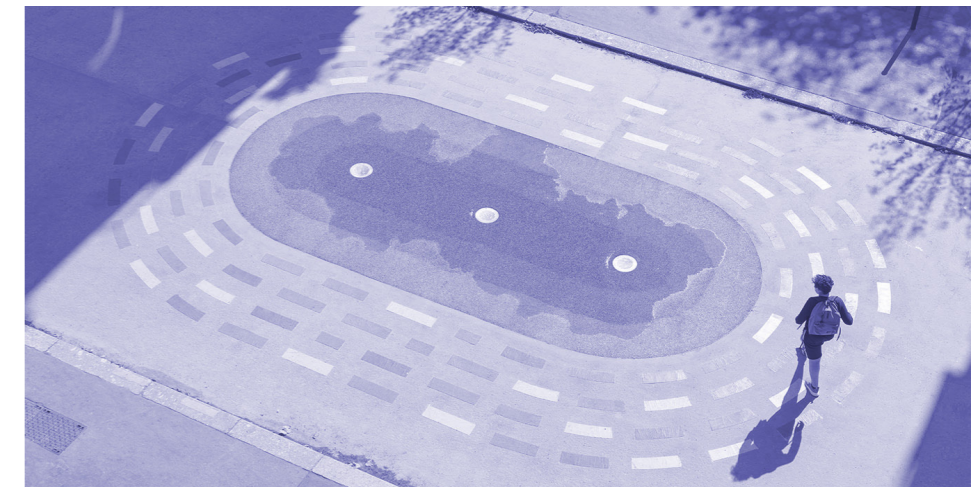


Fig.1 – Aéro-Seine #2 project, 2020 © Studio Idaë.

through which these fusions exhibit element of originality.

The first level through which digital data effectively enters urban furniture is the quantitative reading of space. Through a reading of space via dedicated sensors, it is possible to conduct extensive and precise data collection campaigns that allow designers to gather objective perspectives for intervention. An example is the *Aéro-Seine #2 project*² (2020), where designers from the Studio Idaë collected data related to localized excessive temperatures in certain parts of the city (Fig.1). The survey enabled the design of a site-specific system where non-potable water is used to cool the specific areas of Paris.

A different approach is taken by projects like *#mimmi*³ (2013) by the Invivia studio (Fig.2) and *Whithervanes*⁴ (2017) by the Rotooftwo studio, where urban furniture elements are designed with the ability to change their chromatic and luminous behaviour based on data collected through social networks or news blogs. In these cases, textual information is scanned and analysed through semantic analysis, clustering words and phrases into groups of emotions. Each cluster corresponds to the behaviour of the object in space. The dynamic characteristics of the object enter the realm of human perception and become a narrative tool for the underlying themes of the interventions.



Fig.2 – #mimmi Project © Invivia studio.



Similarly, the *Bubbles project*⁵ (2006) by Foxlin Architects uses data to transform the object (Fig.3). The difference from the previous project is that while in that case the data is processed before leading to a response, here the reading of digital information occurs in real-time and has an immediate consequence on the behaviour of the objects. Large air-bags expand or contract based on the number of people crossing space.

These are just a few examples of a growing body of projects that combine the realm of product design with the design of open urban spaces where themes of placemaking and placekeeping come to the forefront.

Placemaking (Granata, 2021, 3; Stokes and others, 2021) refers to design actions aimed at strengthening and renewing the identity of community spaces, while placekeeping (Dempsey, Smith, Burton, 2014, 173; Mattijssen and others, 2017, 71) refers to actions aimed at encouraging citizenship to care for common places. In relation to these goals, enabling technologies have significant potential to revitalize objects already present in cities. Examples include placemaking

projects carried out by the Calvium studio in the UK⁶. Through a thorough analysis of citizens' needs, the studio developed digital applications for managing everyday spaces; furthermore, digitally implemented objects were identified, designed, and realized to enhance the functionalities related to the memory of places and the connection between actors who inhabit the common spaces of the city.

RESEARCH METHOD

These different approaches can be seen as design guidelines or methodologies developed synergistically. In this paper, a methodology for approaching the design of urban furniture arises from a qualitative and quantitative reading of space. This evolves a conscious design action, ready to respond in a heterogeneous manner. This project approach leads to the creation of interactive spaces (Dall'Osso, D'Alessandro, Melappioni, 2022, n.p.), meaning places and objects capable of transforming to meet the needs of the people they accommodate, guiding or perceptually suggesting multiple functions. By transformation, we mean the

Fig.3 – Bubbles project © Foxlin Architects.

possibility that changes in certain characteristics of objects lead to an effective modification of the real or perceived space. Through these changes, the digital component of urban furniture projects can lead to breaking physical or perceptual boundaries of space with people or spaces nearby or distant in time and space. In the urban context, enabling and emerging technologies offer stimulating potential aimed at breaking ancient boundaries and balances, proposing design nuances within the boundaries that contemporary cities present. Experimentation within the course has obvious differences and abstractions from live projects but can be taken here as the starting point for a methodological paradigm for application outside of the academic context. To guarantee a concrete adherence to the contemporary cities' problems in research premises and design outcomes, the research engages in consultation with the local community. The starting point of the investigation is the study of the project's urban space and the involvement of local communities to uncover the issues or needs for the project to resolve. In this investigation of possible innovative trajectories of urban

transformation, local participation and collaboration were important tools to investigate the multiple features of neighbourhoods. In synergy with FIU in Bologna, the work enables data to be collected for the interpretation of the urban spaces as layered space of traces, that are invisible yet powerful. FIU is a multidisciplinary centre for research, development, co-production and communication of urban transformations at the service of the construction of the city's imaginary future. FIU is the relations' promoter between public administration, enterprises, third sector and citizens. It plays a role in driving, accompanying, facilitating, and experimenting the city's transformation processes, both in terms of policy planning and civic governance and design. The FIU designs, manages, facilitates and communicates urban transformation processes; enhances knowledge, methodologies, and people; develops shared paths of construction of urban spaces and services; activates places and moments of public debate, co-production and dialogue between citizens, institutions, associations, movements and representatives of economic, social and cultural world.

The understanding of the urban space is developed through a site survey to build a qualitative and quantitative knowledge of spaces and relations. Fundamental steps to the project development are historical analysis, comparison between georeferenced data and open data collected by the municipality, direct field investigations and interviews. Driven by this gathered knowledge of spatial characteristics, in terms of both the material urban space and the invisible space of digital data, the project is developed through an interpretation built around specific thematic clusters, as activation of connections among individuals sharing a common environment; interaction with urban fauna and flora; engagement with the cultural facets of the city; fostering a sense of well-being within inhabited spaces; interplay between the individual and communal spheres. The project outcomes

represent an experimentation on individual themes, tracing innovative ways of triggering urban integrated transformations with the community. The conclusion of the research takes place with the sharing of these experimental experiences with the community that participated in the research, tracing a virtuous cultural, communicative and participatory circularity.

BOLOGNA AS DESIGN LAB

The nexus between the terms city, community and public space expresses the very essence of urban civilization, from its birth with the community transformation from a mere aggregation of individuals, through to the erosion and decay of public spaces and might conclude –if we do not counter it– with the gradual death of the city. Richness, significance and problems of urban civilization cannot be understood without considering the triad 'urbs-civitas-polis' (city-community-public spaces): city as physical reality, city as society and city as government. It can be said that cities were born with public spaces when people needed to organize themselves (as urbs, as civitas and as polis) around certain functions and places that could serve the community as a whole. This is the basic reason public spaces have always been important in the city of European tradition: places in which to be together, to trade, to celebrate religious rites, to perform common activities and use common services.

In this context, the contemporary city becomes an experimental ground of considerable interest to understand if and how the incorporation of digital data into the city-community-public spaces triad can be a trajectory to stimulate a possible and progressive cohesion between urban space and people who inhabit and pass through it. The city is not only physical reality, society and government, but also data. In this sense, the city becomes a framework for people and events that produce data georeferenced to space. That is, intangible

traces of habits, invisible signs of criticalities, whispered adjectives describing the intangible qualitative and quantitative characteristics of places. The potential of the digital dimension of urban space, combined with the city's physical and material context, can generate dynamic relationships between spaces, times, places and people. The use of digital technologies in public space can activate processes of connection and involvement between community and space. Our research developed by applying data-space-personal investigation to specific urban places.

Two Bologna districts, different in terms of historical reference period, size and spatial configuration, were chosen in order to represent the paradigm of the current crisis of collective urban space, so evident especially in the peripheral parts of our cities. Public spaces, which radiate into these neighbourhoods through streets, squares, parks and gardens, are often characterized by a state of urban and social decay. The lack of clear and accessible connections between neighbourhoods, the rest of the city and the historic centre, combined with the lack of services and the ineffectiveness of land management policies, are some of the factors that have contributed to the current condition of these suburbs. Such urban portions are in fact subject to rapid degradation, not only architectural and urban, but also environmental, social and cultural. Today, after recent crises, the redevelopment of these parts of the city is even more urgent, starting with the meaning and the role that public space can assume in this process, in synergy with digital data and community. Bologna, becomes a city of experimentation in which to apply the research hypotheses. Specifically, the Malvasia Quadrilateral and Barca district are considered as an experimentation field for the public space-city-community data's intertwining, outlining a new narrative of the contemporary city, through the relationship of elements' intertextuality (Ricoeur, 2013, n.p.).



Fig.4 – Quadrilateral Malvasia, Bologna, 2022 © Martina D'Alessandro.



Fig.5 – Quadrilateral Malvasia, Bologna, 2022 © Martina D'Alessandro.



Fig.6 – Neighborhood Barca, Bologna, 2023 © Google Maps.



Fig.7 – Neighborhood Barca, Bologna, 2023 © Google Maps.

Malvasia is a residential district known as Quadrilatero because it is defined by four streets, Via Malvasia, Via Casarini, Via dello Scalo and Via De Crescenzi (Fig.4). In the early 1930s, Bologna was experiencing a moment of great urban development as the number of inhabitants had doubled over three decades. The policies of redevelopment of the city centre and the construction of a few expansion villages never fully resolved the housing emergency.

So, in 1934 a competition was announced for the design of three council housing projects (via Vezza, via Scipione del Ferro and via De Crescenzi). These three public housing projects, built from 1934 to 1937, represent a unique example of urban design up to that time. Projects intercept all modern urban principles: the German inspiration for minimal housing and settlements with long, blocks and large windows to receive more sun and ventilation to improve hygiene and health standards. These interventions reflected public opinion of the time. In the April 1935, May 1937 and 1939 issues of the Magazine Bologna (the city's monthly magazine) published articles dedicated to the Case Popolarissime and their construction. From the literature of the time, it is clear that the building of the Case Popolarissime had not only the aim of guaranteeing disadvantaged people healthy and humane housing, but also of defining a green spatial context through which to develop urban and social regeneration policies. Inhabitants of the settlement, mainly workers in urban industries, had the opportunity to cultivate the green space between buildings, transforming the soil into an additional means of family sustenance (Della Rovere, 1937, 13).

This urban policy corresponds to a social strategy. The main goals of the project can be read in the Case Popolarissime article:

"It is not enough to produce a healthy house with a small plot of land, but it is necessary to ensure that the land itself is actually cultivated by the citizens so that they can derive the greatest material and moral benefit from it. Institutes' action must not stop at the simple handing over of the housing and land but must continue with all those forms of moral assistance that will be necessary for the integral achievement of the set economic, social and political goals." (Della Rovere, 1937).

Case Popolarissime and specifically Quadrilatero Malvasia follow a settlement layout of closed and self-sufficient wards,

with various shared services such as kindergarten, laundry, ward group and social control through a concierge. The formal and typological layout is developed through the succession of residential slats, alternating with empty spaces characterized by the presence of greenery. The residential volumes are open, develop in height and are positioned according to access to sunlight and fresh air and orientation criteria without so much attention to public space. In fact, the blocks are equidistant from each other and determine small open spaces between volumes that do not have a precise urban role (Fig.5).

In the mid-1950s Bologna experienced a second major urban expansion, following which the suburban landscape developed. The migratory flow towards the city is distributed in all areas of Bologna, but mostly in the areas of recent urbanization characterized by extensive building development, in favour of the new suburbs. In these years the bigger Ina-Casa neighbourhoods on the extreme eastern and western outskirts of the city were completed and the Plan for Popular Economic Housing (Piano per l'Edilizia Economica Popolare - PEEP) was adopted. During the Ina-Casa development some residential projects were realized in Bologna, including Quartiere Cavedone (1957-60, under the coordination of Leonardo Benevolo), Quartiere Barca (1957-62, under the direction of Giuseppe Vaccaro) and Quartiere Pilastro (PEEP, 1960-80, coordinated by Francesco Santini).

The Barca district is part of Bologna's western expansion plan, with an autonomous residential settlement for 40,000 people served by a series of infrastructures, including public buildings and a large riverside park along Reno (Fig.6). The articulation of district's public space has a precise composition. Inside the district, green areas serving the residential blocks are few and small, while on the fringes of the neighbourhood there is a very substantial network of open spaces, including the river

park in the western area along the Reno. There are therefore two types of open spaces: those directly serving the residents and those of a larger size, located on the fringes and usable by all the citizens of Bologna.

The district has a strongly unified and recognizable urban layout. Its composition rotates around a road axis which serves as the spine of the project and symbolizes the physical limit to the expansion of the city. The spine is characterized by the presence of a long residential volume, which follows the shape of the street and is called The Train. This is a building with a portico on the ground floor and two floors dedicated to housing. The presence of the portico testifies to the intention of linking the public space' architecture of the neighbourhood, and specifically the street, to the spatiality of the historical city of Bologna. The public space, barycentric to the district, develops on the opposite side of The Train, as a counterbalance to the large urban element but it is configured as a succession of squares connected to each other and defined by a series of collective buildings. The neighbourhood services consist of a civic centre, offices, cinema, church and market. In this way the urban space is also defined through The Train, which constitutes the fixed setting of the public spaces. The rest of the residential fabric of the neighbourhood is developed through a typological mix with high and low buildings (Fig.7).

These two Bolognese neighbourhoods, different in terms of historical period of their construction and dimension, urban and spatial characteristics, are both exemplary for investigating the crisis of public space in the contemporary city. Indeed, there are many points of tangency that can be discovered in these two very different realities. Both are peripheral residential housing with little connection to the historical city centre from an urban, social and cultural point of view. Both neighbourhoods are inhabited by a multicultural population that faces challenges in respect to integration.

Both neighbourhoods have been, and unfortunately still are, the scene of criminal activities that have increasingly led the municipality to monitor the local social dynamics. In both neighbourhoods, the FIU has carried out social and cultural integration activities, ensuring that these parts of the city would offer fertile ground for trialing possible innovative urban transformations, transferable to other parts of the city and other urban contexts, both national and international.

URBAN FURNITURE DESIGN LAB

The research was carried out during two project courses held in two different academic years. The working methodology was the same in both years while the place of analysis changed, the first year the Malvasia quadrilateral was investigated, while in the second year the Barca district was analysed. In the two years, a total of approximately one hundred students were involved, who developed 29 projects.

Collective didactic work has highlighted how urban furniture already present in urban spaces can be reimagined by enabling technologies. The common aim of these works has been to respond in an original way to specific questions

about the destination location. Design students were guided by lecturers in the conceptual development and design process. In detail, the projects respond to five specific thematic clusters: activation of relationships between people in the same space; relationship with urban fauna and flora; accessibility to the cultural dimensions of the city; support for a dimension of inhabited well-being; relationship between individual and community.

ACTIVATION OF RELATIONSHIPS BETWEEN PEOPLE IN THE SAME SPACE

Within this thematic cluster projects aim to generate situations that activate relationships among people in the public space. In the intervention sites, an evident disconnect in social connections between people of different groups in terms of age, social class, and cultural background was detected. The young designers imagined urban furniture that indicate, suggest or implicitly constrain specific multi-user behaviour. The Smatch project (Fig.8), by Raffaele Montemurro, Demetrio Paccamonti, Federico Piattellini, Francesco Scalise, and Francesco Vespasiano, is an example of this group of projects.

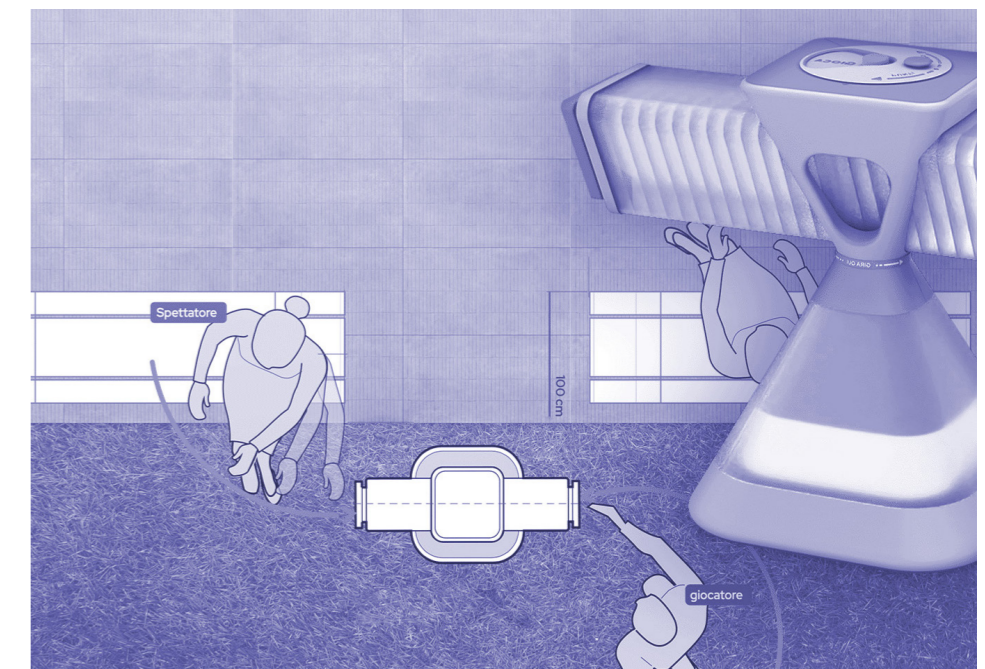


Fig.8 – Smatch project © R. Montemurro, D. Paccamonti, F. Piattellini, F. Scalise and F. Vespasiano.

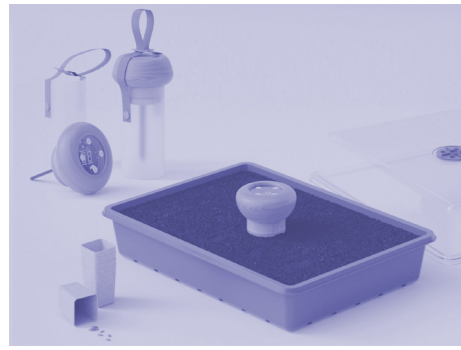


Fig.9 – Porcino project © C. Adinolfi, S. Bajramovic, M. Pilla and E. Zamagna.

RELATIONSHIP WITH URBAN FAUNA AND FLORA

Projects devoted to the relationship between people and other living species that inhabit the city belong to this thematic cluster. These species are often invisible and need design accents to be noticed. In addition, research has highlighted how design actions have the potential to educate citizens about the needs of other living beings.

One example is the Porcino project (Fig.9), by Carlo Adinolfi, Sonia Bajramovic, Martina Pilla, and Elia Zamagna. In this case, the designers developed an object that intervenes within the educational activities of the Barca neighbourhood elementary school. Porcino is a device that aims to introduce children to the care of the vegetable garden through monitoring and collecting data about the growing conditions of plants. The devices collect data from the soil that has previously been prepared by the students; the digital information is then annotated and observed over time and helps the teacher transmit knowledge about plant care.

The educational journey concludes with the transplanting of plants in the urban gardens within walking distance of the school. The Porcino device is a device capable of guiding both knowledge transmission activities and the relationship with plants in one's neighbourhood.

ACCESSIBILITY TO THE CULTURAL DIMENSIONS OF THE CITY

This cluster of projects aims to make the city's cultural offerings accessible to all its constituent communities. In contemporary cities, cultural experiences are not always supported by extensive communication between the various segments of the population. In addition, the city of Bologna offers several cultural routes through the Malvasia district. These paths are tours that connect several places in the city united by a common cultural topic. Within the district, however, these paths are not visible. To overcome these issues, designers Marco Binotto, Thomas Franzoni, Antonia Miraglia, Davide Nardi, and Lorenzo Pompeo designed an innovative type of digital Periscope



Fig.10 – Periscopio project © M. Binotto, T. Franzoni, A. Miraglia, D. Nardi and L. Pompeo.

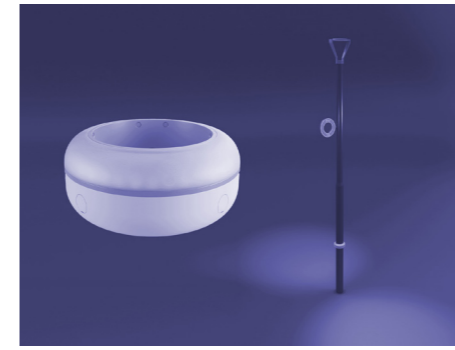


Fig.11 – AWAY Ring © L. Bettoni, M. Dall'Olio, C. Facondo, G. Iacovino and M. Salamina.

(Fig.10). The object is placed within the Malvasia Quadrilateral, tangent to the historic centre and node of multiple cultural routes. Its nine-meter height makes it stand out as a landmark (Lynch, 1960, 48) for people crossing space. Once the periscope is grasped by the side handles, it is possible to exert a rotational motion around the vertical axis of the object. Looking inside the periscope provides access to cultural information and real-time views of other points in the city connected by the cultural path.

SUPPORT FOR A DIMENSION OF INHABITED WELL-BEING

A central theme in contemporary cities is the dimension of well-being that citizens can experience through common spaces. The multiple air quality data collection stations in the city of Bologna show how outdoor activity is often characterized by the presence of natural and man-made dust. These dusts and particulate matter can preclude the use of space by individuals suffering from respiratory problems.

With these premises, AWAY Ring (Fig.11), the project of designers Luca Bettoni, Marco Dall'Olio, Christian Facondo, Giuseppe Iacovino and Mattia Salamina, was born. AWAY Ring is a wayfinding system that provides users with macro indications about the areas they are sensitive. The signage consists of hardware anchored to the existing network of street-lights and takes advantage of their electrical system. When users bring their phones close to the hardware, it will recognize the user's data and return directions to locations where there is a greater chance of breathing clean air. Based on the air quality, read in real time, the signs will attract citizens to parks within the Malvasia quadrangle or to neighbouring districts.

RELATIONSHIP BETWEEN INDIVIDUAL AND COMMUNITY

This last cluster of projects is dedicated to active community citizenship actions. Urban furniture devices can be active agents in supporting positive gestures by individual users; moreover, they can be vehicles for ecumenically representing the many distinct aspects of the community. Within this cluster, the Kindbox project was developed by designers Sara Battistini, Nicolò Castagnini, Giulia De Camillis, and Lavinia Marinelli (Fig.12). They propose a hub locker that allows the donation of multi-category objects to other residents of the Barca neighbourhood. The hub is located in a recess of a large apartment building which is little used despite being a possible junction point for local connections. The design of the hub includes a diffuse system of containers that make the area highly visible to the inhabitants. A play of warm lights and night lighting respond proportionally to the amount of kind donations that occur thanks to the service.



Fig.12 – Kindbox project © S. Battistini, N. Castagnini, G. De Camillis and L. Marinelli.

URBAN FURNITURE AS A THRESHOLD-BREAKING AGENT

The projects carried out during the two years of experimentation within the university laboratory showed how urban furniture, through the implementation of enabling technologies, can effectively act on the material and immaterial boundaries that the contemporary city often presents. In particular the scenarios explored by the designs revealed the ability to break three clusters of thresholds: that between relational boundaries, that between spatial boundaries, and that between informational boundaries.

From the relational perspective, the projects highlight some methodologies for connecting people who do not know each other, sometimes neighbours, with different ages or cultures. From the projects it emerges how the breaking of the relational threshold is often achieved through objects placed on blurred boundaries, spaces in which each person can pause and play different roles. The objects, implemented by the digital component, give the possibility of representing the other within a common space by giving them attention and dignity.

Projects also break the spatial threshold of a place, act in the shared spaces of the community and connect them with other places, proximal or distant, in time or space. The connections can be real, as with portals and walkways, or digital by crossing the connection of sounds and images in real time. The digital implementation of the proposed public space products gives perceptible features in the periphery of human attention in accordance with research on calm technologies (Case, 2016, 35) and 'ubiquitous computing'. These features allow people to be gently directed while leaving them autonomous in their movement in space. In these cases, objects are placed within specific perimeters and act to attract people to frequent the area.

Finally, many of the presented projects act on breaking the information threshold. These projects explore the ways through which to make some specific elements stand out over others in the spatial hierarchy of perception. Wayfinding and communicative tools capable of narrating the non-human forms of life present in space were investigated. Further projects have developed a narrative of data about distinct cultures of communities living in and traversing public space.

For multiple reasons many portions of the community are not visible in space and thus become difficult to recognize as part of the community. Some project actions were dedicated to communicating neighbourhood information in places outside the neighbourhood. Designers have designed objects that intercept people's curiosity along city paths.

Some projects aim to effectively communicate certain norms of behaviour. These norms are communicated across the multiple categories of users who experience the same space.

The alluvial diagram below (Fig.13) succinctly shows the plurality of designs that emerged from the experimentation. The intervention categories provided during the analysis phase as design channels were translated into a wide variability of urban furniture objects.

Through digital implementation, the three threshold clusters were explored with an equivalent number of projects. Each cluster corresponds to specific characteristics that define which threshold has been surpassed. From the graph it emerges how the lines of thought that guided the analysis phase have led to often different design paths.

Digital implementation has pushed the design to not necessarily follow a linear path and to propose objects that expand their responses beyond the traditional functionalities of urban furniture.

CONCLUSION

The results of the two-year experiment highlight how it is possible to imagine new scenarios from the redesign of classic street furniture through advanced digital implementation.

The presented projects demonstrate how this makes it possible to make traces of the actions, behaviours and dynamics that characterize the urban spaces visible.

The trace of digital data in the design product represents the object's rooting in the data-user-space relationship.

This enables new features to be added to objects that could be developed through a methodology focused on quantitative and qualitative reading of the pre-existing space. The scenarios that open from this design support the breaking of tangible and intangible boundaries inherent in the city.

The projects specifically address the need to act on relational, spatial and informational thresholds. Breaking thresholds through the placing of such urban furniture objects in empty urban spaces opens multiple research and design fronts for contemporary cities and the communities that inhabit them. Urban furniture for urban interactive spaces is thus a project area with broad prospects for growth.

However, there is a marked complexity in the design of these objects, in their maintenance over the long term, and in their financing.

The difficulties that follow from this complexity sometimes limit the design process; however, the design scenario phase that emerged through experimentation in the workshop shows clear fronts for innovation to support sociality, inclusion and participation in community life in community spaces.

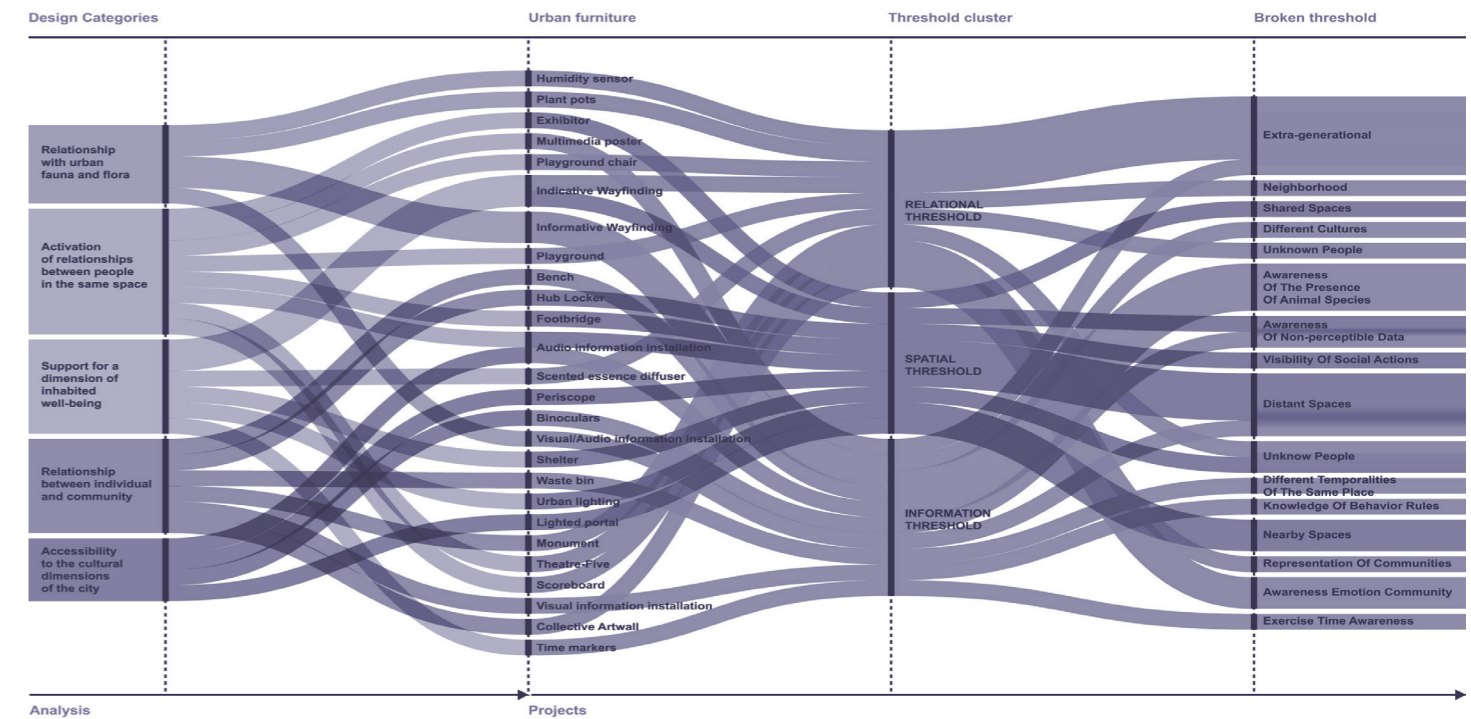


Fig.13 – Alluvial Diagram © Giorgio Dall'Osso.

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NOTES

1. The research, started in 2021, is dedicated to studying the urban phenomenon as a dynamic reality shaped by the mutual relationship and contamination between space, community, and digital data. The complexity of the subject has necessitated a transdisciplinary research structure, involving contributions from various design disciplines.

2. <https://www.studioidae.com/en/projets/aero-seine-2/>

3. <https://invivia.com/work/designing-city-for-emotions>

4. <https://rootoftwo.com/project/whithervanes/>

5. https://foxlin.com/portfolio_item/bubbles/

6. <https://calvium.com/resources/digital-placemaking/>