ENGAGING SPACES

How to increase social awareness
and human wellbeing through experience design

edited by Barbara Camocini, Annalisa Dominoni

D.I. **FrancoAngeli**
DESIGN INTERNATIONAL

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Cover image by Sara Sciannamè

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Foreword

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The book presents different perspectives of analysis and new models of experience, reconfirming the importance assigned to the wellbeing and human-centered approach, in the contemporary spatial design disciplinary debate. The pandemic and the return to a "post-pandemic new normal" have led us to further reflect on the spatial transformation and hybridization and their shared use in both the private and public spheres, exploring the importance of participatory and engaging strategies in the different phases of the design process with the aim to increase social awareness. The volume is divided into two parts described below.

The 1st part explores private and public space case studies introducing new hybrid co-living dimensions through the social engagement in "living communities" and reports participatory design approaches in the transformation processes of shared common spaces, such as schools, intended as incubators of social practices. Co-living spaces are constantly redefined by the relationships of their inhabitants. The co-existence of private and public spaces in this "domestic landscape" calls attention to the existing conceptions of "home" leading to new conceptions of "home" and "hybrid" typologies. Co-living interiors acquire new meanings and values in response to the social redefinition of family and friendships, as well as the inclusion of work activities in these domestic spaces. Social practices related to public spaces have increased in recent years, defining a process of urban regeneration. It is led by communities of users, starting from their needs, and related mainly to a combination of spaces and services. In particular, the focus is on the role of primary

and secondary schools in certain key areas of Milan, Turin and Padua to activate and facilitate new solutions through design.

Going in depth into the contents of each chapter, the authors of the first contribution "How to Live Together? Co-living for Future Dwelling" identify a growing need to build community within the domestic landscape of collective housing and focus on co-living and the components of space, furniture, and activities specifically charged with an understanding and intention to add value to the growing repertoire of designed communal and private spaces. Co-living and co-housing are ontologically opposed concepts. The two concepts are materialized into very distinct and differentiated inhabitation experiences with different configurations, products, and services, all leading to very differentiated community conceptualizations and designed configurations. Today we are witnessing an evolving redefinition or hybridization of concepts that influence the use and understanding of shared spaces and services. This evolving morphology is redefining the concepts of community, privacy, and publicness. The function of co-living is in a form of a regulatory structure where the inhabitants are not co-owners, but co-residents who absorb activities and services generally relegated to impersonal, third-party management, while sharing common spaces and maintaining relatively little private space. We define this as a hybrid living experience that gives more responsibility to the residents yet requires them to accept more public sharing and less private ownership. Designers recognize the benefits of co-living for an open, nomadic, and inclusive population, but promotion to a broader audience, such as those raising a family or the elderly, is needed to further educate and promote co-living as a viable housing option for people of all ages.

The second issue "Co-designing Public Spaces" concerns grassroots initiatives related to public spaces that have increased in recent years, defining a process of urban regeneration. It is led by communities of users, starting from their needs, and related mainly to a combination of spaces and services. The transformation of the city is sometimes temporary, related to occasional events or to figure out specific solutions (i.e. urban furnishing, tactical urbanism), to prototype and test scenarios and collect data and feedback to transform them into permanent design outputs. Designers usually take on the role of activators and facilitators, guiding the group of stakeholders in the process of defining what the solutions might be. The recent pandemic has radi-

cally changed many social habits and affected the economic situation, generating new needs related to proximity living (availability of goods and services at a medium-short range) and a widespread crisis in the employment market. Many of the responses being made to what people are now facing refer to the places where they live, work, and spend their leisure time and quality. Several examples show that today the neighborhood dimension in cities is the most promising and active concerning resilience solutions in social innovation. The perceived quality of neighborhood public spaces and services is significantly and positively associated with a sense of community and even the spatial layout and the functional mix could reinforce this connection. There is an undoubted advantage in involving local communities in the transformation processes of the spaces that animate their everyday life. Involvement leads to a greater sense of belonging to the result because it is considered as one's own and therefore is to be cared for, preserved, maintained, and somehow defended.

The 2nd part of the book describes more in-depth the experience of human beings in relation to physical and emotional aspects of space, focusing on the quality of the built environment that deeply affects people's wellbeing, social interaction, and cohesion, and investigating ephemeral practices and projects to experience design through a conscious sensorial approach. Built spaces do not create simple objects of visual seduction, they get into relation through the senses, convey meanings and memories. In collectively shaping the places where we live, it is essential to approach the built space from a holistic, humanistic, culture-centered point of view, responding not only to functional, technical and economic needs, but also to social and psychological needs.

The third chapter "Reusing the built space: atmosphere and human experience" explores how to reuse the built space increasing atmosphere and designing the human experience. We know that the quality of the built environment deeply affects people wellbeing, social interaction and cohesion, creativity and place attachment. Reversely, people's quality of life strongly affects their ecological relationship with places and the environment, influences the way they share emotions, experiences, needs and objectives. The sense of alienation we often experience in contemporary spaces, sometimes perceived as non-places, may be related to the weakness of their atmospheric quality, to a

lower impact on our memory and peripheral vision compared with historical and natural settings, which instead stimulate a stronger emotional involvement. In collectively shaping the places where we live, it is essential to approach the built space from a holistic, humanistic, culture-centered point of view, responding not only to functional, technical and economic needs, but also to social and psychological needs. Reuse design of urban abandoned spaces can allow people to benefit from memory, engaging atmospheres, and synesthetic experiences to prevent stress and restore attention, promoting urban regeneration and improving individual and community wellbeing. As designers, we have the tools to really look at ways to build a new sort of cultural ethos which is focused not so much on the object of architectural design (which of course has to be well built and nicely detailed and exquisitely conceived) but more focused on the human experience of what this built environment is.

The fourth contribution "Front door spaces. A time-based approach to the ground floor design" concerns contemporary city development, proposing a regeneration strategy centered on this volume's 'Engaging Spaces' theme. The authors illustrate the 'city of peaks' (of traffic, assemblages, ...), which manifested itself in all its urgency during the ongoing pandemic, and, as a paradox, the spread of urban empty spaces. To these observations, the authors add the impact of digital technology on the behavior of the inhabitants, which involves external pressure driving humans and making them move with pre-cognitive logics, with no randomness but causality, no proximity but intimacy. The front door city scenario described in the contribution introduces new city forms and tools, bringing forward new possibilities offered by the ground floors as places devoted to engaging people in their daily lives. The authors examine the potential of exploiting the porosity of built spaces through practices of temporal scheduling and space sharing, considering the city as a sponge with a new regeneration culture. Analyzing a range of proximity-centered strategies aligned with the principles of the city of 15 minutes, the contribution highlights the importance of slowness to sustain the natural times of a community, made of informal relationships, rituals, customs, to help build a physical relationship with places. Finally, the authors define some parameters of success for the front-door design approach identifying their impact on town spatial quality and people's physical and mental wellbeing.

The fifth issue "Experiential ways of mapping: revisiting the Desktop Walkthrough" intersects the "Engaging Spaces" theme from a perspective that studies how approaches, methods, and tools evolve embedded in the design practice, highlighting the importance of considering and documenting their historical origins and context of use. In particular, the contribution focuses on the Desktop Walkthrough tool, examining how, from being a prototyping tool, it evolved to be an exploring one, and then it showed an additional facet as a participative tool of the co-design practice. The discussion presents two examples of Desktop Walkthrough application in the educational experimentation that integrates spatial and service solutions, where service can help reshape spatial experiences and spaces are part of a service system to be designed for exploring and further developing research on the narrative dimension of the design process. Indeed, Desktop Walkthrough helped explore temporal, relational, and spatial design dimensions with an outstanding representational and visual role. The second case study explores the application of the Desktop Walkthrough tool as the front-end of the design process people's actions to drive the transformation of public spaces' new forms of mobility and interaction. In this case, therefore, Desktop Walkthrough assumes the function of participatory and co-design design tool and fosters designers' and non-designers' collaboration to generate ideas and insights.

Part I

Social design for engaging spaces

1. How to Live Together?
Co-living for Future Dwelling

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Abstract

This chapter distinguishes the differences between co-living and co-housing and focuses on co-living environments, which are based on the temporary sharing of spaces, services, and above all, experiences with building a community. Unlike co-housing, co-living spaces are constantly redefined by the relationships of their inhabitants. The co-existence of private and public spaces in this *domestic landscape* calls attention to the existing conceptions of *home* leading to new conceptions of *home* and *hybrid* typologies.

Co-living interiors acquire new meanings and values in response to the social redefinition of family and friendships, as well as the inclusion of work activities in these domestic spaces. Co-living is generally charged with the underlining objective of *building community*. New collective scenarios (both related to shared living and working) offer fresh and timely perspectives for designers to understand and consider the trending concepts of social engagement, social awareness, and human wellbeing in *living communities*.

The authors identify a growing need to build *community* within the domestic landscape of *collective housing* and focus on co-living and the components of space, furniture, and activities specifically charged with an understanding and intention to add value to the growing repertoire of designed communal and private spaces.

1.1 Communal and Private Residential Spaces

Co-living and co-housing are ontologically opposed concepts, and each of them materialize and crystalize their concepts into fully differentiated living experiences and configure different products, leading to also very different conceptualizations and configurations of communal and private residential spaces. In this chapter, the authors explore the difference between co-living and co-housing and focus on co-living environments. Unlike co-housing, co-living spaces are constantly redefined by the relationships of their inhabitants. The co-existence of private and public spaces in this *domestic landscape* calls attention to the existing conceptions of *home* leading to new conceptions of *home* and *hybrid* typologies.

Co-living is generally charged with the underlining objective of *building community.* New collective living scenarios will be explored to show how the concept has actively evolved in a fresh way. Designers will learn the importance of incorporating trending behavioral concepts of social engagement, social awareness, and human wellbeing in designed *living communities.*

In the following sections, the authors make an argument to respond to a growing need to build *community* within the domestic landscape of *collective housing* and focus on co-living and the components of space, furniture, and activities specifically charged with an understanding and intention to add value to the growing repertoire of designed communal and private spaces.

1.2 Collective Housing

The concept of collective housing, which reconciles communal and private spaces, has been experimented in the last centuries, particularly driven by housing projects that responded to an influx of workers who needed temporary housing during the Industrial Revolution, as well as the changes of social roles for civil coexistence among people who lived in multi-generational families or among strangers. We see this concept again, in the context of the Modern Movement, both in Europe (Choe, 1974) and in relation to Russian Constructivism (Benevolo, 1960).

In the twentieth century, experiences of collective housing that were created during the Modern Movement focused on privately owned dwellings in communal buildings, such as hotels, residential skyscrapers, and apartment buildings (Ballard, 2014). Whereas the public spaces were designed to function for a community of residents, they were in general, minimalistic, and not thoughtfully scaled to manage social or functional relationships among the residents or with the property management.

Italy, especially during the 60s, provides several notable collective housings of which, some highlight problems we may learn from. An example is the quarter ZEN (an acronym for Zona Espansione Nord) built in Palermo in 1969 under the design of architect Vittorio Gregotti. It was designed to address and solve social housing needs in the surrounding area but has sadly become a symbol of degradation and one of the most dangerous and crime ridden areas in the city.

A similar decline is visible in the *Vele di Scampia* (the *Sails of Scampia*) in the Neapolitan quarter Secondigliano, built between 1962 and 1975 under the design of architect Franz Di Salvo. The program aimed at creating a community among the users, with occupants living in small dwellings with many outdoor spaces that were supposed to be shared by the residents. The shared outdoor spaces were intended to facilitate human wellbeing and serve as socially engaging spaces. In the recent years, because of illegality, physical disrepair, and a long history of social decline, some of the buildings have been demolished.

Additionally, there is the kilometer long *Corviale* outside Rome, built in the '70s under the coordination of architect Mario Fiorentino. The scale of the building (986 meters long) and the number of inhabitants (4,500) were driven by a significant population increase of the region. It was supposed to be an innovative housing model with the integration of private spaces with collective activities. However, the project was not successful as a desired place to live.

These experiences have failed the main objectives of collective housing at its base, above all that of providing to inhabitants of economic-popular housing, a standard of housing quality better than many other similar realizations. Housing quality that resided above all in a correct relationship between public spaces and activities and private spaces and activities, but that, also because of the lack of realization or equipment especially in public spaces, building community

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has not been fully achieved. Add to this, the complexity of maintenance and management of these structures, for example with overly complex and expensive plant engineering equipment, but also with paths and common areas often oversized, then become the scene of episodes of petty crime, as also highlighted recently by literary and film episodes (Saviano, 2006).

Experiences, however distant in quality, even if ascribable to another example of an innovative housing model, can be seen in the design of Unité d'Habitation in Marseilles, France, built after the Second World War under the design of Le Corbusier. This example may represent one of the most qualitative and iconic examples in the field of *collective dwelling* born in the modern movement. Apart from that, it can be looked at as a *theoretical model* rather than a real and successful example of a positive way of living for many inhabitants in a right balance between public needs and areas and private ones. Furthermore, Le Corbusier tried, from a theoretical-experimental perspective, to resolve *real* problems related to living and to the relationships between residents, private spaces, and communal spaces.

In this example, furnishings played an important role in distinguishing and blurring private from public functions, and in the integration with the space and reduced surfaces, make these environments particularly *high quality*. In fact, we could say that one of the reasons for the failure of the proposals we examined earlier (the ZEN district, the Corviale and the Vele) also lies in having thought of private housing without considering the problem of adequate furnishing, which looked at unsuitable or conventional models because they were more in relation to the target users, both for economic reasons (high costs of custom-made furniture), but also for cultural reasons.

However, in relation to its importance as a *model* also declined in many other achievements, including those Italian previously exemplified, but not only, for the purposes of our dissertation on the collective housing in relation to new types that are emerging, and the role played by the design may be pertinent to analyze it in more detail.

Unité d'Habitation was conceived as a new mode of affordable or low-cost housing, completed in 1952, which resulted from a fresh look at the arrangement and use of communal and private space. The eighteen-story collective housing project was designed for a range of 1500 to 1700 users with an internal shopping street on the seventh floor

and a kindergarten and outdoor facility (jogging track and pool) on the roof terrace. The spatial living rooms in each unit served as the nucleus for the family that were open on two levels, with the parent's bedroom occupying the upper mezzanine above the living areas.

Significant at the time, the kitchens were equipped with modern amenities such as an electric stove, refrigerator, and storage units. The living spaces were largely transformable, able to adapt (to a degree) in both size and function. Throughout the apartment, storage was incorporated at nearly every conceivable opportunity. In addition, the units were mechanically supplied with clean air through the distribution of an autonomous and integrated air conditioning system.

These innovative and modern amenities, along with Corbusier's ideas about communal housing and communal living, which opposed de-urbanization, worked to create an integration of function and space. The program for the services of community drove the design and an aspiration for creating the garden city served as a basis for its *formal organization*. The downside lies in its success as an autonomous and self-sufficient community, disengaged from relations to the *outside world*.

These examples were all unsuccessful at achieving long-term, qualitative, and collective living experiences, even if they were conceived beyond traditional thinking of how to fit as many residents into a building as possible, with nothing more connecting them to one another and to place and time, other than through an address. They are indeed prime examples of how collective living can manifest less-than-ideal residential experiences for clusters of intermingled families and strangers. We argue that there are further and underexplored options that have the potential to *get it right*.

With the rise of modernism during the first two decades of the twenty-first century, we find a generation open to the possibilities that collective living offers, with some sense of communal enthusiasm absent from the aforementioned models.

1.3 New Ways of Living

Compared to the past, in relation to the processes of globalization that have been implemented since the 1990s (Branzi, 2006), the idea of living more "nomadically" (Elliot, Urry, 2013) has emerged as an

appealing way to live, no longer grounded to a singular place and an artifact *exclusive* for a very long period of one's life, as has happened for centuries in Western countries, and in particular, in Europe.

The ideas and concepts of collective housing and shared living have therefore become more *fragmented* and *mobile* (Elliot, Urry, 2013) in relation to the different phases of one's life. We start our life in a nested habitation created by our parents, and during our educational training period and career-building stages, we live in a series of co-habitation models (e.g., shared apartments or student housing). When we create our own nuclear family (i.e., marriage, partnership, or head of a household) we move to a habitation that represents stronger private relations and then, we finally move to another co-habitation model to support us when our physical and mental states make it difficult for us to manage ourselves.

People who are different from each other, or in different phases of their lives, have begun to feel the need to actualize their lifestyle following a model that is defined by phases of life and shaped by temporal relationships. What brings a newer twist to these patterns are the emerging processes of industrial clustering and technological innovation (mostly connected to the ICT phenomena) and the transformations of roles in the social exchanges, work, and family spheres. We identify examples of such trends that include:

- greater transformability;
- flexibility;
- multifunctionality;
- temporariness.

Temporal relationships and evolving roles in these areas (i.e., family, work, and society) have a profound influence in challenging traditional ways of living and models defined by phases of life. But also, we consider emerging new ways of working implemented by "knowledge workers" (Scullica, Schoonbrodt, 2009) that have opened opportunities and options for living, as work and private life blend.

These new ways of living have led to an epochal change in interpersonal relationships and in the relationships between individuals and spaces, whether they are focused on living or working activities (Piardi, Tieghi, Natile, 2012).

The academic and professional design communities are becoming more aware of the trend where people are seeking relationships outside of family, are more open to share lifestyle, and desire to be part of a community in a co-living environment, as evidenced from educational seminars in 2020 led by the Co-Liv Association at the School of Design, Politecnico di Milano. In particular, this seminar has given strong support to the research on the collective dwelling in the contemporary scenario, to the merging of new typologies (as the co-living ones) and to the relevance of interior and furniture design in their definition and process, going beyond a singular disciplinary approach or even a broader architectural approach. We now explore communal options for these trending interests.

1.3.1 Co-spaces for Living

As human beings, we all appreciate meaningful connections with others in shared spaces, as well as solitude and private spaces for ourselves. Both co-living and co-housing give opportunities for doing so, as the terms *co-living* and *co-housing* are nowadays indicating residential typologies that offer occupants private spaces, as well as the possibility to share communal spaces and services within a targeted group of people.

First, we should acknowledge that the two typologies we are referring to were born at different times: Co-housing already asserted itself towards the end of the last century, and was born in relation, also but not only, to the promotion of particularly sustainable lifestyles. Co-living spaces are examples of shared, collective living of more recent affirmation (the 10s of the current century) and present a greater relationship not only with residential typologies, to which co-housing refers above all, but also with hotel typologies, and, in the way in which spaces and services in common are often defined and treated, there is a strong secondary reference to co-working spaces, but also to those for entertainment, restaurant and cafeteria. It can be said, therefore, that the co-living structures that we are going to analyze represent in an emblematic way the polarity of "hybrid spaces", extending beyond the conventional typological distinctions of architectural matrix defined especially after the industrial revolution (Benevolo, 1964).

People may choose these two ways of living (co-housing and co-living) because they share common interests and intents that may be related to:

- economic necessity;
- quality of life;
- sustainability;
- the feeling of belonging to a community;
- seeking higher levels of quality in interior and furniture design, as well as in services in respect to the conventional residential typologies.

But differently from the past, these communities have chosen to live together beyond utopias (e.g., 19th century Phalanstere and Familistère), family ties (e.g., 12th century Tulou), religion (e.g., 18th century Shaker Villages) or traditions (e.g., 19th century Longhouses of the Native Americans).

In the research titled "Living Closer: The Many Faces of Co-housing" (Ahn, Tusinski, Treger, 2018) more concepts are listed that appear to fit both co-living and co-housing. These common notions and concepts include:

- slow living;
- lifestyle;
- mutual support;
- people over profit;
- collaboration over competition;
- spatial and social innovation;
- participatory;
- community-led;
- community-building.

According to these notions, both co-living and co-housing offer an idea of community based on the concept of sharing and collaboration over consumption. But if the purposes seem the same (i.e., share and collaborate and live close together with non-family members), the approaches to building and managing a *sense of community* are very different. Co-housers are people who have planned to live together in a shared community that was created from the very early stage by

them and that they all collaborate in managing, while co-livers enter a community which they have not designed or planned themselves and that they don't manage personally.

Another difference is related to the spatial organization of the residential spaces: while the apartments/houses in a co-housing feel very sheltered and personal, the ones in a co-living may look well-designed with trendy interiors and furniture but may not be personalized, missing the feeling of cosiness given by a private home. Despite these differences, both co-living and co-housing can offer solutions to supply the lack of human scale and loneliness that many people experience in big cities.

1.4 Co-housing: the Creation and Management of a Community and the Project of a Long-term, Collaborative Life

Co-housing is a typology of community-led residential settlement that includes privately owned houses with public communal spaces, designed for interaction and sharing. It is important to underline the idea that *co-housers do not only share spaces, but they share decisions as well, since co-housing is a self-managed community*. It may be inter-generational or focused on a specific target (i.e., designed for single parents, for people with disabilities, or for the elderly), therefore schemes vary from one co-housing model to another, but they can be designed so that the concepts of privacy and community are well balanced.

Co-housing arises from a small group of people (usually between 10 and 40) who choose each other and decide to finance a housing project focused on social interaction in accordance with shared values and needs. Co-housers are active participants in the creation of their community. Indeed, the main characteristic of a co-housing settlement is the fact that it is based on a collaborative design process, concerning both the building and the community, facilitated by experts who help the future co-housers select suitable typologies of spaces and services which will fit the characteristic needs of their community.

Following the Nordic co-housing model first developed in the 1970s, the most common architectural scheme includes private independent

housing units clustered around, behind, or aside a communal building where most of the shared spaces can be found.

These usually include:

- a common house (with a living room, a dining room, and a kitchen);
- guest rooms;
- both indoor and outdoor gathering spaces;
- a garden or terrace.

Other shared facilities may be included, depending on the typology of co-housers (e.g., fitness room, yoga room, kindergarten, art studio, workshops, reading rooms, etc.).

The entrance to private units usually takes place through the passage inside the communal building, that becomes a hall and, when the private units are grouped behind it, a windbreak (Field, 2004). This kind of scheme enhances the possibilities of meeting among the residents and can be found in recent examples such as New Ground Co-housing, located in Barnet, England, which can be considered a notable example. It is an L-shape building, with private units facing the streets and with the entrance through the common house in the corner.

New Ground Co-housing is a residential community for women over 50, who "agreed on values of respect and tolerance and mutual support, as well as a positive approach to ageing and care for the environment" (retrieved from www.owch.org.uk/about-cohousing, accessed 10th September 2021). Women of New Ground created the Association Older Women's Co-Housing (OWCH) and joined a partnership with Housing for Women and Hanover Housing Association, providing also social housing for women in need. New Ground was designed on the site of a former convent by Pollard Thomas Edwards, an English architecture firm specialized in the design of residential, public, and mixed-use buildings.

The firm guided the clients from the initial concept to the completion of their co-housing environment following the brief given by the women, aged between 50 to 87, that included private sustainable houses, with shared facilities for creating a sense of community. The complex includes:

- twenty-five customized private apartments with one, two, or three bedrooms, of which eight are either rented or socially managed by Housing for Women;
- a common house with a meeting room, kitchen, and dining areas;
- guest facilities;
- craft sheds;
- a large garden.

The clients also asked for proper spaces and facilities that could allow them to share caretakers in the future. New Ground shows that a co-housing development is a viable, long-term solution with the community at its center. It is important to note that the tenants are considered active members of the community – "not arisen from economic necessity but to forge alternative and more desirable ways to live" (Ahn, Tusinski, Treger, 2018).

The topic of sharing rituals and daily activities with others is very contemporary, as seen at the 17th Biennale in Venice, where the Nordic Pavilion had been transformed into a co-housing project by Helen & Hard, a Norwegian design practice. The proposal titled *What We Share* provided "a sustainable model for how to build a community and a living environment simultaneously, a place where inhabitants are shareholders and active agents for the development of their residence and what they share. It explores relations between the co-creation of a spatial, material and tectonic living environment, while giving rise to an awareness for what and how we want to share with one another" (retrieved from https://helenhard.no/work/venice-biennale/, accessed 25th January 2022).

The importance of the co-housing model lays in the opportunity of co-design and co-production of living environments that increase both the social and physical resilience. As underlined by Stephen Hill, Chair of UK Cohousing Network, "Co[-]housing is an opportunity to co-design a very different and necessary shared future. It is one of the few sources of housing innovation being driven by 'the customers'" (Jarvis *et al.*, 2016).

1.5 Access to a Community and the Sharing of Experiences and Lifestyle

As we have just introduced, co-living is a housing typology worthy to examine and better understand. It is a typology of residential settlements that includes fully furnished, private accommodation and communal spaces, designed for interaction and sharing. It is a form of shared living, not as permanent as co-housing, but rather temporary, offering a platform and a network for enhancing the sense of community.

Co-living arises from a developer looking for a property, defining its program and design, financing it, and managing it. People start entering the co-living when the development is ready, accessing a community which they have chosen, but not designed, and which they don't manage personally. This is a fundamental concept to co-living and distinct from co-housing. In fact, co-living and co-housing are ontologically opposed concepts. The two concepts are materialized into very distinct and differentiated inhabitation experiences with different configurations, products, and services, all leading to very differentiated community conceptualizations and designed configurations.

Furthermore, a co-living situation may join the living and the working spheres, especially when the target is young professionals and digital nomads. Indeed, some co-living settlements offer co-working spaces which may be shared both by the tenants and the neighborhood, therefore increasing the number of people participating in the community.

According to James Scott, chief operating officer of the co-living developer The Collective, "residents of co-living desire experiences over ownership, our mission is to build and activate spaces that foster human connection" (retrieved from www.thecollective.com/, accessed 15th June 2020). Indeed, co-living environments are designed to strengthen communities, minimize loneliness, highlight familiarity, and boost wellbeing.

Since the concept of community is stronger than the need of privacy, in co-living situations, the shared and communal areas take up more space compared to the private ones. A notable example is The Italian Building, a co-living property operated by Mason & Fifth, that occupies an Edwardian building located in London, which was redesigned by architects Stiff and Trevillion with interior designer Studio Clement.

This co-living arrangement provides:

- twenty-eight compact and fully furnished, private studio apartments equipped with bathroom and kitchenette;
- a spacious communal living room and dining room;
- workspaces;
- courtyard and outdoor terrace.

Lighting and furniture are supplied to the spaces and are an eclectic collection of antique, vintage, and high-street pieces to give the feeling of a place like home, despite the size of the studios. Furthermore, spaces are designed around the concepts of wellness (both mental and physical) and sustainability; natural, chemical-free, and reclaimed materials have been used in the entire space, following the guidelines of the WELL v2™, which defines the standards for human health and sustainable building.

Other co-living examples seem to be a cross between student housing and hotels, offering rooms in shared apartments with communal lounges, kitchens, and bathrooms. A relevant example is Flatmates, the first large-scale, co-living settlement in Paris, designed by Wilmotte & Associés Architectes with Cutwork, a design agency specialized in co-living and co-working. The client was STATION F, the world's largest start-up campus, who asked to provide a residential complex for 600 of their entrepreneurs focusing on the definition of the emerging community. Flatmates provides several communal spaces, including:

- a spacious lounge for socializing and where to cook together;
- a café;
- a bakery;
- a gym;
- a spa;
- a laundry room.

Tenants are housed in 100 apartments, each shared by 4 to 6 people, who have their private bedroom, a shared bathroom, a kitchen, and a living room. Cutwork, in charge of the interiors and furnishings, designed modular and flexible furniture that fit the concepts of sharing spaces and interaction (e.g., a sofa made up of nine different

elements that can be arranged according to various activities), following the idea that: "The way we live and work has changed. With our industrial technologies, we are reinventing classic pieces of furniture for emerging types of shared environments" (retrieved from https://cutworkstudio.com/flatmates, accessed 8th September 2021). This example shows the strong relationship between spaces and furniture, proposing products that can provide different solutions according to the new ways of living together. We will explore this concept later in the chapter.

Since one of the characteristics of co-living is *temporariness* (i.e., the stay can be from a single day to 2 years) some co-living differentiates the types of accommodation to better suit different lengths of stay. An example is Mokrin House (of Ideas), designed by Studio Autori with the digital nomad culture in mind. Located in the north of Serbia, it is intended for freelancers, entrepreneurs, and digital nomads on the move. It provides different types of accommodation that include:

- The dorm rooms: suited for small groups or for people on a budget, they offer 6 beds, individual closets, and shared bathrooms.
- The standard rooms: suited for one or two people, offering twin beds and private bathroom.
- The comfort rooms: suited for one person or a couple, they are more spacious and offer a double bed, a large private bathroom, mini bars, closets, and wardrobes.

Furthermore, Mokrin House is both a co-living environment, with shared spaces for residents (such as a movie room, a bio pool, a fitness room, a library) and co-working spaces, offering its facilities to locals, too. The main workspace is an open space on two levels, with movable workstations that allow for functionality and flexibility; indeed, the open space can be used as for individual work, for team meetings and for creative workshops. Mokrin House offers a "down to earth, nature-oriented work environment, to replace the stressful and busy urban business environment" (retrieved from www.mokrinhouse.com, accessed 8th September 2021).

The reduction of personal and private space in co-living shouldn't be seen just as an economic residential solution. Indeed, sharing spaces such as lounges, living rooms, and kitchens enrich that sense of

community that many people, of all ages are seeking. Differently from the past, there is a growing demand for co-spaces of any kind, be they co-housing, co-living, or co-working. "Sharing our living spaces doesn't have to mean compromising privacy, comfort, or possessions; it can actually offer us greater choice and flexibility, allowing us to live more efficiently, healthily, and sustainably" (Frearson, 2021).

1.5.1 Co-Living as a Typology of Community

One of the fundamental elements defining co-living developments is the idea of building community in which the structure, its spaces, services, furnishing elements, technologies, and the aesthetic-communicative design style are interconnected and communally accepted. Core to co-living is the concept of building a community. Once part of a co-living, residents participate in the completion of that specific community.

From this perspective, the community of a co-living is based on a series of accepted values, choices, or orientations, but also objectives common to a group of people pertaining to different dimensions of life. Examples of shared values include:

- work;
- health and wellness;
- ethics;
- leisure;
- care for the environment and global sustainability;
- preference for certain events and cultural movements;
- personalities;
- even in territories of the imagination.

All these become attractive factors that can bind more people together who decide to stay in that structure, not only because it provides a certain type of space or services in relation to precise economic thresholds, but because each resident feels part of *something more* (i.e., an inclusive community) in which to identify, belong, and share.

Certainly, building a community, like in a co-housing and having a community experience, like in a co-living, must be reconciled with an

appropriate balance between public and private spaces and activities. As we have analyzed in the beginning of this essay, examples of collective living from the past have often failed in this effort because there had been a disproportionally large sense of community due to scale, location, proximity, and its emphasis of public setting functions and activities, have often compromised the need and desire for individual privacy and safety.

In this sense, interior designers, architects, furniture and product designers have a great responsibility in configuring co-living solutions that place the individual's needs in priority within the co-living structure being designed. It seems clear that the "sense of community" is built by the proper design of shared spaces (Elgani, 2019).

These shared spaces include:

- living areas;
- working areas;
- studying areas;
- entertainment areas;
- multipurpose lounges;
- spaces of preparation and consumption of meals.

It is also very important to include a *sense of privacy* in the design of furniture in both public spaces and private spaces. The ability to achieve this indicates the success of the hybridization of the design. As an example, students at the School of Design of Politecnico di Milano were challenged to resolve how spaces and furnishings perform both as public and as private spaces, considering issues related to using space for both purposes. Students discovered how to limit the numbers of people for certain activities, how to combine spaces from many to one or vice versa, and how to design furniture and spaces needed for specialized activities, converting them from public to private, or from singular to multi-use.

If the co-living community has a common and fundamental theme, such as "wellbeing" then it must also be included as a value statement for the structure's design when defining areas for relaxation or personal care, both public and private. Co-living is life enhancing for residents since it facilitates social interactions, promotes wellness, and can reduce

living expenses through the sharing of spaces, furniture, services, and when possible, through economy of scale.

Today we are witnessing an evolving redefinition or *hybridization* of concepts that influence the use and understanding of shared spaces and services. This evolving morphology is redefining the concepts of community, privacy, and publicness.

1.5.2 Co-living as a Hybrid Model

The hybridization of public and private space and of functions (e.g., living and working) finds its roots in the contemporary society that values wellness, multifunctionality, and mobility. People find themselves living a nomadic life, temporarily situated in place and time, and owning few possessions, or bringing with them few possessions from place to place.

The function of co-living is in a form of a regulatory structure where the inhabitants are not co-owners, but co-residents who absorb activities and services generally relegated to impersonal, third-party management, while sharing common spaces and maintaining relatively little private space. We define this as a *hybrid living experience* that gives more responsibility to the residents yet requires them to accept more public sharing and less private ownership.

The temporal nature of this experience indicates a more transient, or nomadic pattern from people who phase in and out of the co-living community. In the modern definition, it is like living out of a suitcase, but entering a safe space fully equipped with all the conveniences of home and of services shared with others, such as gardens or gyms. Indeed, this model is indicative of the hybridization rooted in the late industrial era with the phenomenon of housing re-use in alternative places far from the tenant's home (De Masi, 1985). But the difference in models is from the function of 're-use'. While re-use in the former model related strictly to the bedroom occupied by different boarders or tenants, the concept of adapting re-use in the co-living model has given rise to considerable experimentation and updating of spaces for living and working such as WeWork offices (Camocini, 2016).

1.6 Socialization and Society

The first experiences we have as human beings are related to the space and objects that we first explored around us, and these memories remain with us, despite our growth and the inclusion in our knowledge of culture. The formation of our initial living and working experiences, bear witness to new relationships with objects and spaces, as experienced during the Corona virus pandemic.

Indeed, with the health emergency of 2020 and the consequent reduction of social and individual mobility, the daily and routine activities within the domestic landscape have become amplified in our lives and are a source of consideration and reflection about the internal and external living places of our homes. Among the many routines and recurring activities of daily life in the domestic landscape, we consider and highlight even the most mundane:

- collecting mail;
- recycling and throwing away the trash;
- locking and unlocking doors and bikes;
- opening windows for ventilation;
- filling the fridge and pantry;
- emptying the distiller;
- cleaning the floors, furnishings, and the toilets;
- working on the lawn or garden;
- turning on and off the lights;
- feeding and in some cases, walking the pets;
- preparing meals and cleaning the dishes;
- shopping;
- laundry.

Some communal needs and desires that result by the forced sharing of domestic spaces and activities have shown, in many of our homes, an inability to deal with changes that have sometimes presented themselves as a problem or only as a normality not fully contemplated. Through such transitions, we have rediscovered underutilized *niches and corners* within our home, invented new uses for products and spaces, and created innovative solutions for better flexibility in domestic spaces.

It is not difficult to imagine that the synthetic and virtual dimensions in how we have grown accustomed to communicating recently will produce more and more individual abilities aimed at orienting our mind and our senses towards more autonomous and virtual habitats, progressively more personal and more unrelated to the constraints of physical and spatial perceptual experiences. Regarding the breadth and scale of new emerging Internet of Things (IoT) and digital tools and services, we can assume these digital tools and product services will have a widespread and global significance in how we communicate, work, play, and socialize.

Structuring the often silent or hidden language of a new mode of communicating with one another (proxemics), discovering the parameters that promote a new way of living and new experiences has been, and continues to increasingly be, the task entrusted to current and future generations, who begin to orient and navigate themselves through a new complexity of digital and virtual signs, referents, and meanings.

The design of spaces and furnishings can significantly transform social processes at the service of the community, and in the process, design can serve to educate new ways of discovering and communicating through spaces for a contemporary hierarchy of non-induced social needs. In this direction, we can see a continuous increase in co-living activities which is aimed at the interpretation of many, currently "mixed" lifestyles in which the spatial and conceptual boundaries between work, study, leisure, and play are vanishing. We believe that co-living can respond to many different physical, spatial, and emotional needs through the design and inclusion of hospitality, social areas, and community building activities.

1.6.1 *Private as Personal and Public as Communal Space*

The investigation into the concept of hierarchical dissolution between public and private spaces initially materialized in the realization of the concept of "free flow movement patterns in workplaces" (i.e., the interior workplaces of Microsoft and Google). The application of hierarchical dissolution between communal and private spaces has brought offices closer to the concept of home, working closer to themes of domesticity, such as free, personal choice of place and a way of working within and between communal and private activities and spaces.

Similar concepts have been applied to the communal living spaces in many co-living developments. Not only does the border between private and public (i.e., personal, and communal) spaces shift continuously in co-living, but the oppositions between these two terms become complicated when they interfere with other antitheses, such as those of the collective and the individual, the spectacular and the intimate. Teyssot (1986) explains that borders between private and public spaces shift continuously, particularly when sub-themes of opposition enter the equation.

The oppositions between private and public, the individual and the community, and between small and large are not necessarily a struggle but come from a cultural and societal hierarchy that established distinct functional relationships between different rooms of the house, where space is normalized by use and its users. Co-living respects the functionality of space as a place for socialization. This is an important concept to highlight.

The disciplines of both Interior Design and Product Design have begun to take on design-development leadership in the somewhat generalized standardization of the *architecture of the house* and its logic or rationale used in the design or planning of the typical floor layout. Consequently, many designers are expanding and shifting their traditional concern for the aesthetic of the object to embrace also a concern for the aesthetic of the uses to which the object will be put (Ambasz, 1972). The concept of space can be extended by integrating the activity of users into its conception, as in the concept of *Activity Space*.

1.6.2 Activity Space

The notion of *Activity Space* (the space of activity) is an evolving and challenging concept. According to Massey and Jess,

If we think about space as a place of extended social relations, then perhaps we need to rethink our concept of place, debating our representation of it as coherent, limited, and stable. One approach to this question in a systematic way, is thinking about the "space of activity" of different phenomena. The space of activity, meaning the spatial network of links and activities of spatial connections and locations, within which someone acting oper-

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ates. The notion of activity space is not a precise theoretical concept… It is rather a "heuristic device" (a useful tool) that helps us to enter into a special way of thinking about the spatial organization of society (Massey, Jess, 2001).

Domesticity is connected to hospitality, not as a development of a division of equal spaces in hotels (as in the 1950s or the following differentiation of the hotel in boutique hotels), but as a subsequent step, about the restoring of the relationships that develop at home and the relationships that are established between family members or friends, modifying not the private rooms, but the common spaces that grow and join some new areas. The new co-space solutions of co-housing, co-living, and co-working respond to new trends of lifestyle and social behavior, resulting in the optimization of:

- sharing spaces;
- reducing ownings;
- reducing expenses;
- living communally among individuals not belonging to the same family.

These accommodations interpret this change as an aspect of sharing spaces, furnishings, experiences, activities, and relationships, as a lifestyle and social behavior, trying to balance sharing communal activities and isolating oneself for individual needs and desires for privacy in the same place. It starts from understanding real living and the activities and needs of our daily life to arrive at the theorization and resolution of architecture, spaces, and furnishings.

1.7 Co-living Spaces

Why is there discussion now about co-living and why is there such broad interest in the topic? One answer stems out from a complexity of urbanization, affordability, and a growing loneliness epidemic. According to the 2018 Revision of the World Urbanization Prospects, published by the Population Division of the United Nations Department of Economic and Social Affairs (UN DESA), 55% of the global population lives in cities and by 2050, estimates there will be 68% of the

global population living in cities. Regarding the issue of affordability, 40-50% of residence are cost burdened (UN News, May 16, 2018). Many people simply can't afford to rent or purchase their first home. And loneliness is a growing condition that needs to be addressed.

Apart from these reasons, mainly of an economic nature, as was already "predicted" by the distant archetypal experiences (both those generated by the utopians and those generated within the modern movement), it will no longer be globally sustainable (with reference to the environment, social structure, economy, etc.) to have an exclusive space (residential or multi-residential) for unlimited use by a person, a couple (partner) or a family unit (traditional or single parent). The *sharing* and the *flexibility* of use also in relation to different periods of one's existence and different needs (as stated at the beginning of this section: family life, student life, couple life, retired and elderly people's life again) will aim at spreading more and more these new *hybrid* forms of temporary residence. The design beyond the areas of interior and furniture design, but also as a discipline *bridge* between different knowledge areas (i.e., anthropology, sociology, economics, technology, etc.) is then called upon to play a key role in defining these new scenarios for contemporary and future living, focusing, and safeguarding the individual his physical, psychological, relational needs, … whether they are more of a matrix composed of individual and / or collective subset groups.

Looking specifically to some special buildings as relevant examples dedicated to co-living, we notice how they have ranged in size from 16,000 sqm and 500 microunits as is the case of The Collective Old Oak in London, to the 4 rooms for 21 residents of the Nest Copenhagen, or the 16 residents of Sun and Co, located in Javea Spain, which was the recipient of *Best Co-living Community of the Year* at the 2021 edition of the Coliving Awards (see Figure 1).

A duality can be noted in different scales of spatial realization. At the personal scale, the building is designed to safeguard privacy, space, and individual rhythms of daily activities, while the public domain allows for the spontaneous formation of groups around shared and common spaces, such as kitchens and dining rooms. The nucleus of people is the key to the formation and maintenance of the community. The housing units have a variability of capacity and size in relation to the building, from large to small buildings in different typologies from areas of the city to rural buildings in the suburbs or countryside.

Fig. 1 – Residents at a community gathering at Sun and Co in Javea, Spain. https://sun-and-co.com/ © Sun and Co, Javea, Spain.

Generally, the bedroom and private spaces are composed by single or shared sleeping units and contain, as single units, a somewhat limited amount of private space from 12 sqm with a bedroom, bunk beds, a study corner, an ensuite bedroom, sometimes a kitchenette, and a small dining space or a small living area. Internal spaces are often organized off an internal corridor to access the bed, a corridor that is re-evaluated and used not only as a passage. On a large scale, the building tries to open itself to allow users to experience nature using *internal landscapes*, reproducing moods, atmospheres, elements of cities and activities.

The nature of these spaces and their arrangement and distribution in the buildings are important to allow unexpected encounters between inhabitants through designs that foster socialization. The residential component of the building is flanked by co-working spaces that encourage socialization through exchanges.

Public spaces offer activities, events, and themed services such as cooking, sport, yoga, music, dance, painting, animation, workshops that help characterize co-living to be able to cover different target groups and determine the choice by co-livers.

This is another strong point of co-living: an inhabitant can find accommodation and social inclusion based on his or her passions or

areas of interest. The nature of these social places, their arrangement and distribution throughout the building, is perhaps the most important consideration of this new typology.

All is not always positive, however. For someone in co-living, there is the danger of isolation for possible lack of social connections and for its extroverted design that can lead to the creation of «privileged islands». Dagnino is wise to warn that, "the very serious risk that must be prevented is that the enclaves (the Co-living) become closed, selective, or folded in on themselves" (Dagnino, 1996). Designers of such spaces have multiple approaches they can adopt to improve a sense of wellbeing in co-living spaces.

Spaces for communal activities and work can become both elements of necessity for non-resident temporary visitors, as well as places of reference, cultural, and social exchange among the inhabitants of the neighborhoods. Through these places of temporary and shared activities, a typology is being connoted as *the co-living type*, not as a typology of space but as a social scheme that admits a whole variety of possible formal variants, a working process that arises from research and on which the subsequent design process will be developed.

Co-living as a social typology, interprets a habitat with its own internal building structure and the concepts of equipment and furnishings stem from a deconstruction of more traditional apartments. Elements and strategies are often tethered to the promotion of community and social life.

The categorization of the elements directly aligned to the promotion of social life is not necessarily a guarantee of good social relations, nor necessarily a guarantee of building community, even if it can help. Hierarchy and cataloguing guarantee a structured and orderly social organization, but relationships and shared experiences promote the sense of community and require connections that must be maintained between people, even if they are different from each other.

To help maintain motivation, promote community building, and motivate human and emotional responses, both interior spaces and products must be considered as the relationships that will affect the individual as well as the collective community. A space as a place of life and domestic landscape, a space as a place of identity and memory and of self-care are important concepts to consider in the design of co-living spaces. As we know, spaces become *places* with meaning

embedded through use, place, and time. Therefore, relationships correspond to spaces that allow activities to directly involve people, space, objects, technologies, and the environment.

1.7.1 Furniture and Co-living Spaces

The history of architecture and interior design has explored domestic spaces and workspaces in many ways, studying the relationships between space, millwork, furniture, and equipment developing types and models that evolve according to changes in lifestyles as well as in response to evolving technologies. In the School of Design at The Politecnico di Milano, interior design and product design students (in the frame of the Final Syntesis Design Studio I3/P6, A.A. 2020-21; Faculty: F. Scullica, J. Postell, R. Mangiarotti, M.A. Borella, G. Veronese) have explored and discovered innovative solutions to the subject of multi-use and multi-function in both co-working and co-living. This didactic learning experience explored how interior space and furniture design can give appropriate answers (solutions) to these new typologies of neo-residential spaces (the co-living ones) according to their users and inhabitants' needs, looking to the new ways of "living, working, and travelling" (Scullica, Elgani, 2019) in the contemporary scenario.

We present a point of view that considers scenarios regarding the significance of domestic space and furniture as being dependent and responsive to communal living trends. Furniture that is designed as modular, multi-functional, easily movable, and transformable can fit best in the co-living, co-housing, co-working environments.

Consider for example, the worktable as a possible extension of the dining table (or vice versa). Although these distinct tables (working and dining) are parred with specific and distinct activities and conventionally intertwined with specific areas or *rooms* in the home, they are, through many cases and in many scenarios, often one in the same. This creates a blurred division in the furniture that is shared between the activities of working and eating and further blurring regarding the notion of space used for different functions and human activities.

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Such scenarios are often driven by limited space, limited furniture, and or limited resources. In a society where one must work at home or work in a shared co-living, the culture of food and the communal rituals tethered to the meal should not be lost. Following, in figures 2, 3 and 4, we see an early schematic, storyboard, and developed rendering of an innovative design solution where the worktable can transform into a dining table and dining table back to the worktable. The project shows the potential for furniture to address multi-use activities when the limits of space and the limits of furniture prohibit single use solutions.

When designing multifunctional furniture for smaller, private spaces, it is important to carefully consider how they can affect behavior and wellbeing through daily use. According to Giulia Senni, a graduate of interior design at the Politecnico di Milano,

Our homes are becoming smaller and consequently consisting of multi-purpose spaces. In this context, the boundaries between the activities carried out in these spaces become fluid. Thus, it is essential to design multifunctional furniture to give the possibility to separate these activities and preserve our daily rituals – such as the food one – as well as to maintain our physical and mental wellbeing.

Fig. 2 – Early concept sketches of the Chrysalis Working-Eating Table, 2020-21 thesis. Politechnico di Milano, 3rd year interior design student Giulia Senni. Drawings and design by Giulia Senni.

Fig. 3 – Storyboard of the Chrysalis Working-Eating Table, 2020-21 thesis. 3rd year interior design student Giulia Senni. Drawings and design by Giulia Senni.

Fig. 4 – Digital Renderings of the Chrysalis Working-Eating table in different configurations, 2020-21 thesis, interior design, Giulia Senni. Drawing and design by Giulia Senni.

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In both our academic and professional institutions, students and designers explore solutions and strategies for *making place* for distinct activities (i.e., eating, working, studying, playing) that rely more on the furniture and equipment for the activities and user needs rather than a reliance solely upon the space itself. So often the case, design solutions are multifunctional, and very often, transformative (see Fig. 4).

Today, thanks to an eruption of emerging new digital and IoT technologies, the worktable not only can support, but can also be transformed into a virtual screen, like a desktop monitor or mobile phone that creates an immersive digital environment, an environment that abolishes the physical and spatial limits or constraints of living or working spaces in the house (see Fig. 5).

This example demonstrates the current design practice to identify solutions for situations where private and social encounters become blurred within existing spaces. A table can become a tablet and a guard-rail can become a place to work. These ideas of transitional design,

Fig. 5 – Example of a worktable adopting digital and IoT technologies. Design by Politecnico di Milano students: Sara Ubertosi, Interior Design, Luca Riva, Product Design, Leon Bora Yegenoglu, Product Design, & Ines Chillemi, Interior Design. Interdisciplinary LSF NEW SPACES NEW FURNITURE, 2020-21.

extend spatial and systemic notions about place and space and cause us to re-examine the social and functional actions in how people live and work. We believe designed furniture can address those blurred interactions, especially experienced in the co-living or co-working lifestyles.

Recently, we can see a new approach to domesticity in co-living and co-working environments. We talk about vital centers within domesticity, where, for example, the space dedicated to the preparation and consumption of food is highly socialized and public. The kitchen of today is a space where you spend time with others and where food has a value: the notion of a meal, and including its preparation, consumption, and clean-up are all means of socialization.

In co-living, the design of open spaces and the choice of flexible furniture, such as tables, chairs, and modular sofa components that can be used in different common contexts, marks a new dimension of the "domestic" space. In this context, concepts of modularity emerge and set the stage for more systemic design approaches to furniture solutions in which the equipment and interior millwork share and help to make spatially blurred boundaries in terms of flexible use and shared components. Such products often can adapt to a wide range of spatial typologies. Those with open system platforms are designed and produced to work with several other accessories and product solutions, typically produced by other companies.

The spatial arrangement of furniture in co-living spaces can be designed to influence the behavior and psychological wellbeing of its users. An example is the original table combining the personal and the social use by Achille Castiglioni for the XVII Triennale exhibition, which the same author describes as:

… in short, the project of a device for satisfying one or more individual behaviors and their free aggregation independently from space constraints. The resulting multi-functionality is not related to necessity, but the proposal of a substantial facility in exercising the freedom of choice of personal behavior… and regenerates a minimal structure of relationships between housing behaviors (Castiglioni, 1986).

Or also, the concept of Cini Boeri's project *The Size of Household*, in which "the proposals that have emerged, or we hope will emerge, see in the couple life's the meet between two distinct autonomies which, instead of canceling each other, reinforces diversity in their encounter" (Boeri, 1986). Both quotes address an idea that designers have long

acknowledged; *the necessity of furniture and equipment to complete and complement interior space.*

1.7.2 Vertical and Horizontal

Furniture in co-living spaces becomes critical for the creation of balance between the sense of building community and that of enabling individual privacy. Indeed, in order to understand this better, we can consider organizing *furniture* into two typological categories, *horizontal* and *vertical*. Vertical furniture tends to partition, divide, or isolate users

Fig. 6   Fig. 7

Figs. 6 and 7 (above) – A vertical unit, Bacco can be positioned where needed to partition space. Retractable components (Baccanti) can be used as seating or modular furniture to bring people together as well as a screen to separate or divide activities and users. Bacco is made of sound absorbing material. Design by Politecnico di Milano students: Antonio Aquaviva, interior design, Diego Casazza, product design, Giuseppe Medaglia, product design, Sara Pedranzini, interior design. Interdisciplinary LSF NEW SPACES NEW FURNITURE, 2020-21.

Fig. 8 – Plan of co-living scheme for 2-4 people, called "side by side". The Vertical units located in the middle of the space can move creating a transformable and temporal division between the two spaces. Design by Politecnico di Milano students: Antonio Aquaviva, interior design, Diego Casazza, product design, Giuseppe Medaglia, product design, Sara Pedranzini, interior design. Interdisciplinary LSF NEW SPACES NEW FURNITURE, 2020-21.

and interior space, dependent upon its location in space, while horizontal furnishings tend to bring people together, creating a sense of community and opportunities of sharing. In fact, in co-living experiences, horizontal surfaces (e.g., tables, counters, and shelving of any type) are an important feature serving as functioning equipment for common activities and spaces.

At the same time, as private spaces in co-livings are relatively smaller than in traditional dwelling spaces, the need for versatile, modular, and multifunctional furniture and accessories is greater. The growing need for inclusion of shared communal activities and private individual experiences along with the need and desire for flexibility and transformability of furniture and equipment in relatively small domestic spaces are important aspects to consider throughout the design process. The notion of vertical and horizontal products and furnishings is an important way of thinking about furniture in that the application of the concept can help users adapt to different and unexpected situations Considering horizontality and verticality in the conception of furniture design can help set a stage for multi-functional use and multifaceted activities. In addition, there remain several peculiar features or highly desired characteristics sought in the design and production of furniture today, which include:

- sustainability and environmental considerations;
- ergonomics and inclusive use(s);
- health, safety, and welfare;

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- durability, both of furniture and of the materials that furniture and products are made of;
- repurposing, repairing, and recycling;
- the ease of cleaning and maintenance.

One of the problems of furnishing solutions for co-living is that in every case, furniture needs to be adaptable to the space and supportive to the behaviors and activities of its users. This thought underscores the following concept. "Furniture design is deeply rooted in the human condition. It is a social science that belongs to the humanities, an applied art that draws upon many design fields, and a tangible reality that relies upon a working knowledge of materials and fabrication techniques" (Postell, 2012). We can think of examples of furniture and equipment, specially designed to enhance the fundamental elements and specifically, users of the co-living.

Currently, relatively few furniture manufacturers are interested in co-living as a specific, stand-alone type of social environment, but some furniture companies are starting a new trend that has unique potential for development and maximizing good design that meets the evolving needs in co-living. The trend of co-living is so important that some furniture companies are starting to create a special line, aimed at student dormitories and shared domestic spaces using a synthesis of simple, functional, and affordable products that Millennials and Generation Z demand. Another future has just begun.

This new trend can certainly help shape the co-living environment because it is addressing new generational users, flexibility of purpose, nomadic lifestyles, the desire for wellness, and community. In these values, the design of space, furniture, equipment, and millwork all share important roles to deliver new solutions and strategies and serve how we might rethink the evolving domestic landscape today driven in part by the role co-living plays in the housing sector.

1.7.3 New Frontiers of Co-living: Private, Public & Hybrid Uses

At the base of the typology of co-living, there has been for several years now consideration of a new relationship between public and private spaces, between activities and services enjoyed in public, and

activities and services enjoyed in private, a contrast that appears to be at the base of the identity of temporary collective living facilities – i.e., hotels, motels, resorts, vacation villages (Scullica, 2000; Scullica, Del Zanna, Fossati, 2012).

Bruglieri's research has identified the significance of social networks and a shared economy (Bruglieri, 2018), and has placed emphasis on the choices and lifestyles of young consumers which have led to a new way of enjoying the public-private relationship that has had, and is having, increasingly multiple consequences in the definition of new systems of services and spaces. Sharing spaces, services, and activities seems to reflect new behaviors in the name of social inclusion, but also of sustainability on a broad spectrum (social, economic, environmental).

The Millennials (those born between the years 1980-1995) and Generation Z (those born between the years 1997-2012) are more open and inclusive in what is described as "new informality "resulting in more free, inclusive, "eclectic" codes of behavior in a very broad sense, which have already led to the emergence of new types of hospitality systems such as student hotels and design-hostels (Scullica, Elgani, 2014). These new formats have profoundly changed the architecture, the spatial identity, and the functions of many facilities, not only in the tourist accommodation sector, but also in work or office spaces in which a new balance between public activities and services and private activities and services is increasingly showing an improvement in the means of general comfort of users and workers.

On the other hand, it is not by chance that both accommodation facilities and workspaces are the basis of the typology of co-living spaces, especially those in which the necessity of carrying out tech and related work activities appears to be a distinctive feature (as seen during the seminars held by the Co-Liv Association at the School of Design of the Politecnico di Milano). In fact, adequately balancing public and private spaces and activities according to the+ new needs of an evolving user base, appears to be an important topic, which must be carefully conceived, designed, rethought, and remodeled, including the paradigm of flexibility, multi-use, wellness, and concepts of private and communal spaces.

Concepts of convenience and cost savings, and the need for flexibility have driven pre-pandemic interest in co-living. But the impact of the recent pandemic on co-spaces is not completely clear yet. Some

co-live companies have not made it through the pandemic, while others have reduced and limited occupancy. It seems that the pandemic has caused a larger demand for co-living resources but has also resulted in some closures and some loss of clients. To underline and quantify the changes in spaces and services of co-living due to Covid, we need to focus on recent efforts in co-living that address social engagement, wellness, and prevention of loneliness. According to the Dutch publication Coliving Insights, that releases quarterly publications exploring innovative initiatives regarding co-living sector, "overall, the co-living movement has proved it is here to stay" (Chicago Tribune Publishing Company, July 9, 2020).

1.8 Conclusion

We have attempted to explore ontological distinctions between co-living and co-housing experiences, identifying shared themes and qualities that people are attracted to, specifically in the co-living model. Product and interior designers are particularly well-poised to enhance the experiences of co-living by thoughtfully and faithfully creating spaces, products, and furniture suitable for flexible, multi-functional, and multiuse solutions, that improve the lifestyle and wellbeing of residents as they fluidly move between the public and the private spaces. We encourage the inclusion of content that indicates furniture's important role in making co-living/co-working environments successful. More research conducted will improve design applications.

New hybrid models of co-living, being the result of unconventional logics and in relation to different components compared to the most consolidated types of hospitality or living, become deeply "human centered", "inclusive", and strongly inclined towards the motivation for the "design for all" typology (Accolla, 2009). It is imperative to rethink the concept of flexibility to ensure, beyond even the case of historical archetypes (Crespi, 1993) a flexibility that is not only guaranteed by traditional devices at the scale of interior design (i.e., sliding panels and doors, transformable furniture, modularity in the design of spaces and furnishings, etc.) but that is increasingly based on management organizations, modes of delivery of services and plant equipment.

A flexibility that mirrors, however, a change in attitude on the part of contemporary users, who are more *open*, as in their daily lives, to a coexistence of different and flexible activities and functions (in terms of place and time) that were previously considered and located in a very rigid manner in distinct places of the home. Indeed, in the spaces of a co-living, the distinction between rooms and between spaces is no longer based on the traditional differentiation in public areas and private areas of a conventional accommodation facility, where spaces are substantially and traditionally independent from each other. In a co-living both the functional and the symbolic relationship between spaces, activities, and human behavior contributes to the definition of the type of settlement and is at the basis of what constitutes our understanding regarding the sense of community.

It is therefore clear that in the design of service spaces, the user's experience is considered as a basic tenant for the achievement of design objectives. Post Covid design processes and methodologies related to co-living and co-housing developments, despite their differences, must focus on user experiences and be based on:

- concepts of social engagement;
- building community and sense of belonging;
- social networking;
- sociability;
- healthy lifestyle;
- sustainability;
- multifunctionality;
- innovation in terms of spaces-community;
- innovation in terms of technology;
- inclusion and re-evaluation of *ethics* in design;
- social positive impact on neighborhood.

Though the design of the user's experience, with reference to the system of service spaces, has existed in the work of the most *sensitive* designers (Pine, Gilmore, 2000), not all experiences can be considered the direct result of design; but a system of adequate and experiential spaces and services should be considered as a *stage*, open and flexible to individual relational behaviors by users and in which the system of

space-equipment-furniture-technologies and services plays a key role. This should be an important goal for designers.

The general awareness of the tenants of co-living has broadly expanded into the professional design communities and to the general population. However, further efforts need to be done regarding the promotion of the benefits of co-living and furthering research in the areas of behavior and knowledge of the tools that help successfully build concepts of community, all needs to continue. Designers recognize the benefits of co-living for an open, nomadic, and inclusive population, but promotion to a broader audience, such as those raising a family or the elderly, is needed to further educate and promote co-living as a viable housing option for people of all ages.

Research and innovative design solutions will certainly continue to advance co-living as a viable model of collective housing. The following list outlines specific areas and policy recommendations that should further the success of co-living:

- research regarding the health benefits for a broader, inclusive population;
- guidance and support regarding practical business strategies and innovative business models;
- increased academic exposure and experience for students to learn about and explore co-living themes through studio, seminar, and workshop experiences;
- further consideration to the distribution of public and private areas and to the management of strategies and tools used in building community;
- strategies and responsibilities that custom and contact furniture and equipment can have in co-living.

Practitioners and educators can provide didactic experiences aimed at exploring future trends that may forecast more co-living solutions that foster innovative use and user experiences. More needs to be done in the areas of research, scholarship, and design innovation regarding co-living, as the potential for a broader inclusion of users that may result in innovative solutions to help address and reduce loneliness and depression, along with the need to improve physical and mental well-being of its users. Co-living has sought innovative tools and solutions

for creating community that have developed from the successes and the failures of collective housing over the past century. Indeed, communal living is here to stay and should only attract more people as a viable option in the years ahead.

And, as we have tried to demonstrate in this essay, design can play a new role, looking to its fundamentals as well as to the new frontiers in its interdisciplinary potential and basis. Regarding our shared perspective about the value of *interdisciplinary design and a wide and plural perspective about values learned from considering ways in which people* live together and lessons learned from the study of co-living, we end with a quote from Bruce Mau: "When everything is connected to everything else, for better or for worse, everything matters" (Mau, 2020).

This quote, in particular, highlights how the area we are analyzing, with particular reference to collective living and the relationships between interior space and furnishings with new social types and spatial formats such as that of co-living, is certainly a way to highlight the new challenges of society and how people today, live together, introducing the potential to which design is called to respond and also to address the extrinsic nature of how people live together, not only to explore new solutions but also to seek new directions that address and respond to the needs and desires of co-living.

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2. Co-designing Public Spaces

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Abstract

Grassroots initiatives related to public spaces have increased in recent years, defining a process of urban regeneration. It is led by communities of users, starting from their needs and related mainly to a combination of spaces and services. The transformation of the city is sometimes temporary, related to occasional events or to figure out specific solutions (i.e. urban furnishing, tactical urbanism), to prototype and test scenarios and collect data and feedback to transform them into permanent design outputs.

Designers usually take on the role of activators and facilitators, guiding the group of stakeholders in the process of defining what the solutions might be.

This chapter analyzes and discusses co-design processes concerning the transformation of public spaces in the context of applied research activities led by the authors. In particular, the focus is on the change of certain key areas in the Nolo district of Milan and of spaces in primary and secondary schools in Milan, Turin and Padua. These are led by the Polimi Desis Lab, a research team based in the Design Department of the Politecnico di Milano.

2.1 Communities, resilience, co-design

The culture of resilience passes through a system of knowledge, opinions, customs and behaviours that characterize knowing how to react to the unexpected to create new situations that are more balanced. When applied to social innovation, the solutions that support it are to be found in people. This occurs not so much in individuals, but in how they group together in forms of cohesion in their communities: associations, informal groups, circles of friends, inhabitants of the same block of flats, people from the same neighbourhood. The UN stated that each individual should have the opportunity to participate in decision-making processes (United Nations, 1992). This way of being together, especially today, several months after such an extraordinary event as a pandemic, finds forms that result in collaborations to counter the unforeseen, respond to the existing, and imagine the future.

The recent pandemic has radically changed many social habits and affected the economic situation, generating new needs related to proximity living (availability of goods and services at a medium-short range) and a widespread crisis in the employment market.

Many of the responses being made to what people are now facing refer to the places where they live, work, and spend their leisure time and quality. Several examples show that today the neighbourhood dimension in cities is the most promising and active concerning resilience solutions in social innovation (Fassi, Manzini, 2021; Manzini, 2021).

When local communities are prepared to participate in collaborative actions, it is much easier to design, produce and stimulate solutions for a better life. There is, in fact, a level of proactivity that facilitates their creation: from small events more related to entertainment or cultural dissemination (festivals, thematic weeks) to actions that are more responsive to the particular needs of neighbourhoods that affect public spaces that are often overlooked (urban gardens, improvised play areas) up to real micro-transformations of spaces waiting for a structural change that takes on the character of temporariness to test their validity, effectiveness, proper use and the benefit for people (tactical urbanism, emergency solutions).

If involvement is based around a project, then it takes on the characteristics of infrastructure, i.e. leading to the creation of the physical, social, cultural and economic conditions that allow other projects and

activities to emerge and flourish. Some recent documents from the European Commission (Montalto *et al.*, 2020; OECD, 2018) highlight how this occurred even more during the pandemic, and as a response to it, by strengthening community-building and identifying successful innovative solutions.

Design is increasingly at the heart of this process of activating, supporting and facilitating bottom-up initiatives with its project culture, methods and tools. The involvement and participation of communities increase and assume a central role in rethinking the role of public space in contemporary cities and, above all, in the post-Covid period (Rossi, Perrone, Pillon, 2021). These are not just isolated episodes, but a network facilitated by the governance of the territory, which we find today in excellent cases such as Milan, Barcelona, Paris, just to name a few prominent European cities that now place people at the centre of the city's development.

In light of the changes brought about by the 2020 pandemic, we explore in this chapter what it means today to co-design public spaces through the analysis of two case studies by the Polimi DESIS Lab research group of which the two authors are members. Co-Design's engagement with the public realm is rooted in an activist tradition aspiring to increase democratic participation of diverse societal groups in design activities related to public space, services, systems or policy (Huybrechts *et al.*, 2017).

We refer here to "co-design" by sharing the approach declared in *Massive Codesign* book by Anna Meroni, Daniela Selloni and Martina Rossi (members of the Polimi DESIS Lab too) that is realting to

[…] a complex items: services, strategies and scenarios. These require the participation of multiple and various actors from both the public and private spheres, and expert and non-expert domains that fall within a sort of "third" space.
According to Muller (2008), this "third space" is a fertile environment in which participants can combine diverse knowledge in new insights and action plans. Codesign was originally associated with the initial stages of a creative process, the "front end" activities of exploration and the generation of ideas (Sanders and Stappers 2008), but it is now increasingly valued as an opportunity to create a "third space" or "infrastructure" (Bjögvinsson, Ehn and Hillgren, 2012) that facilitate discourse and collaboration among diverse players involved in a creative process ranging from the initial ideas to actual implementation.

The presented case studies consider how to facilitate a move from simple consultations to actual collaboration, in which "those who are consulted" become, in a way, the creators of "contents", ranging from direct feedback to more articulated contributions (Meroni *et al.*, 2018). The context in which the analysis takes place is the city, where the functional mix of public spaces and personal services guarantees a protected environment that is better suited to countering adverse agents, thanks to the different economies that exist[1]. We will see in the two case studies presented how the social distancing imposed by the pandemic has led to the re-inventing of new tools and methods of co-design.

2.2 Case Study 1: Off Campus Nolo

The Politecnico di Milano has been following, reporting, translating and designing solutions in the Nolo neighbourhood for over a decade, allowing its researchers and students to make their skills available to a local area. This presence found a more remarkable physicality in the district's covered municipal market when, in September 2020, it opened Off Campus Nolo[2], a neighbourhood living lab, a space for planning within the physical context of the area that helps develop ideas from the grassroots thanks to the polytechnic skills of design, architecture and engineering (Fig. 1).

The Politecnico di Milano has continued its social responsibility programme, which over the years has strengthened its presence in the city of Milan, with the idea of a more responsible university that is attentive to social challenges, open to and nearby territories and communities, through the activation and facilitation of projects with existing local realities (Cognetti, 2013; Fassi *et al.*, 2020; Pasqui, 1998). Nolo hosts an observatory for the regeneration and reactivation of neighbourhoods; laboratories and educational workshops, seminars and open lectures; exhibitions and public events; and an archive of projects developed over the years to become an agent of development for the reality of the market.

1. www.nytimes.com/2020/12/07/well/live/coronavirus-cities-safe.html.
2. www.instagram.com/offcampuspolimi/.

Fig. 1 – Off Campus Nolo, Municipal Market in Viale Monza, Milano (ph. Fabio Cocchi).

The space is also the studio of Radio Nolo[3], a web radio run by volunteers from the neighbourhood. This was the first partnership signed to activate and disseminate emerging projects through its broadcasts. A hybrid environment thus becomes a direct observatory on the area's problems and encourages dialogue with citizens and institutions through co-design activities.

In its first months of life, although the limitations of the ongoing pandemic slowed down its progress, Off Campus Nolo carried out an initial project: "Il Vocabolario di Quartiere – the Situated Dictionary"[4] (Fig. 2).

3. https://radionolo.it/.
4. This research project is coordinated by Virginia Tassinari, fellow researcher at the Politecnico di Milano. The research team includes Professor Davide Fassi, and Francesco Vergani and Ambra Borin, PhD candidates at the Department of Design.

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Fig. 2 – Vocabolario di Quartiere: words exhibition (ph. Politecnico di Milano).

In line with the principle that citizens should be understood as part of the solution and not part of the problem, and embracing the adaptation strategies that the city of Milan adopted in the second half of 2020, the Vocabulary has activated listening and co-designing guidelines for rethinking the city in the post-pandemic period (Tajani, 2021).

It is an experimental tool, developed by the Polimi DESIS Lab[5] research group with the support of Radio Nolo, which is available to citizens to initiate conversations which, by enriching themselves with different points of view and articulating the different sensibilities present in the area, can contribute to forming an authentic neighbourhood discourse. Words and actions can feed off each other and together give shape to a shared but, at the same time, multiple vision of everyday life. Conversations on terms such as public space, decay, sense of belonging, enjoyment, etc. have been opened up to different types of 'voices': for example, those voices which, for various reasons, are not always heard (the voices of foreigners, the elderly, children, the disabled, but also those of plants, animals, etc.); but also the voices of those

5. Polimi Desis Lab (www.desis.polimi.it/) was established in 2012 and belongs to the Desis association (www.desisnetwork.org/), an international network of design schools dealing with social innovation and sustainability.

already working in the neighbourhood, expert designers from Milan, but also international designers, or the voices of intellectuals, such as writers and artists. The aim is to give shape to a shared neighbourhood discourse, animating a culture of social transformation, in which words become concrete transformative actions for Nolo. The conversations are then narrated in the podcast "In Poche Parole", broadcast by Radio Nolo.

The process of listening and planning with the territory around the term "Public Space" was developed through various offline activities in the Off Campus spaces (pre-lockdown, September-October 2020) and online ideas (in lockdown, November 2020 – February 2021) with the use of specific software for sharing ideas. Moreover, public space plays a central role in the social dynamics of this neighbourhood and is often the subject of local discussions and experiments. The urban fabric is rich in design potential, which can be found primarily in the numerous underused or run-down public spaces.

Nolo has a solid potential both from the urban and social points of view and already has the distributional and functional characteristics in line with proximity living. The current municipal administration has made it the standard for the governance of the territory in the coming years. Proximity has been increasingly strengthened in recent years, thanks to the synergetic work of local associations, active citizens, creative people and public administration. The neighbourhood's social fabric presents itself as a community that is already very close-knit and predisposed to participate in collaborative actions. This can be defined as a "project community, i.e. groups of people who are born around an answer to a need in factual, design terms, and carry the idea forward to its realization, going even further, to the phase of use, testing, improvement" (Fassi, 2020; Manzini, 2021). Through the term "Public Space", an attempt has been made to understand in depth the dynamics of the neighbourhood and its local specificities, from the point of view of the daily experience of those who live it. The application of participatory methods made it possible to establish a dialogue with some of Nolo's inhabitants, creating relationships of trust and empathy. The research investigated the various meanings "Public Space" assumes within this territory, identifying the practices of use that characterize the spaces, the interdependencies that develop within them, and the layers of friction and conflict that

are inevitably established in such a complex reality. What emerged was intense transformative energy that often translates into processes capable of triggering inclusiveness and social cohesion. The tools used allowed for live interaction through a physical map of the neighbourhood positioned inside Off Campus; two facilitators and activators[6] of the conversations present during opening hours; and some objects to support the project (postcards on which to leave a text with an idea of transformation of the place or a graphic representation to accompany it). The development of the activities included a heterogeneous public, that includes customers of the market, inhabitants of the neighbourhood interested in the activity, and university students. The month-long offline activities were preparatory to the online activities. Some "design fiction" techniques were tested with a more targeted audience, who were already oriented towards elaborating ideas on specific places of interest that emerged from the first consultation.

The results led to:
– the creation of a map of design opportunities to respond to the need for transformation of some places "on hold";
– the elaboration of the podcast "In Poche parole" where the results of the activities were discussed;
– the implementation of an initial foundation of one of the ideas that emerged for the transformation of Piazzetta Transiti, a local never 'designed' and mistreated by several people (Figs. 3-4).

6. Two postgraduate students (Elisa Scrignar and Elisa Maramotti) were involved in an internship at the Polimi Desis research lab. One thesis about the transformatoin of the public space in the Nolo Neighbourhoods has been presented as an outcome of those activities. (Maria Maramotti, "Farsi Spazio", MSc Interior and Spatial Design, Politecnico di Milano, Tutor: prof. Davide Fassi. Presented in April 2020).

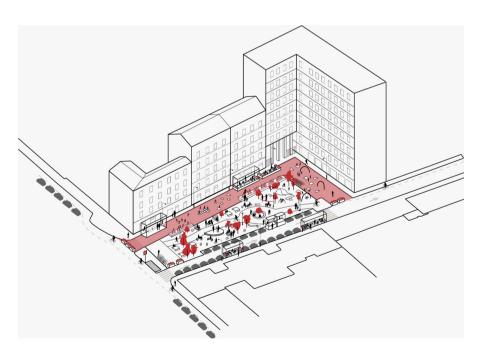*Fig. 3 – Piazzetta Transiti: suggestions by people (image by Maria Maramotti).*

Fig. 4 – Piazzetta Transiti: design proposal (image by Maria Maramotti).

The consultation activities between different local actors are currently underway to experiment with some temporary spatial solutions in the Piazzetta and the stipulation of a "collaboration pact"[7] with the Municipality of Milan for the care and maintenance of the place.

2.3 Case Study 2: La mia Scuola è differente! – My School is different!

Starting in 2019, the Polimi Desis Lab team has actively collaborated as a partner in the project "La mia Scuola è differente!", a three-year project (2019-22) selected and financed by Con i Bambini as part of the Fund for the Contrast of Educational Child Poverty, one of the winners of the "New Generations" national tender, and coordinated by Diapason Cooperativa Sociale di Milano. The project focuses on strengthening the school as an educating community and promotes, through innovative paths, the essential skills to prevent social exclusion.

Twenty-four partners are working on different activities to achieve this goal. The partners include five schools in Milan, Turin, and Padua. Among the leading partners in Milan is the Polimi DESIS Lab research group in the role of coordinator of the 2.0 School activity. This action aims to regenerate some common spaces inside the buildings of the partner schools of the project through participatory planning paths with the communities that live and learn in the schools every day.

This project was an opportunity to reflect on various topics: on the importance of public space as a generator of sociability inside and outside school buildings; on the relevance of the collaboration and participation of communities in the various co-designing phases; on the usefulness of prototyping and the creation of a simulation of spaces as a test of the design hypotheses that emerged from the co-design paths; on the role of spaces as places of socialization and the value of their shared design in preventing social exclusion,; and on building a solid synergy between school, territory, and city.

The study of school structures and the redesign of common spaces also leads to revising teaching and training activities (Dovey, Fisher,

7. www.comune.milano.it/web/patti-di-collaborazione.

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2014). The connection between spaces and learning activities has been confirmed for years, starting with the idea that space is the third educator (Malaguzzi, 2010) for children attending an educational facility. A greater fluidity of the spaces allows more significant movement of students, which interrupts the normal rhythm of work and study and allows and promotes a greater propensity for learning (Brittin *et al.*, 2015).

The space is intended as a container that favours social interaction, exploration and learning, and has an educational "content", which offers educational messages within it and is full of stimuli in the direction of constructive knowledge.

The space in the school is a constitutive element for the formation of thought and has a solid and effective language. Spatial language is multisensory, involving remote receptors (eyes, ears, nose) and immediate receptors (such as skin, membranes, and muscles) (Rinaldi, 1998).

Furthermore, we can speak of relational space because the environment is a sort of cradle of relationships, interactions, possibilities, and limits. But the environment is not a container that welcomes without interference; it is more of a "mediator" because it is an object/subject that is strongly intertwined in the relational texture that characterizes places and, specifically, educational classes.

"La mia scuola è differente!" project includes a series of activities to be developed over three years, which include, among others, experiences of "school open to the territory" with working groups, and activities in the extracurricular environment involving pupils, teachers and parents, as in the case of the School 2.0 activity coordinated by the researchers of the Politecnico.

During the first year of the project, the School 2.0 activity launched five co-designing processes for the redevelopment of the common spaces of the partner schools; these were live co-design sessions, carried out with teachers, managers, parents, grandparents, students, and school staff.

The co-design paths followed a standard process (Figs. 5-6):
– a first observation session of the uses of the spaces, the habits and customs of the different populations that inhabit them, and the formalization of a list of possible areas in which to intervene;
– the second activity of a study of case studies and best practices from which to draw inspiration;

- a third session focused on recognizing needs and desires and then arriving at the definition of the space in which to refine the co-design activity;
- a fourth activity of selecting the functions to host in the chosen space;
- a reflection on the positioning of functions in the space and the collective construction of a sort of masterplan of the area and therefore of a shared plan;
- a sixth joint construction activity of a mood board;
- the application of the mood board in the space, the choice of some furnishings and possible finishes, and following the definition of a list of purchases to be made;
- the organization of activities to be carried out together with the whole school community during a prototyping event.

Fig. 5 – La mia Scuola è differente! Co-design session at the primary and middle school "Istituto Comprensivo Sandro Pertini", Milan (ph. Ambra Borin).

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Fig. 6 – La mia Scuola è differente! Co-design session at the nursery "Istituto Comprensivo Statale Niccolò Tommaseo" (ph. Ambra Borin).

The spaces in which to intervene, selected together with the schools, are of different types: a reading room for an elementary school; corridors to be transformed through graphic elements and furnishings that improve the reception in the classrooms; an area dedicated to the lunch break; a psychomotricity classroom; a courtyard for a kindergarten; a lecture hall to be transformed into a showcase space for the institute; a sort of multifunctional space that can host musical and theatrical events, and which in the future can be a hub for extra-curricular activities and neighbourhood activities (Fig. 7).

Fig. 7 – La mia Scuola è differente! Prototyping activity with Pertini School (MI) (ph. Ambra Borin).

At the end of the first year of the co-design activities with schools, when 4 out of 5 paths were underway, and some were almost completed, the process suffered a decisive setback caused by the spread of the Covid-19 virus from the first lockdown.

Faced with great uncertainty and the numerous questions that arose about the present and the future, it was certainly challenging to talk with schools, which were closed to ordinary activities, about participatory processes, shared spaces, living spaces in groups, and even the

possibility of opening schools to the neighbourhood and the organization of prototyping events.

After a few months' standstill, the co-design sessions were remotely reorganized, thanks to shared digital platforms. On the one hand, this has undoubtedly made it easier to reach everyone, even for short discussion meetings, and has sometimes made the process easier. But, on the other hand, it made it more difficult to involve students more regularly, and more interestingly, it meant the various actors involved had to deal with new tools that require more specific knowledge.

The compulsory social distancing made it impossible to carry out collective prototyping activities, space tests, and presentations to the entire school community. This was undoubtedly the most complex aspect in managing the new structure of the process during the pandemic.

Regarding the co-design processes already underway, in which the spatial project had already been defined, it was necessary to review some characteristics in the light of the rules related to social distancing. The most urgent request relates to the use of space in small groups, guaranteeing respect for physical distances between individuals. However, the city disovered an exciting theme of the relationship between schools and the surrounding area between the school and the neighbourhood. The strategic theme is also searching for larger spaces to respond to the most urgent requests just underlined. Schools and their surrounding public places could become the fulcrum of the first interventions of micro-mobility, pedestrianization, which are key interventions to redesign the proximity relationships, the new neighbourhood dimension. (Mattioli, Renzoni, Savoldi, 2020)

2.4 Emerging Issues

In the preceding paragraphs, we have seen how designing public space through a participatory process brings together a complexity of actors, actions and contexts, which is not always easy to govern. In this paragraph, we will try to outline some final considerations, derived partly from direct experience and validated by the literature, which will bring out the strengths and weaknesses of the process, highlighting the opportunities and potential threats.

2.4.1 Comparison

The consultation of the different voices goes through processes that are sometimes tortuous, dichotomous and full of contrasts. Involving many actors and people, communicating the scope of intervention and the path of participation, bringing forward examples and visions, creating conversations, listening to and translating voices – all of these can help mitigate the threat of conflicts between different factions that inevitably arise.

It is about to deal with that "third space" mentioned in the introduction, to manage it and to get advantage of the richness it takes, made of different voices, competences, skills, background.

Nevertheless, the creation of the 'consensus' has to accept its limits. Participation deals with the identities and subjectivities of participants, and outcomes depend on it, limiting the design actions in the public realm, not to mention the broadest range of possible people and groups that may or may not be pre-constituted concerning particular issues (Keshavarz, Maze, 2013). Co-designing usually involves people predisposed to participation and confrontation (associations, informal groups, activists), but also has to deal with that part of the local population that is not used to such processes, and is distrustful of those who work for the common good. An 'urban' context entails the co-existence of actors with different (agonistic) interests. It is characterized by negotiations among such other interests (Dellenbaugh *et al.*, 2015; Eriksen *et al.*, 2016) that is why it is necessary to explore an alternative based on 'dissensus', as theorized within political philosophy where the design role is that of a reflexive and situated translator (Mouffe, 2000; Rancière, 2015)

2.4.2 Sense of belonging

There is an undoubted advantage in involving local communities in the transformation processes of the spaces that animate their everyday life. Involvement leads to a greater sense of belonging to the result because it is considered as one's own and therefore is to be cared for, preserved, maintained and somehow defended. In this way, the perception of a community of place is also increased, where the

network of neighbours and the assistance between inhabitants have a fertile ground (Carr *et al.*, 1992). Furthermore, the perceived quality of neighbourhood public spaces and services is significantly and positively associated with a sense of community (Francis *et al.*, 2012) and even the spatial layout and the functional mix (including residential and transportation realms) could reinforce this connection (Talen, 2000). Where a principle of dissent, understood as the inclusion of diverse voices in the participation process, has not been adopted, the sense of belonging is lost. This can lead to an ex-post exclusion of the use of the place by uninvolved actors, resulting in less proactivity (actor vs spectator).

2.4.3 Waiting

Time is an essential variable in the construction of the process and the sedimentation of the result. The structure of a community of reference, if not yet existing, and/or its involvement in the co-design process entails longer times of immersion in the context by the designer than a classic design process (Meroni *et al.*, 2018; Sanders, Stappers, 2008). This is because of the creation of empathy between the activator (designer) and the actives (stakeholders). The process of trust between the parties and the credibility of the path is built with time and continuous presence in the context. Moreover, when the transformation of public space goes through the approach of temporariness as a strategy of adaptable solutions for the long term (Fassi, Galluzzo, 2018), this generates in those who were not part of the process an instant reaction of rejection of the change that is often mitigated over time through the use phase. This was found in several examples of tactical urbanism in the Nolo neighbourhood. The use of the spaces and services co-designed and made available to the population initially met with a high level of mistrust, especially on the part of the shopkeepers located along the streets concerned, who complained of reduced income due to the lack of parking spaces in front of their businesses. These fears were dispelled as the weeks went by, to the benefit of adaptation to the intervention and active participation in the life of the sites (e.g. equipping the spaces with tables and chairs, renting board games, etc.).

2.4.4 During and post-pandemic emergency

During the lockdowns and the semi-opening periods, participatory processes have undoubtedly suffered slowdowns and second thoughts: the need to meet in small groups or carry out co-creation activities at a distance have favoured an acceleration in the redesign of the digital co-design tools and activities.

This acceleration towards the digitization of tools and methods inevitably creates the need to respond to and reflect on new trends. While on the one hand, it can bring a more comprehensive public closer to the participatory processes themselves, favouring "that right to the city as the right to participate in the construction of its future" (Rossi *et al.*, 2021); on the other hand, however, the adoption of digital tools can also remove some possible actors of co-design.

During the Covid-19 pandemic, one of the first consequences was the lack of a strong diversification and variety of the components of the communities involved during the co-design process, precisely due to the use of digital tools, shared boards, etc., which, as suggested by the authors could on the one hand greatly facilitate the activities and on the other cause quite a significant digital divide.

Also, the opening and closing ceremonies of the activities (Meroni *et al.*, 2018) have radically changed due to remote co-design activities and in the case of co-designing in small groups. The importance of the classification of "responses" and shared experiences so they can be collected during the activities and easily used later as results in the different stages of the process is certainly answered by the greater diffusion of digital tools.

Even the experience of the co-designing sessions has undergone variations in terms of timing; level of concentration and attention required; fatigue from overexposure to screens; ease and propensity for networking; and socializing with the rest of the group of participants and facilitators.

Finally, with regard to the boundary object in this fast and forced acceleration towards a new level of digitalization and virtualization of co-design activities, the aspect that has undoubtedly suffered the most significant impact is the possibility of manipulating, and being able to assemble and dis-assemble possible prototypes, leaving less room for improvisation, and thus making the participants a little less proactive in the design process.

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Part II

Experience design for engaging spaces

3. Reusing the built space: atmosphere and human experience

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Abstract

The quality of the built environment deeply affects people well-being, social interaction and cohesion, creativity and place attachment. Reversely, people's quality of life strongly affects their ecological relationship with places and the environment, influences the way they share emotions, experiences, needs and objectives. Given the holistic nature of perception, the sense of things is captured on several levels through a synchronic transformation defined as synesthesia (Crisci, 2012). Built spaces do not create simple objects of visual seduction, they get into relation through the senses, convey meanings and memories. The sense of alienation we often experience in contemporary spaces, sometimes perceived as non-places, may be related to the weakness of their atmospheric quality, to a lower impact on our memory and peripheral vision compared with historical and natural settings, which instead stimulate a stronger emotional involvement. In collectively shaping the places where we live, it is essential to approach the built space from a holistic, humanistic, culture-centred point of view, responding not only to functional, technical and economic needs, but also to social and psychological needs. Reuse design of urban abandoned spaces can allow people to benefit from memory, engaging atmospheres and synaesthetic experiences to prevent stress and restore attention, promoting urban regeneration and improving individual and community wellbeing.

3.1 Introduction

Reflections on the relationship between people and spaces have been carried out by disciplines such as architecture, interior design, anthropology, urban planning, environmental psychology. Understanding such a complex reality requires to overcome simplification, paying attention to the multiformity of human beings and their continuous evolution. A balance between space and psycho-physical wellbeing should be redefined, since the latter is deeply affected by the quality of the built environment, by social interaction and cohesion, creativity and place attachment. Reversely, people's quality of life strongly affects their relationship with places.

Though the recent period has brought people apart due to pandemic risks, physical places continue to play a fundamental role being the scenario of the most significant human relationships, and the emotional bonds between people and their physical surroundings are a powerful aspect of human life. These connections inform our sense of identity, create meaning in our lives, facilitate community and influence action. Despite the fact that contemporary life leads us to inhabit different cities and buildings throughout our existences, we still need to recognise ourselves in places and in history. Place attachment has to do with many diverse issues as rootedness and belonging, placemaking and displacement, mobility and migration, intergroup conflict, civic engagement, urban regeneration, natural resource management and global climate change (Anzani, Caramel, 2020).

In his *La Poétique de l'Espace*, Bachelard (1958) highlights how experiencing places produces values and attitudes toward the world and creates a cultural, biologically based, close connection which plays a fundamental role in our development. Such geographically "embedded" connections, which have been mostly destroyed by modernity and globalization, needs to be more and more reinvented, also thanks to technology which allows to overcome physical limitations. Tuan's distinction between space and place and his genealogy of the concept of place (Tuan, 1974) have become very important for many geographers, philosophers and sociologists, as well as for cultural approaches to place in general. His ideas have been studied in connection with wellbeing since individual preferences for specific places and restorative environments proved significantly associated with the quality of life (Menatti,

Casado da Rocha, 2016). The relationship with places has perceptual, mental and physical ground, a present and a memory dimension, which once again consists of a complex experience that involves physical, emotional and mental levels (Marchino, Mizrahil, 2011). A discrepancy, an altered balance between body and space, can provoke a "vertigo". According to La Cecla, "feeling lost" is perceiving that there is a gap, a continuity solution between us and our surroundings. We find ourselves caught between an expectation of familiarity, of affective adherence or understanding with a place, and a contrary command coming from the place itself. We can feel sick in a place that we cannot perceive of our own because our body expects an affinity with the surrounding which is denied; therefore, the world around us becomes ambiguous and unbearable, dangerous and insignificant. Just as the body, the individual place of memory, can be the site of blockages and pain, so the city, the collective place of memory, can be the site of disorientation. On the other hand, our bodies (our cities) are also a source of happiness and pleasure (Anzani, Caramel, 2015). Through our whole body we perceive the landscape in which we live embedded and our ecological relation to the environment affects our wellbeing and the exercise of our mind (Mace, 2005). In fact, built spaces exist thanks to memory, get into relation, mediate through the senses, convey meanings and atmospheres. The paper will present some reflections on the importance of space engagement, the impact of places of different qualities on personal wellbeing, the meaning and increasing value of atmosphere, its psychological implications and its connection with memory, their enhancement in relation with the promotion of urban spaces reuse.

3.2 Engaging spaces

In the field of interaction design, interesting results have been collected on engagement with particular technologies which could have important implication also to approach interior and spatial design. Since technologies do not exist by themselves but are parts of larger assemblies including physical properties and forms of cultural practice, consequently people's engagement cannot be understood without considering this complexity. For understanding people's engagement with technology, a focus on the individual object is too narrow; an

account is needed, that is capable of capturing engagement as a product of relations between physical, cultural, social, and content-related elements. Similarly, also to provide an account of space engagement, a focus should be kept on how engagement evolves, not only as a relationship between people and single spaces, but in complex situations involving other people, cultural practices, objects and surroundings. In the research literature, different elements of engaging experiences have been identified which could apply both to technology and spaces: cultural practices, physical conditions, the content of the installations, and social practices.

Our existence in the world as physical beings is central to the ways in which we make sense of the world, and this is inescapable, in the exam of how people's engagement with technology or spaces unfolds in practice. Our physical presence in a given setting means that we are affected by our surroundings even before we consciously enter into sense-making processes, which is the basis of *affective engagement* (Fritsch, 2009).

Furthermore, several strands of research have addressed the notion of *sense-making through physical action* (Fig. 1): when we make sense of things, reflect upon, analyse, and make plans for our actions in the world, these processes are often supported by physical actions or manipulations, and this highlights the important role of *physical materials* in our interaction with our surrounding environment (Dalsgaard *et al.*, 2011).

When we interact with digital systems, with other types of media, or with a space, there are various ways of engaging with the content of the medium or system. According to Dewey's pragmatist aesthetics (Dewey, 1934), engagement occurs when a person invests part of herself in the encounter with the content therefore, although the experience is not only inherent in the content itself or the quality of the space, however the content may be structured in ways that make certain encounters and experiences more likely.

Environmental psychology, that studies how both natural and man-made environment influences our psychic processes and, on the other hand, how our mind perceives and experiences it, has developed precise and well-established models and theories on environmental pleasantness and preference (Inghilleri, 2021).

Fig. 1 – Sense-making through physical action: unused historical building in Milan.

There are characteristics of a place, of a part of the city, of a building, of a house, of a room, which in themselves facilitate pleasant experiences and generate good emotions. These are not just structural characteristics such as light, colour, size, or aesthetics, but rather relational attributes, i.e., they allow a particular psychological relationship to develop between us and the place (Fig. 2).

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Fig. 2 – Light, colour and other physical characteristics can facilitate pleasant experiences and generate good emotions: unused historical building in Milan.

In particular, an environment conveys positive emotions when it is quickly understood and, at the same time, it can be actively explored allowing to learn more about it. More specifically, it must be coherent i.e., it must resemble what one already knows; readable i.e., it must contain information that facilitates comprehension; complex i.e., it must be rich in both perceptive and symbolic stimuli; mysterious i.e., it must induce the feeling of being able to know, by visiting it, something new either about the place, or about oneself (Inghilleri, 2021).

The psychologist Colin Ellard monitored the biological responses of people walking two nearby streets. In walking past a monotonous

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glass façade, people walked faster and reacted with a sensation of boredom and an increasing stress level. In the other street, with an abundance of small shops and open doors and street wares, people slowed their pace but felt lively, social, and eager to participate in the activities. According to the anthropologist E.T. Hall, who in 1966 raised the issue of "tactile spaces", the failing of modern architecture was its lack of scale and tactile stimulation (Fig. 3): "Our urban spaces provide little excitement or visual variation and virtually no opportunity to build a kinesthetic repertoire of spatial experiences. It would appear that many people are kinesthetically deprived and even cramped" (Mallgrave, 2019).

In 1979 the psychologist J. Gibson introduced the idea of "affordance" i.e., the notion that we perceive the world not as entities (objects) to which we assign a name, but more primordially as the uses offered to us, such as warmth, shelter, and carrying out a task. Translating this into architectural terms, we perceive the built environment in terms of the possibilities and limits of our sensory and emotional engagement with it (Mallgrave, 2019) (Fig. 4).

Another highly developed field in environmental psychology is studying the effects of nature on our minds and bodies. A large amount of research has amply demonstrated that exposure to natural landscapes produces positive effects at many levels, from cognitive and emotional development to individual health and resilience to trauma.

There are several explanations as to how this positive effect is generated. The main theoretical frameworks, namely attention regeneration theory and stress recovery theory, tend to explain the environment-wellness relationship as an automatic regulatory system through which people unconsciously regain normal levels of cognitive functioning after a period of mental fatigue (Inghilleri, 2021).

a)

b)

Fig. 3 – The failing of modern architecture is its lack of scale and tactile stimu-lation, which traditional architecture possesses: a) Bellino (CN), Italy: Borgata Chiazale; b) Basel (CH), 2021.

Fig. 4 – Affordance is the notion that we primordially perceive the world as the uses offered to us. The Community oven in Borgata Pleyne (presumably 17th-18th century, modified), Bellino (CN), Italy (Comune di Bellino, 2017).

The theory of regeneration of attention considers that, in everyday life, we have to continuously employ a form of attention, defined as voluntary, towards activities that would not spontaneously attract us because they are uninspiring and uninteresting. Thanks to this cognitive mechanism we can cope with the great mass of information to which we are exposed in different fields. However, this attentional resource is not unlimited and tends to be exhausted. The fact that our cognitive and emotional functions are overloaded has a negative impact on some of the most important mental activities, such as problem solving, concentration and the development of behavioural strategies, which are usually associated with an emotional state of irritability, fatigue and depression. To activate resources that prevent these negative effects, the so-called fascination comes into play i.e., involuntary or effortless attention which does not require cognitive effort and are directly guided by the pleasantness of environmental stimuli or by leisure or autotelic activities (Fig. 5).

The theory of recovery from stress stems from a famous study that evaluated post-surgery complications in patients with the same illness, but with a different spatial location in the hospital. It showed that

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patients in rooms with a view of the inner garden had a shorter recovery time, less need for medication and less emotional stress than other patients in rooms without a view, who were forced to look at the wall in front of them.

Fig. 5 – Fascination i.e., effortless attention, is directly guided by the pleasantness of activities or environmental stimuli: Biennale Sessions, Venice, June 2021.

The effect was explained by the hypothesis that human beings biologically and mentally develop a rapid and automatic response when immersed in the environment corresponding to the species' origin, when *Sapiens'* central nervous system and biological functions were formed. Recent studies carried out on the health effects of nature, found that spending time in the natural environment or exposed to greenery can provide protection against a surprising range of diseases, including depression, diabetes, obesity, cardiovascular disease and cancer, and this is due to an increased functioning of the immune system, which reacts better against pathogens (Fig. 6). In his book titled *Biophilia* published

in 1984, through numerous empirical studies, Wilson argued that in the human species there is an innate tendency – an instinct derived from evolution – to relate to the natural world and all life forms, and to love and care for nature.

a)

b)

Fig. 6 – Spending time in the natural environment or exposed to greenery provides protection against a surprising range of diseases; a) Bellino (CN), Italy: Borgata Pleyne; b) Rhein, 2017.

In fact, biophilia is the innate tendency to focus attention on life forms and all that reminds us of them, and in some cases to become emotionally attached to them. This concept is actually associated with empathy and with the ability to concentrate effortlessly and be fascinated by natural elements i.e., be emotionally attached to different life forms and participate in their condition.

3.2.1 Tridimensional spatiality

Perception, memory and representation are strictly connected. Conceived according to two-dimensional perceptual schemes which derived from an Illuminist spatial composition that represented objects on a flat surface, our cities have become the result of hierarchies essentially based on contours and patterns, aimed at satisfying our sense of symmetry and mental order, without allowing a real direct experience of the third dimension. Therefore, the recovery of our urban areas should start not exclusively from design as such, but from a physical and psychological space re-appropriation, extending our environmental engagement to all the sensitive data of our sensorial, and not only visually, relationship with the space (Guglielmi, 2020). In fact, representation is a direct consequence of perception, but perception and memory are inseparable. What characterizes space is its simultaneity and the consistency of all its parts. In the perception of a large view field, space parts are progressively learned as it is travelled by our receptors and memory provides the newly identified elements with a spatial meaning in relation to those already perceived (Fig. 7).

3.3 Atmosphere and experience of places

One of the concepts often used in different fields and disciplines to describe environments that are particularly engaging and exciting is atmosphere. Because of its elusive, ephemeral and aerial nature, usually atmosphere is somehow "undefinable"; nevertheless, though it has blurred boundaries and intangible limits, it is one of the guiding concepts for designing urban and interior places.

Fig. 7 – Space is progressively learned as it is travelled by our receptors and memory provides the newly identified elements with a spatial meaning in relation to those already perceived: Arsenale, Venice, June 2021.

In fact, the importance of designing complex and inclusive experiences, focused on the atmospheres and on suitable services, is emerging in many fields. Like the understanding of landscape cannot be based on a single perceptive faculty but must be supported by an "immersion" act from which an overall emotion derives, so an "atmospheric" experience cannot be understood through a single object present in the territory; it occurs through an emotional complex suggested by a set of elements, and it is inevitably multisensory. In fact, our sense of things is captured on several levels through a synchronic transformation that can be metaphorically defined as synesthesia (Fig. 8).

Fig. 8 – An "atmospheric" experience cannot be understood through a single object but through an emotional complex suggested by a set of elements: La Paz (BOL).

Actually, the term *synaesthesia*, from *syn* (union) and *aisthesis* (perception or sensory-based experience), according to Bruno (2022) is frequently used in common language to indicate anything that relates to the senses. In the cognitive neurosciences, synaesthesia refers to a specific and rare form of multisensory interaction. What is commonly intended is instead multimodality and the contemporary notion of synaesthetic design (Bruno, 2022).

In his essay on *Atmosphere design of urban places*, Sinico treats the perception of atmosphere in scientific terms, to be used operationally by designers who want to enhance the expressiveness of design artifacts in function of the urban context (Sinico, 2022). Though a rich speculative literature on atmosphere has been produced, however a satisfactory operational definition has never been formulated. The difficulty in defining atmosphere lies, on the one hand, in its non-abstract nature, like that of virtue or justice. On the other hand, though being an obvious immediate experience that everyone is familiar with, it lacks a material empirical base: atmosphere is not quantifiable with a measuring device.

However, one of the important effects of an environment atmosphere, is that it activates and reinforces certain ways of being, some aspects of the persons' self such that, in the external environmental field, the ego can find its own internal values. This practice, which has nothing to do with empathy, represents a process in which a way of being of the self, that can be desired or rejected by the person her/himself, is activated and strengthened. This is why the atmosphere of an inhabited place attracts or repels us because, in those external structures, we find specific characteristics of our own that we approve or disapprove, that we discover for the first time or from which we are pressed into a rejected identity.

In his lecture titled *The Culture of Design*, Mallgrave mentions a definition of architecture given by Gernot Böhme not as a visual art but as one accessible only through its emotional tenor or mood. Architecture is "the space of mindful physical presence: and the designer (through the use of form, light, sound, physical constellations, social and cultural entreaties) modulates space "by creating confines or expanse, directions, delimiting or transgressive atmospheres".

Peter Zumthor equates atmosphere in design with "how a building manages to move me", and designers create a mood and sense of expectation through materiality, the sound and temperature of a place, light and level of intimacy. Atmosphere also encompasses "people, the air, noises, sound, colours, material presences, textures, forms too – form I can appreciate. Forms I can try to decipher. Forms I find beautiful" (Mallgrave, 2019).

3.3.1 Atmosphere: senses, memory, imagination

When we speak of atmospheres in a psychological sense, we are certainly speaking of perception, in a key that we believe can be approached in terms of comprehension, rather than of pure rational description or explanation. The perceptual phenomenon that characterises an atmosphere display is, as always, made up of senses, motility and memory, which together trigger the imagination; the latter in turn guides attention to the point of no return where it is kind of abducted within the limits of a state of mind and a subjective world. A "soft" captivity, which is often temporary and easily reversible but can also

turn into rigid imprisonment. In this step up, a particular role is played by the relational context, which is able to favour, trigger and feed self-perpetuation mechanisms. Finally, the complexity of this phenomenon, which is already considerable, takes a further step up if we consider that these states of mind can be a fundamental part of the sense of identity of a person, a family, a community; its direction can be either oriented towards development or, vice versa, towards existential impasse.

These dynamics can be illustrated by means of two examples. One is taken from the context of psychological care work, the other from the world of literature.

"Houses hide in the back of the streets/like mothers who do not tell their melancholy". In the first example, these verses were written some time ago by a young adult recalling a dream he had a few years earlier, at the beginning of his university studies, when he was in the midst of a major identity crisis. In the dream, the young man was walking along an undefined street in his city. A very ordinary street, with little traffic and not very crowded, surrounded by the characteristic houses built in the years of the economic boom. Walking in his dream, the young man felt divided: on the one hand, a very ordinary familiar landscape, neither happy nor sad, neither too beautiful nor too ugly, made him feel distinctly reassured. On the other hand, he felt uneasy and alarmed, as if this whole routine had come to an end, and at any moment something was going to happen. What? As he looked up at the houses at the end of the street – not knowing how or why – they evoked the image and feeling of melancholy mothers, leading an orderly and never-changing life, nostalgic for the childhood of their grown-up children to whom, whatever happens, they would always tell that everything is fine.

This is an important dream, being the first one told in the first session of what would become a fruitful psychotherapy. It marks a bifurcation point in the young man's life. Yet, we are not in the presence of dramatic scenarios, strong colours, impressive figures that are metaphors for equally intense emotions. In this case, what Ernest Hartmann has called the "central image of the dream" (Hartmann, 2008), corresponding to the affection or the emotion that characteristically gives rise to the dream itself, appears to be diffuse, or even better as emerging from an ensemble. "Ensemble" is an appropriate term for approaching the intrinsic nature of a human relationship in a way that is neither strictly phenomenological nor reductively descriptive, but

with the intention of understanding it. In this regard, Schinco suggests that "being" is by nature "being with someone" (Schinco, 2011). In this circumstance, the dreamer's being, namely his affections, memories, tensions towards the future, emerges thanks to "someone" who is present on several levels. First of all, the "someone" who permeates the dreamer's linguistic world, thus enabling him to remember and recount the dream; then, the "someone" of his self-consciousness; then again, the therapist to whom he recounts it and who formulates comments; finally, the real or imaginary recipients of the verses which, through a simple action of creative re-use (Schinco, 2020) arise years later from the dream narrative. All these presences and subjectivities allows to deal with the being that emerges from the dream and manifests itself through the dreamer's relationship with small details, each one insignificant if considered in isolation: the pavements greyness, the sensory characteristics of the constructive materials of the houses, their rather anonymous style, their sequence. Sense and memory become imagination in a poetics of lack. Paradoxically, the sense of detachment and lack brings together, on an emotional level, the dreamer and those from whom he is detaching: his original family, summed up in the feeling of his mother, the first and unforgettable place we dwell "with someone", namely with the mother herself. Consequently, the first place from which each of us is irreversibly detached at birth. And yet, life develops in this way, in the inexorable alternation of attachment and detachment, corresponding to an alternation of overwhelming emotions: euphoria and depression, relief and fear, transport and anger. To some extent, this alternation of strong emotions and affections need to be softened, attenuated, in order to govern our daily life and exercise responsibility. The development of the nostalgia feeling, and consequently of mentalities and cultures inspired by it, was born as a sort of medicine, an existential soothing agent. To the extent that it becomes poetry and is shared, it proves an effective and irreplaceable remedy. Indeed, it is rare for a work of art not to contain, even if cleverly concealed, at least a slight touch of melancholy.

The second example deals with *Atmosphere, nostalgia and dead ends*. Like any symptomatically effective drug, nostalgia can be addictive and lead the nostalgic down dangerous blind alleys. An emblematic example is the narrative of the great Piedmonts' writer Cesare Pavese. The poetics of dwelling is present in the writer's entire oeuvre,

from his early years to the premature end of his life. Apparently, Pavese is torn between two irreconcilable affiliations, that of the city in which he is formed on a poetic and intellectual level – Turin – and that of the hill – the Langhe – from which he comes, and which nourishes the mythological dimension of his inner life. In reality, Pavese feels painfully separated from both: his introspection is a continuous search for an atmosphere that reconnects him to one or the other dimension of belonging and dwelling; a desperate undertaking, because deep down he feels that both are now irretrievable. The one, that of childhood linked to the hills, with his fantasies of discovering new worlds beyond the horizon marked by the hills themselves, is gone forever. The same goes for the other, that of youth linked to the city and his continuous escape from the limitations of the present moment and place. The only territory of which the writer feels to be a full "inhabitant" is that of his imagination, through which he manages to revive the memories of both lost worlds. Nevertheless, as it is the case for everyone, emotional and social relationships inevitably solicit, perturb and even disturb the imaginary in its effort of fictitious revitalisation. Therefore, gripped by a sort of anxiety for his own psychological survival, Pavese takes and tenaciously pursues the path of an acute but emotionally isolated observer, committed to opposing his natural empathy. However, the latter is never fully tamed and new and unresolvable tensions are created. One is emotional, in that the artist is a man like anyone, thirsting to give and receive love; the other is ethical, in that the price of isolation is also the renunciation to relational, political and social responsibilities.

In one of his maturity masterpieces, *La casa in collina* – The House on the Hill – (Pavese, 1948), the theme of dwelling and atmosphere are in the foreground even in the title, since the hill, even before being a distinct physical place, is openly characterised as an atmosphere: that of childhood. To escape the night bombings, the protagonist of the short novel has taken refuge in a house on the hillside of Turin: every day he goes to work in the city and every evening he returns to the hill. The house on the hill metaphorically configures a psychological refuge entirely constructed in his imagination out of memory: the details of the landscape recall that of his childhood, the distant and wild Langa hills, even if the real place is another. The proximity and the daytime frequentation of the present city, devastated by the war, allow him to

take refuge every evening in the house on the hill, in the imaginary night-time frequentation of a city that no longer exists, that of his own youth. In the conclusion of the story, the protagonist, a figure of Pavese himself, makes ruthless confessions, such as the following:

… I realise that I have experienced one long isolation, a futile holiday, like a boy who playing hide-and-seek enters a bush and is comfortable there, looks at the sky from under the leaves, and forgets to go out ever again.

Outside of literary fiction, for the now acclaimed artist, we know that an ethical anchorage to reality remains, thanks to his awareness of the contribution given to the community through the exercise of his art. But not many months later, at the end of his last masterpiece *La luna e i falò* – The moon and the campfires –, Pavese confesses to feel "like a fired shotgun". In these words, a heavy and painful feeling of emptiness, lack of meaning and resources can be recognised, that very easily manifests in creative people immediately after exceptional artistic operations, where they reach their own limits. It is a state of mind that is easily confused with depression, which is not, although the mood deflection can trigger a clinically relevant depressive descent. Rather, it is an existential condition, characterised by reversibility and oscillation of images, emotions and affections. The end of a person's life is always a mystery, and as such it should be respected and approached on tiptoe. We can only dare to imagine that Pavese, in feeling emptied on a creative level, may have sensed that after the territories of his childhood and youth, also the territory of his imagination was exhausted and sterile, and with it any residual possibility of giving something to someone; from this, may have come the deliberate choice to suicide.

3.3.2 Atmosphere as a key to the affective underground of a place

Every time we relate to an inhabited place, our perception is activated and, with the contribution of imagination and memory, guided by attention which is in turn oriented by participation in relational processes, we construct a mental image of that place. This image is closely related to affects and emotions, of which it can be a discreet but powerful metaphor. If the relationship between the details of this image

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and an emotional experience is immediate and penetrating, we are in the presence of an atmosphere (Fig. 9).

Atmosphere is characterised precisely by the evocative power of the details. As in the dream, it is the small that reveals the large. Like the dream and the symptom in psychic discomfort, the atmosphere is able

Fig. 9 – If the relationship between the details of our mental image and an emotional experience is immediate and penetrating, we are in the presence of an atmosphere: unused historical building in Milan.

to reveal through the operation of concealment; it does not know the limitations of the non-contradiction principle or even the explicit negation: to negate it affirms and it is able to conceal while it reveals. Atmosphere is a somewhat insidious reality; nevertheless, taking it into serious consideration and allowing oneself to be contaminated by it, is vital because it is a qualified witness of the "affective underground" of a place.

Anyone who intends to operate on a place without caring about its atmospheres is behaving in the same way as someone who believes he can achieve social justice or democracy through the exclusive exercise of authority and military force. Whether the intentions are good or not, however well thought-out the projects and work plans may be, the result will always be "disgraced" i.e., "graceless" as a whole, being it disconnected from the history and the emotional reality of the environment, and will remain so for generations. The examples are innumerable.

A particularly striking and significant one, since the relationship between surface and subsoil goes beyond the literary metaphor boundaries and becomes a material problem, is the controversial construction of a motorway tunnel under the famous archaeological site of Stonehenge in England. Although the project has now been approved, the outcome is not yet fully defined at the time of this writing, as the protest wave is powerful and has taken on international dimensions. According to the project supporters, the construction of the tunnel will improve the site landscape and the environmental situation; since the road network around Stonehenge is very problematic, the intervention will "hide" a large mass of traffic, also ensuring a greater logistical and economic liveability to the residents. From the viewpoint of logical thinking, of urban living habits and the functioning of the most recent layers of the human mind, the reasoning is impeccable. On the other hand, according to the opponents, even if "you can't see it", the subsoil is an integral part of the site itself and the tunnel would irreparably denature it. Cultural and emotional dynamics belonging to the analogical and preverbal mental functioning are at play. History, even recent history, shows that neglecting or disqualifying them, apart from the damage caused in terms of overall mental health, is extremely dangerous on a social and political level. It is important to note that the protest does not only involve archaeologists, specialists and minorities bound to specific forms of belief, such as Druidism or other forms of

neo-paganism. Certainly, in some ways the protest is reminiscent of recent Native Americans' against oil pipelines and fracking, but it is largely different. While in the latter case, a marginalised and oppressed culture demonstrates that it has retained its clear and recognisable identity, its diffusion and its capacity for cohesion, in the case of Stonehenge everything is less defined. Not only the tunnel project contradicts a "common feeling" that highlights a "subterranean" link with the ancestral memories of individuals and communities; there is also a sense of alarm due to a looming *vulnus*, an irreversible wound that could be perpetrated with arrogance and superficiality. Finding a solution will not be easy, also because, in the writer's opinion, the alternative solutions proposed are part of the problem anyway, or at least an important component of it. Paraphrasing clinical psychology for a moment, it is reasonable to say that the tunnel issue is an unconcealable symptom of a wider problem, visible only to the extent that one decides to see and face it. This decision is far from obvious, as it has painful aspects. Many of the viability difficulties at Stonehenge are linked to mass tourism and its logistical and economic corollaries. While travelling and visiting distant places is an undoubtedly positive possibility no longer reserved for a small elite of people, the consumerist aspect that underpins much of mass tourism is a well-known source of serious problems everywhere, not just at Stonehenge. The consumeristic aspect of mass tourism obviously influences and modifies the places that are the object of it. Above all, it distorts the relationship with the places themselves. Let us ask ourselves some questions: does it make sense to visit a place like Stonehenge (and many others) in a consumerist atmosphere? Is there a quick and painless solution to this kind of questions, permeated by strong tensions in the relationship between the inner world and that of material needs, between the exercise of participatory democracy and the use of authority, between educational effort and tolerance of current mentalities?

3.4 Memory and reuse of built spaces

The presence of abandoned buildings, underutilized complexes, urban landscapes and voids, areas affected by natural disasters or armed conflicts characterize post-industrial cities and form a complex

palimpsest of memories, that Crespi defines as *leftovers* (Crespi, 2021). The peculiarities of these areas, mostly "frayed" compared to the regular urban extension proper to Euclidean geometry, distributed over the territory apparently without rules as a result of their abandonment, become possible models capable of recreating new physical and social aggregations, starting exactly from their degree of inhomogeneity. Self-resemblance characteristics can be applied to study and control the most advanced and complex urban systems, especially in the identification of hierarchies within those macro-areas that seem to have lost their character of rational unity. In their characteristic of ephemeral "temporariness and reversibility", no longer considered as random or isolated facts, they can constitute a starting point to overcome the no longer sustainable binary logic that subdivides the territory into urbanized or non-urbanized (Guglielmi, 2021).

Abandoned urban spaces are sometimes experienced by the population as an absence of meaning, a sort of missed opportunity for the city; at other times, occasionally characterized by valuable constructive and compositional features, they are part of a collective memory to which the population feels very attached (Fig. 10).

The conceptual and methodological boundaries between reuse and new construction are becoming blurred as contemporary architecture is often highly contextual and new buildings are approached as an intervention to their existing urban, rural, or natural context. A constant dialogue between past-present-future should be an obvious characteristic to reuse projects.

Presented since the 1960s as a valuable alternative to the construction of a new building, adaptive reuse is becoming an essential part of the design practice and a sustainable strategy to face the ecological challenge. Considering history in the service of creation rather than becoming a discipline for the accumulation of death information (Plevoets, Van Cleempoel, 2019), the designers' narratives and programs must begin by accounting for experiences of values. The traces of our past should be visited with fresh eyes, and interpreted to discover hidden potentialities for the future, much like recovering coral from the bottom of the ocean or extracting pearls out of ordinary looking mollusks. Traces of the existing architectures have been used in new design for centuries, incorporating previous structures and assimilating its syntaxis. This accumulation of references creates a historical fabric

full of tangible knowledge and intangible associations. Incorporating these traces of the past have helped to (re)animate a collective memory, a local atmosphere, or even a *genius loci*.

There is an intimate relationship between a given context – with its layered meanings, spatial conditions, morphology, materials, etc. – and the creative moment to transform it. It is precisely this performative relationship between tradition and creation that is of interest to design. Cultural heritage and contemporary works should be regarded as a single entity, in which cultural heritage must be protected and preserved, and the historical buildings, infrastructure and public space taken as a reference point for continuous spatial transformation and progress.

Fig. 10 – Unused historical building in Milan.

Environmental aesthetics research has shown that people often prefer historical places to modern architecture due to the sense of continuity they create with the past, embodying the group traditions and facilitating place attachment, which is intensified by awareness of the place history (Lewicka, 2008). In fact, memory and imagination contribute to the perception of the intimate quality of a place, in addition to that of climate and geography, inspiring daydreams and fantasies (Pallasmaa, 2014). Dwelling on the concept of fascination mentioned above, we can make the hypothesis that not only natural landscapes, but also historical, existing, decayed manufacts, rich in stratified memory may favour the reconnection with ancestral feelings, arouse strong emotional involvement and ties, producing a state of psychophysical wellbeing (Figs. 11, 12).

Fig. 11 – Reuse design of a historical building in Milan (Aloi Lorenzo, Deng qingyuan, Di Francesco Marta, Florenzano Federico, Pernisa Andrea Luca, Vallar Sara, Interior Design Studio, Politecnico di Milano, A.Y. 2020/21).

3.4.1 *Cultural centred reuse of urban spaces*

Different cities experience processes of urban regeneration, functional reconversion, requalification of disused productive buildings increasingly based on a cultural driven reuse practice. One of the most significant urban conversion projects in Europe is BASE in Milan, a former 12,000 square meters electromechanical factory, today transformed into a cultural production place used for workshops, exhibitions, conferences, bistro, study rooms and artist residences (Di Prete, 2020). Still in Milan, *Nuovo Armenia* is a cultural association created with the aim of enhancing multi-ethnic integration and eradicating the dominant narrative on migration; in collaboration with *Asnada* it has redeveloped a historic farmhouse located in Dergano, the second Milan district for the presence of immigrant population. Through a laborious process of restoration, cleaning and accommodation of the building, different populations of the neighborhood have been involved making the building finally available to all communities for spontaneous use. It has become the driver of cultural integration initiatives and "a creative hub for urban regeneration, a place of action and inclusion where creative production processes are activated with cultural and social service functions" (Di Prete, 2020). Another significant example is the *Farm Cultural Park* in Favara, a small town in Sicily, where some abandoned buildings have been redesigned through pop and contemporary aesthetics, hosting designers of all nationalities for conferences, events, lectures, reversing the economic crisis and the lack of human resources. Every street and courtyard looks like an urban interior, treated for size and sensitivity almost as if it were an architectural interior (Invernizzi, 2020).

3.5 Conclusion

To improve the built environment of our cities and villages, a holistic approach and a shared responsibility are needed, to foster vibrant and mixed neighbourhoods, protect the environment and generate positive relationships between people and places. The quality of the built environment deeply affects people engagement, is a crucial factor in social interaction and cohesion, in creativity, place attachment

and wellbeing. Reversely, people's quality of life strongly affects their relationship with places.

Looking at culture in the sense of the original Latin word *cultura*, which indicated to cultivate or to grow something in a soil, provides a good metaphor for where the idea of culture is trending today; if we refer to culture as attending of the human organism in its built and social environments, architecture effectively is the cultural medium in which our life sort of unfolds. This suggests that we should realign or rethink some of the priorities that we have about design, gaining new insights into how we engage with the environment on the emotional and the perceptual level, aesthetically as well as socially. We have the tools to really look at ways to build a new sort of cultural ethos which is focused not so much on the object of architectural design (which of course has to be well built and nicely detailed and exquisitely conceived) but more focused on the human experience of what this built environment is (Mallgrave, 2019).

Fig. 12 – Reuse design of a historical building in Milan (Albè Margherita, Baruffaldi Evelyn, Orlando Beatrice, Peruch Elisa, Richiello Ludovica, Roveda Filippo, Chiarelli Sabrina, Interior Design Studio, Politecnico di Milano, A.Y. 2020/21).

Approaching reuse design of urban abandoned spaces through a culture-centred approach and a humanistic point of view can allow people to benefit from memory, engaging atmospheres and synesthetic experiences, collectively shaping the places where we live according not only to functional, technical and economic requirements, but also to social and psychological needs, promoting urban regeneration and improving individual and community wellbeing.

Both because of the ambiguities and ambivalences of atmospheres as such, and because of the extent of the social and political issues inextricably linked to them, it is fair to say that those who allow themselves to be challenged by an atmosphere certainly run risks and have no guarantee that the result of their work will be touched by grace. However, similarly to what happens in human relationships, when an effort is made to meet, be curious, respect although without understand each other, even in the discomfort resulting from a lack of complete resolution, the result of the work will testify the presence of a positive tension, an attention to the common human that permeates every possible difference and dissonance. And this is already a precious step forward.

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4. Front door spaces. A time-based approach to the ground floor design

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Abstract

The time-based approach to design explores the chronemic dimension of spaces, based on chronotopes and temporal morphologies, not only spatial ones. This mode of research and analysis shows that the 20th century has predominantly been designed on the principle of "peaks of the curve", of maximum capacity, oversizing spaces instead of ensuring flexibility and adaptability useful in situations of minimum or medium crowding. This approach to design has produced cities that are compact in their buildings, but empty – over long periods of time – inside. The mono-functionality of some spaces has led to a system of short switching on and long switching off that is now unsustainable from an energy, social and economic point of view. From the urban to the domestic scale, there are spaces that we use sporadically and yet occupy territory. These are not large empty spaces, capable of hosting new projects, but "emptied micro-areas" that have the vocation of becoming buffer spaces, places of social and territorial reconnection, multi-scalar, and multi-temporal places available to local communities. The porous city absorbs criticalities, peaks, making urban and spatial structures less fragile and, instead, softer to transformations. A mapping of the emptied micro spaces, harnessed in architecture, shows that the most significant percentage will increasingly concern the ground floors of buildings. Starting with proposals such as Carlos Moreno's '15-minute city', passing through Superblocks projects in Barcelona and the Dutch policy aimed at 20-minute cities, it can be assumed that new models of time-based development will reshape cities in the

next decade. Ground floors can become empty places to be redefined: mending the relationship between the mobility of the street and the fixity of a building; guaranteeing an active lung for that walkability or slow mobility which dangerously tries to carve out its own paths; consolidating those neighborhood units that are more active online, rather than offline, encouraging those networks of randomness that the city has stifled by changing relationships and the sense of place.

4.1 Empty cities and mono functional spaces: peaks of the curve principle

Recent years have seen an exponential growth of large cities, which remain incredible magnets of attraction. Although the pandemic seems to introduce a countertrend, its effects are not yet visible. While cities have dramatically grown expanding their geographic extent, their urban centers underwent remarkable urban renewal actions and regenerations aimed at creating profit-driven spaces in which exchange-value overcame use-value (Álvarez Mora, Camerin, 2019). According to Camerin (2020):

these patterns have had remarkable consequences in terms of more inequality between people and territories, progressive destruction of the past legacy, inadequate management of the available resources, and gradual increasing pollution at a global level, with all its negative consequences for the human being.

The real estate value of cities with a strong attraction leads to an increase in commuting, with consequences not only on pollution but also on the use of the cities themselves. The so-called *users* with a functional relationship, unbalance the performance of the city to the detriment of the inhabitants who live there on many fronts. It is a city of peaks (of traffic, of assemblages, of congestion) which lead to a series of problems including the oversizing of services and of the relative spaces to satisfy the moments of maximum affluence.

It is a city of mobility without movement, that is, without awareness of, and a relationship with, the spaces it crosses, because the routes are regimented according to the logic of minimum distance, rapid speed and maximum control. Paradoxically, it is a congested

city, but full of empty spaces, which must redesign the forms of time that govern it (Barbara, 2012). The theme raised by Immanuel Kant, then by Jane Jacobs and finally by Richard Sennett, of the relationship between *villeand cité* and the need for reconciliation between time and space that can allow for openness, unexpectedness, inclusion, and external interactions, now returns (Sennett, 2018). It is the task of the 21st century to produce new forms of city, to use new media as tools for dialogue in spaces, to provide for slow movements and rhythms that can reconcile perception, emotion, and narrative.

It is in this new possibility that the ground floors, the spaces right in front of our homes, which for the last two centuries have been consigned to commerce, can reconnect the private world of residences with the public world of work and social life. The inhabitant takes up the place occupied for decades by the *consumer of places* (Barbara, 2018). The restitution of ground floors to the inhabitants, the revival of the social life they can activate, the reconstitution of communities, represent the revolution already underway that will transform the buildings and cities of the third millennium.

4.2 Swarm city

In its first twenty years, the digital revolution has often changed the ground floors of cities into places of blind traversal, relying on satellite maps and regimented routes instead of sensitive experience and spatial perception (Barbara, 2012). Walter Benjamin's poetic image of the flaneur has faded. In the *digital-driven city* there is no freedom but possibility, no randomness but causality, no proximity but intimacy. Individuals move like animals in the swarm following guided and simple behaviors typical of swarm intelligence (Xhemalaj, 2019). The ground floors of the digital-driven city are regulated by regular patterns within which people, vehicles and goods move, following a logic of repulsion (the individual does not get too close to his neighbors to avoid collisions); attraction (the individual does not move too far away from his neighbors to avoid losing cohesion); alignment (the individual moves in the same direction and with the average speed of his neighbors, to coordinate with them) interacting with other individuals in a sort of self-regulating principle (Xhemalaj, 2019). In the *digital-driven city*, in

the presence of strong external solicitations and stresses, humans move with pre-cognitive logics, very similar to those of animals, and consequently, the resulting collective behavior is analogous to that observed in flocks of birds or schools of fish (Xhemalaj, 2019). There are many models for prediction and modeling of the so-called *pedestrian movement* (Haklay *et al.*, 2001) that focus on certain parameters such as the scale of the environment considered, moving from the micro-scale in which it accurately represents the avoidance of two people crossing each other during their movement, to the macro-scale in which it represents the flows of entire masses of people in motion. When the number of people considered increases considerably and their concentration relative in the environment is very high, this type of modeling also takes the name of crowd simulation which considers microscopic models, macroscopic models, and mesoscopic models (Xhemalaj, 2019). These modeling are used to identify local recurring behaviors in pedestrians under digital-driven or crowded conditions.

The reason why it is interesting to understand the logic of movement in the *digital-driven city* is because the door-front city seeks to reconcile urban and digital behaviors, in a way that moves away from the logic of the individual, but also away from that of the typical crowd. This reconciliation happens for example by reducing vehicular speed; promoting slow mobility that can increase lateral interactions and not only frontal ones; walking on foot, to get more liminal visual information compared to the ones you get while moving by car or bus (i.e. according to Sennett (2018) it is estimated that the brain can process 50-55% more lateral visual information); trying to use digital devices to coordinate spatial/temporal interactions. When the crowd transforms into a collectivity, with conscious connections to others, when it ceases to be a dusting of individuality, and enters a relationship with others and places, then the ground floor becomes a privileged site of a *collective intelligence*. Pierre Lévy defines collective intelligence as "an intelligence distributed everywhere, continuously enhanced, coordinated in real time, leading to an effective mobilization of skills" and identifies as its foundation and purpose "the mutual recognition and enrichment of people".

This concept is the postulate of the thought: *no one knows everything, everyone knows something, the totality of knowledge resides in humanity* (Xhemalaj, 2019).

4.2.1 Time-based design and the porous city

City infrastructures continue to suffer from peaks in demand. Nine o'clock commuters clog the roads, causing traffic jams and accidents. The same happens at lunchtime or on the way home in the evening. The work flexibility we have found in the months of Covid-19 presents us with a unique opportunity: that of rescheduling our schedules wisely, to avoid overloading the city's infrastructure.

In the last few months, many of us have started to move around staggered, going to the office on alternate days and times. As well as reducing the risk of contagion, this practice allows us to better distribute traffic flows. Software to reduce taxis and cars: this is the *Minimum Fleet* project presented in 2008 by researchers from MIT, CNR and Cornell University. With an algorithm, half as many cars could be used in New York as now. It seems clear that one of the problems of the contemporary city is therefore the rigidity of the temporal and spatial models available. Today, our city is still like an inelastic container. Once there is a new growth in internal demand and activities, the original urban space cannot be accommodated and overflows the container like water. The answer couldn't be to let the volume of the city continue to expand (area, height, depth), and constantly create new space to meet these needs. Porous spaces, like a sponge, absorb and release while maintaining their shape (Zhou, 2017; Sennett, 2018).

Considering the porosity of built spaces means ensuring saturation and desaturation of activities by following practices of temporal scheduling, or space sharing. For this reason, the idea of a porous city has its own charm. It was a very effective concept introduced by Walter Benjamin for Naples and subsequently taken up by others: within the urban fabric there are marginal and abandoned public spaces, real fragments of the city. In a perspective of urban regeneration, they can be seen as new opportunities for the city of the future. The city is in fact like a sponge, full of empty or emptied spaces, i.e. temporarily free from the intended functions. Precisely this potentiality of available spaces, depending on the timetable, provides empty spaces that serve as areas of compression and flexibility in space and time. We can therefore understand that it is not only the urban void as opposed to the built-up area that is the meeting place, but often it is precisely that void harnessed in the solid mass of the built-up area that guarantees dynamism and life.
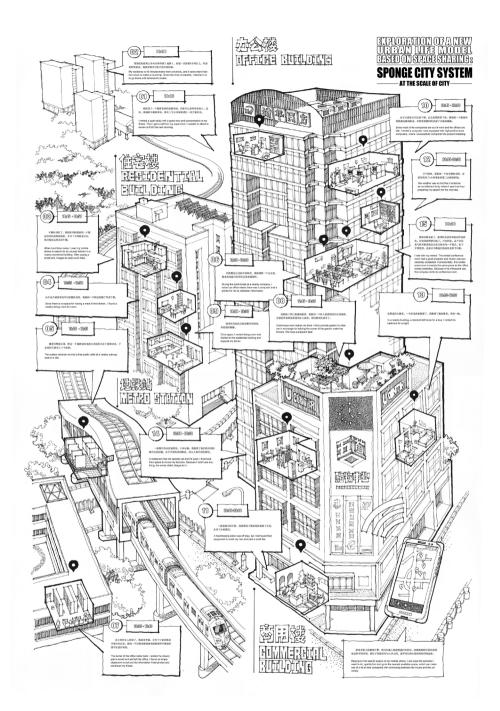
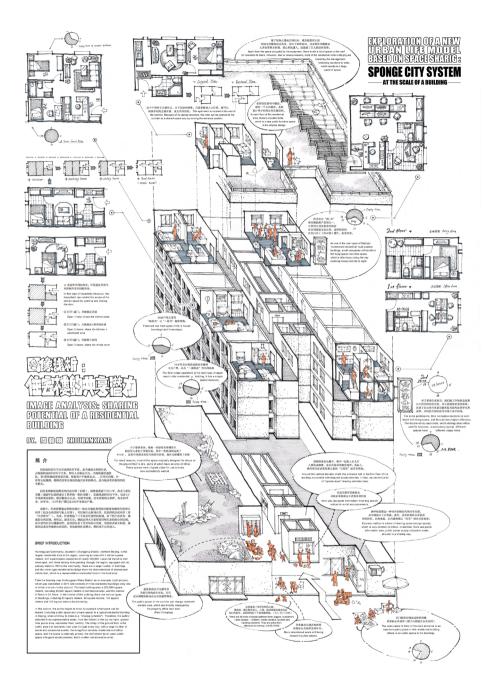*Fig. 1 – Representation of the porous city by Zhou Hanxiang*

Fig. 2 – Exploration of the potential of a residential by Zhou Hanxiang

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The housing stock built over the last hundred years, based on single-function, single-period buildings, is now unsustainable. A new culture of reuse and regeneration at the center of new urban projects that question how to build new relationships between the parts. Buildings must be designed to be adaptable over time, and even when closed they have an energy, social and economic cost.

A school that is empty at night, or a subway station that is deserted for 90% of its time, are forms of unsustainable waste. The dimensions of the spaces of the contemporary city have been measured according to a single time, which produces the principle of maximum crowding, congestion so the rest of the time, they are empty or underused.

Considering the city as a sponge, the policy of public and private spaces must start from small-scale territorial strategies: an approach that considers that local development hypotheses in these situations are successful when they move small numbers over a series of projects, rather than a single large project or a single major work, in a context where monitoring of phenomena is unprepared to report small variations, or fast variations, in small quantities. This is the strength of the sponge model, which does not leave large urban voids, but small interventions, with great temporal flexibility and spatial and environmental compatibility. The post-urban context has generated a new culture of reuse and regeneration at the center of new urban projects that question how to build new relationships between the parts, using the connective void, in an environment also characterized by the shrinking city. The idea of a porous city, which exploits interstices as well as temporarily unused spaces, is not a new idea in the history of architecture, urban spaces, and interior design, but today it is feasible because of the sharing culture and the possibilities of management and control due to APPs and digital platforms. Time should also be considered in an intercultural key. In fact, it recalls Edward T. Hall, for whom time is the heart of our lives, around which we build our image of the world.

If the time systems of two cultures are different, everything else will be different (Zucchermaglio, 2016).

Because every culture, but also every social group, produces its own time, which may consist in the organization of its own agenda, its own work, but also in the celebration of rituals and holidays. Monochronic

societies are more fragile than polychronic societies that provide the possibility to do several activities simultaneously, but also to use space simultaneously for compatible but different activities.

But right now, because of the digital revolution, we have entered a phase of co-presence of both monochronic and polychronic times.

If a monochronic view of time, in addition to being a mainstay of societies strongly forged to economic profit, risks overflowing into manic and neurotic forms or, at best, into what is simply called stress, the polychronic one risks proving to be dispersive and perhaps inconclusive (Zucchermaglio, 2016).

4.2.2 From the neighbourhood units to the 15-minutes cities

The problem of the extension of cities and the consequent complicated relationship between parts that are too far apart, goes back to the Roman Empire and the size of its colonies. Already at the end of the XIX century were born the garden cities, theorized by Ebenezer Howard, as satellites to the first metropolises. The term *neighborhood unit* was first used in 1923 in a national architectural competition in Chicago as a proposal for a layout to build new compact residential neighborhoods. The idea was to counteract the growth of major industrial cities which, with the advent of mass motorization, risked expanding uncontrollably and generating anonymous and increasingly remote suburbs. The phenomenon of creating satellite cities continued with the English New Towns and the French Ville Nouvelle that would serve to decongest traffic, entering and leaving large cities, and allow a fleet of commuters to move shorter distances between home and work.

In 1994, an Italian physicist of great value, Cesare Marchetti, published a revolutionary study ("Anthropological Invariants in Travel Behavior"): he showed that our daily movements do not depend so much on economic reasons as on an instinct that has remained the same from the cave age to the present day. That instinct translates into a kind of time that we are willing to devote to our daily commute: half an hour to go and half an hour to return home (or to the cave). That time is called the *Marchetti Constant* and it basically says that as transport has progressed, the time for travel has not been reduced, but the distance has been lengthened. Obviously, there are exceptions, we are talking

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about average values, but it was on these average values that the ancient cities were built, which in fact had a diameter that could be covered on foot in an hour; and the megalopolises that you can cross at the same time but on fast subways.

The environmental crisis demands a new organization of the city that must be more sustainable and viable. The pandemic has also prompted us to rethink the way we live in cities and move around in public spaces. There is also an urgent need to address the new individual and collective feeling of social loneliness and the acceleration of time.

Ecology, proximity, solidarity, and participation are the words behind the transformation. We must aim for a more pleasant urban life, agile, healthy, and flexible, so that the suburbs can have access to essential services and every building in the neighborhood can be used for different purposes. Schools, in this design, become meeting points for the neighborhood in the evening, digital labs must be in parks to be shared, because digital transformation is also a key element in this context. These are mainly the words that Carlos Moreno, professor at Paris-I University, used for launching the idea of a "15-minute city", in which all services would be available to citizens at a maximum distance of 15 minutes by bicycle or on foot. The reasons for this are obvious: the first is ecology, the reduction of pollution; the second is the quality of life, the time gained; the third is the possibility of creating stronger links between people; the fourth is to give a new meaning to the suburbs, an issue of justice and social cohesion. Accordingly, it clearly turns out that the "15-minute city" really wants to integrate time and space into its high-quality living strategy.

The "15-minute city" was one of the points in the electoral program of "Paris en commun", the political platform of the mayor Anne Hidalgo, who was re-elected to lead the French capital in 2020 summer. The Parisian mayor's idea is a reference to the concept of the "Intelligent Human City".

According to Moreno (2021) we need to:

rethink the concept of proximity, articulating it around the six functions that each neighborhood should guarantee: living, working, providing, caring, learning and having fun.

These are radically different concepts than in the past, and therefore imply a questioning of urban planning. It is important to start decon-

structing cities, thinking differently than in the 1990s when we believed that we would solve the problem of spatial fragmentation by using technology, which would allow us to go faster and farther.

It is a model that seems to be inspiring Milan as well. Believing in the "15-minute city" means guaranteeing citizens all primary services within a quarter of an hour on foot or by bicycle. So, it is necessary to improve infrastructures, reserve a portion of housing for social housing, create small, cohesive, and intergenerational neighborhood communities, and re-appropriate all those spaces on the ground floor of buildings, which represent the natural interchange between private space and the city. In fact, the lockdown showed the importance of being able to rely on a system of territorially distributed redistribution of services and neighborhood sociality (Manzini, 2021).

For Ferri and Manzini, on the other hand, unprecedented social forms are emerging, looking to the future: i.e., hybrid, material, and digital communities; environments made up of places with variable geometry, whose boundaries are no longer physical but are amplified by technologies.

Ezio Manzini, also stress the difference between the new vision of the 15-minute city and the concept of the city as a sum of suburbs. The key is what they call "cosmopolitan localism".

The 15-minute city must not only be the place of the short networks of everyday life, but also the place where the networks of short distances on foot or by bicycle connect with the long ones, whether they are for work, culture, or study (Manzini, 2021).

Concerning other neighborhood-centered approaches 15-minute cities mainly differ in the intention to move activities to the neighborhoods instead of forcing people to reach the activities, restoring the concept of *proximity* (Pozoukidou, Chatziyiannaki, 2021). Thus, there are a range of proximity-centered strategies aimed at enhancing people's local access to a consistent and heterogeneous range of comforts and amenities relevant for quality of life. Those strategies are strongly different from accessibility-centered ones.

Apart from the critical design principles, "15-minute city" aspires to engage an inclusive and egalitarian approach to planning such as to achieve socially sustainable urban environments. Sustainability of community is highlighted as an important feature that should be built

through equal access to facilities and opportunities, local social interaction, participation in local community activities, community stability, pride of place, sense of belonging and feeling safe and secure. The notion of inclusiveness refers to basic urban services and amenities that include access to quality affordable housing, mobility infrastructure for all ages and abilities, affordable transportation options, equal opportunities to employment and education, and the right to lead a healthy life (Pozoukidou, Chatziyiannaki, 2021).

Finally, 15-minute cities are intended to be urban environments that would enhance opportunities for resident interaction in neighborhood public areas, such as sidewalks and open spaces, and front door spaces encouraging a sense of connection, familiarity, and a sense of belonging (De Valderrama *et al.*, 2020). With many benefits, starting with the re-appropriation of one's own vital time, thanks to the drastic reduction of hours wasted in long journeys, traffic jams and queues in the metropolis.

It is time to move from urban planning to urban life planning. This means transforming the space of the city, which is still highly mono-functional with its different specialized areas, into a polycentric reality, based on four main components – vicinity, diversity, density, and ubiquity – to offer the six essential urban social functions at a short distance: living, working, providing, caring, learning, and enjoying (Moreno, 2021).

According to Skinner and Masuda (2013):

the right to a health city means to guarantee the access to essential opportunities for health (e.g., social support networks, grocery stores, health services), and/or obligations (e.g., employment, education).

4.3 15-minute cities worldwide cases

In Italy, Milan was the first major city to adopt the "15-minute city" model of future development. The pandemic has forced Milan, like all big cities, to reevaluate its future. In the Lombard capital, the real challenge is to create integrated residential neighborhoods outside the central area – in which housing, offices, factories, public services, and green spaces coexist – also to reduce work commuting and contribute

to the decongestion of public transport and traffic at peak times. The polycentric development of the city would make it possible to move beyond the division between downtown and suburbia to produce a greater intrinsic balance among all the different neighborhoods.

The municipal administration is supporting citizens' initiatives with various actions: from supporting local shops, which are also social centers, for supporting the creation of coworking facilities. A 'time-based' approach is needed to make possible this transformation into a '15-minute city'. The first initiatives underway have, in fact, entailed the expansion of the time-based offer and the physical location of public and private service provision places, also favoring digital use, the strengthening of public services with a view to proximity, balancing the differences between neighbourhoods and reducing travel, and the redesign of services developed by looking at the best experiences of different areas and geographies. The participatory and inclusive decision-making process for local communities is facilitated, in the case of Milan, by local associations and collectives linked to neighbourhoods.

Since its penultimate Urban Mobility Plan (2013), Barcelona has also embraced a concept similar to Moreno's "15-minute city", designing so-called "Superblocks": neighborhoods of nine pedestrianized blocks, where traffic is restricted to major roads around the outside with access for only a few authorized vehicles, which represent small communities within the city and which are linked and interconnected to other urban blocks by external connecting roads. The aim is to reduce pollution from vehicles and give residents much-needed relief from noise pollution. The original project is being implemented with the participation of residents, associations, organisations and groups, as well as City Council experts and technicians. In fact, participation is open to anyone who is interested through meetings, events, activities and workshops, as well as the "decidim.barcelona" platform.

The city rolled out the pilot projects in 6 neighbourhoods with adequate intervals to better refine the public participation process. The goal is to encourage social cohesion and collaboration. For example, during the project experimentations, new practices such as green roofs, water harvesting, rainwater management, and tree plantings are significant. All those initiatives were proposed directly by citizens and inserted into the "Superblocks" agenda. Concurrently, new flexible uses

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for terrace space and a usage plan to safeguard against an excess concentration of similar establishments has also been considered. In addition, it would give room for diverse and multipurpose uses. Also, fewer vehicles and more people on the lanes would ultimately attract attention towards local business and increase potential retail success.

Some have been moving in this direction for years. Recent studies carried out in the Netherlands have shown that, thanks in part to a proactive model of spatial planning that has been in place for years, more than 80% of Dutch urban settlements now comply with the characteristics of the "15-minute city".

Outside Europe, it is the city of Sydney, in Australia, which for some years has been proud to be a 20-minute city, highlighting how this concept of urban space is leading to an improvement in both the environment and the quality of life of its residents.

Similarly, in the United States, Portland (Oregon) has created 20-minute neighborhoods, mainly for pedestrians, which are the cornerstone of the actions promoted by the city to combat the current climate crisis. It consists of the deliberate and measured creation of zoned areas that ensure residents have everything they need to live, work, and play within a twenty-minute walk of their homes.

Originally coined in Portland, as the "Portland Plan", the initiative ties in with the Oregon city's climate plan, whereby by 2030 90% of residents will be able to easily walk or cycle to any needed service from home within twenty minutes. The Portland Plan focused on promoting prosperity, reducing carbon emissions, and ensuring that education, health, and equity benefit. The "Melbourne Plan 2017-50" in Melbourne, Australia, is a similar long-term planning strategy, through which the traditional separation of work and private life is blurred and brought closer together. Through the decentralization of the city as a major service and employment center, and as a space for social connection, each neighborhood is enabled to encourage active mobility, accommodate different types of housing, provide affordable housing, provide playgrounds, schools, hospitals, retail shops and ensure access to sport and recreational facilities. Both approaches focus on creating healthy communities by putting the emphasis on the health of their residents. At the heart of the 20-minute neighborhood concept, there are five fundamental principles: connection, community, locality, health, and growth.

Giving people and their needs a primary role, it will be the intention of all planners to consider the psychological effects of not just feeling connected, but of being properly connected through services, green spaces and opportunities to actively walk.

The Swedish "Street Moves", also known as "1-minute-city" (O' Sullivan, 2021), and the Milanese experiment "Strade Aperte" which strictly relied on the "tactical urbanism" program (Comune di Milano, 2020) are two outstanding examples. The Swedish "1-minute city" combines the famous Parisian "15-minute city" with the concept of a pedestrian island. At the heart of the project is a vision: to make every street livable, ecological and clean, moving cars away to make room for citizens, their interactions and a more vibrant community life, converting car parks into meeting places with tables, chairs, benches and flowerbeds where people can safely meet outdoors. To encourage light mobility, grids are also installed for parking bicycles and electric scooters. The first trial started in Gothenburg, near a small shopping district. The new public spaces have won the hearts of Swedes: according to initial surveys, 70% of citizens are in favor of the transformation. The Swedish "1-minute city" also responds to the increasingly pressing need, due to the climate crisis, to reduce the role of motorized vehicles in daily life. It is a city to be lived slowly, at a walking pace, and facilitates the creation of a cohesive community.

The space in front of your front door, be it an apartment block or a house, is where you can have authentic and lasting relationships (Hill, 2021).

The "1-minute city" is an ecological city, to be lived slowly, at a walking pace, with the precise aim of recreating a sense of community among its inhabitants. Accordingly, the "1-minute city" is an experimental urban model based on the idea of the "15-minute city": the concept reimagines urban space at a hyper-local level and involves the citizen in their environment. Unlike the "15-minute city", the idea here is not to meet all the needs of a community within a 1-minute radius. Rather, it is to give the inhabitants of a neighborhood, the choice of how to use the urban space. The idea is to give a space with multiple potential uses to the inhabitants who live in the district, by building wooden modules, with various sections. It is up to them to decide, according to

their needs and desires, the form that these wooden modules will take. A green space, a meeting place, a playground for children, a parking lot for bicycles or scooters, the possibilities are endless.

On the same way, the milanese plan "Strade Aperte" calls for the construction of a network of 35 kilometers of cycle paths and pedestrian routes within the city streets, all at low cost. Strade Aperte encourages environmentally sustainable transport alternatives to the car (bicycles with pedal assistance and electric scooters), 30 km/h speed limits and priority roads for pedestrians and cyclists, as well as playgrounds and squares co-designed with local communities. The plan exemplifies the implementation of pilot projects in the Lazzaretto and Isola areas, with temporary pedestrianization of some streets, widening of pavements, establishment of 30 km/h zones, installation of terraces and green areas. Indeed, since September 2018, the Municipality of Milan has launched a program defined as "tactical urbanism", consisting in the creation of new public spaces in place of redundant streets or intersec-tions, with temporary and reversible solutions.

Another project is MOST (Migration Over the Satellite Town of Pioltello) funded by the Polisocial Award program of Politecnico di Milano, in collaboration with Milano-Bicocca University and Statale. "This is a social integration and urban regeneration project based on citizen involvement. The goal is to create a sense of belonging and attachment to the neighborhood by using some abandoned stores and premises on the ground floor of various buildings in the neighborhood".

The so-called social stores have been opened, called with names that express the objectives and needs of the neighborhood: "Work" to aid the active search for work and support self-entrepreneurship; "Do and Wish", to give space and tools to the creativity of citizens, especially the youngest, in the action on the territory, for example the organization of events and social initiatives (Inghilleri, 2021).

4.4 Front door design approach

The post-covid era, considering the new urban policies looking to experiment and establish "15-minute cities" models, has kick-started a change that mainly affects the ground floors of our cities.

Barbershop – kebab restaurant – hairdresser's shop – fruit seller's – discount – nail shop – veterinarian – pharmacy – watchmaker's shop – Chinese bar – laundry – bakery – soap supermarket – stationery outlet – etc. The ground floor of buildings is often a commercial sequence, into a market logic that have transformed citizens into consumers for decades. Today, in the post-covid panorama, that sequence of shop windows is an inexorable sentence of failure, of closures, of decline of a consumerist paradigm of the city as a single, widespread market.

The time is ripe for on-demand online shopping, with home delivery services in 10 minutes: a growing phenomenon, as is proximity logistics, which goes beyond food, or initiatives such as 'shopping districts' in which a few essential neighbourhood shops network, including digitally, to offer services and consumer goods to the inhabitants of the local community. It is here that the ground floors can become empty places to be redefined.

Accordingly:

– the relationship between the street, the plane of mobility, and the building, the plane of fixity, not only architectural and urban, but also social, would be mended;
– the ground floors could be an active lung for that walkability or slow mobility that dangerously tries to carve out paths between the running cars;
– it would be possible to consolidate in the front door city those neighborhood units that are more active online than offline;
– it would favor those networks of randomness that the city has stifled, changing the relationships and the sense of place;
– it would increase the sense of security, belonging and attachment that are fundamental conditions for inhabiting public places.

Slow mobility linked to a 15-minute magnitude requires the redesign of ground floor spaces, which have been cannibalized by commerce for too long. It is precisely this invasion of ground-floor spaces by trading the cause of the transformation of citizens into consumers, of the city from a place of relations into a single large market whose exchanges were regulated by market laws and not by social rules. Only slowness can sustain the natural times of a commu-

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nity, made of informal relationships, rituals, customs… far from the rapidity of online communities. Temporal slowness, which produces casualness, is that of free and varied ground floors not only devoted to shopping. Rooted communities, those that build a physical relationship with places, need slowness and time to sew "vis-à-vis" relationships (Jacobs, 2000).

The social architecture of the 60s and 70s had introduced in the buildings the idea of common spaces, condominiums, aimed at being collectors of relations, services and collective activities. In the 1980s these spaces were rented out, made productive according to a market logic that enticed the trade and marketing of locations.

We need to re-occupy the ground floors, make them productive with a view to a social economy and not exclusively financial. We need to give back to the city and the community the qualities of those places that can mend the idea of proximity, of neighborhood, of social mandate. In the section of buildings, the connection with the ground line must be sewn up. For too long the ground floor has been an impenetrable threshold, a caesura between private and public that functionally supplied one and monopolized the other.

It is by following the smaller order of magnitude, of the "1-minute city", that think-local planning pays attention to "the space outside your front door, and that of your adjacent neighbors and across the street," precisely the front door city. It has as its idea that the spaces just beyond the front door are ideal places for cities to begin to develop new, more direct ways of engaging with the public. They are a filter and a portal to the wider world; the atmosphere they generate and the infrastructure they provide are tools for the transformation of the community itself. In fact, what is happening is that communities are bringing ground floors, redesigning streets and parking spaces and seating, and reclaiming the indoor and outdoor ground floor.

Ground floors are a great place to engage on the level of people's daily lives.

It is difficult to conceive of a new political imagination igniting without open and generative street cultures (Hill, 2021).

According to the cases, the re-appropriation of neighborhood public space paves the way for redesigning the ground floors of build-

ings, especially the intersectional area of the front door: filter spaces, between the private spaces of our houses and the neighborhood, the 15-minute city in which we will live in the near future.

4.5 Variables of success

Although this approach is recent and the impacts on the city, on the communities of inhabitants and on the circularity and sustainability of services are being measured, it seems clear that these models of urban proximity, of sustainable and widespread use of indoor and urban spaces on the ground floors, can increase the level of engagement between spaces and communities.

The first studies show the existence of some parameters, which also allow to measure both the involvement of the inhabitants, the increase of the quality of life, the reduction of pollution, etc.

From the design workshops that we hold at the School of Design of Politecnico di Milano, as well as from the literature and urban practices that we have studied and even co-designed in some cases, it is clear that it is necessary to find indicators that can demonstrate unequivocally that the direction traced by these projects (at the scale of 15 minutes city or neighborhood or the city of ground floors) leads to an idea of sustainability that is not paternalistic, that is not recessive, but proactive and improving for all.

We can already begin to extrapolate what are the parameters that demonstrate the success of door front city design approach:
– reduction in travel by private vehicles in favor of public transport, walking or cycling. Due to the efficiency of multi-modality of shared vehicles compared to traditional automotive transportation, but also due to the convenience of using shared vehicles compared to owned vehicles;
– improvement of the air quality and noise pollution due to the absence or reduction of car traffic. The measurement of micro-environmental quality, which often reaches dramatic values on the ground floors, shows an improvement in the air and a reduction in particulate and VCOs. Consequently, it encourages the use of public spaces also near the main roads that reduce traffic peaks;

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- more green spaces will encourage people to be outdoors and lead more active lifestyles. The presence of greenery, combined with the reduction of traffic and pollution, becomes value of encouragement to the use of public spaces with consequent protection and increased maintenance of spaces;
- reduction in obesity and diabetes and consequent easing of pressure on health services. As a result, people are encouraged to go outside, to stay outside, to explore the neighborhood, to get active but also to take ownership of the spaces as a common asset;
- combined monochronic and polychronic use of spaces and simultaneity of activities. Thus conceived, the city also begins to explore different temporal dimensions. There is no longer just one time, one community or one productive system, but the city becomes polyphonic, able to accommodate different chronologies, different cultures and chronemics, different forms of living. The hours of the day and night are explored, and spaces open up to simultaneity and the inclusion of heterogeneous communities and activities;
- unprecedented importance of sidewalks, not only in terms of crowding and presence indices, but especially in the correlation with living on and off ground floors and the opportunity they offer designers to design props that facilitate aggregation rather than segregation. The sidewalk becomes not only the place of flows, to be conveyed and fluidized, but also the place of different speeds, of lateralities, which allow unexpected movements, individual, but also groupings and moments of rest. It is precisely that part of the front door city that stops being a threshold and becomes a widening, a square, a place for interaction;
- increase of walking or moving slowly as an action capable of generating lateral knowledge that increases the cognitive, perceptual, and emotional level of the city;
- increase in personal satisfaction intersected with the social level, defined as psychosocial dynamics of "deep democracy" that leads to "psychological citizenship", also defined as "networking flow", when it manages "to combine psychological wellbeing of the people involved, social interest of communities and success, even economic, in the achievement of objectives" (Inghilleri, 2021).

These reflections are confirmed, and sometimes almost coincide, with the parameters that Arup Office, one of the most international

firm of engineering, considers barometers of the contemporary city experience. This is important, because until now, these were considered guidelines formulated by enlightened public administrations or by citizens' associations that, at best, were able to activate co-design projects. However, the fact that one of the world's most important design studios grasps these as project values, means that a breach has been opened, even in the heart of the most globalized design, and real estate stakeholders are beginning to consider the quality of ground floor spaces as essential economic values for the quality of the cities they build.

1. Focusing on walkability. Making the city more walkable by measures such as pedestrianizing shopping streets, planting more trees to provide shade, and providing more benches and public toilets. Walking has been shown to make people happier and reduce air pollution. And a walkable neighborhood increases the informal interactions between people, building ties among neighbors.

2. Rewilding the city. London has its share of major parks, but not everyone lives within easy reach of those. Greenery has an important role in making cities more resilient, both by providing residents with a respite from tarmac and concrete and offering shade, natural flood defenses and cleaner air. There are many things a city can do to bring green spaces to communities. In Liverpool for example, modular parklets using street furniture and planter have provided more greenery.

3. Creating public space for play. We should be looking to maximize the opportunity for play. It's been shown that child-friendly cities are friendlier places for everyone. Playful encounters can be built into everyday journeys through interventions that give objects purpose beyond their primary function and foster curiosity. Examples include playful bus stops, public art projects or pocket parks such as the Urban95.

4. Multifunctional space. In densely packed cities like London we need to look to re-use existing or outdated infrastructure such as car parks, school grounds or community hubs for neighborhood activities after hours. Or looking to temporary facilities, such as Kings Cross Central in London set up during its redevelopment-including an open-air swimming pool.

5. Creating digital twins. The ability to build online cities in parallel with our physical cities is within our reach. It allows us to model

and test ideas that could ensure all developments help contribute to making urban life more enjoyable for communities by helping with everything from reducing air pollution to connecting people with green spaces. Digital twins allow the real-time simulation of cities-enabling policy makers and urban designers to test different scenarios and identify risks and opportunities. Crucially they will allow communities to fully understand the impact of different planning decisions.

In conclusion, we could hope that cities will change in the coming years in the direction of environmental, but also social, spatial, and temporal sustainability. Digitization will be a service to the city built to open private spaces and re-occupy public ones. Door front city is the one that will have to give us confidence, precisely because it is in front of our doors, because it is a space that belongs to us and that we will have to take care of every day.

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5. Experiential ways of mapping: revisiting the Desktop Walkthrough

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Abstract

Design has formed as a professional field, over time, in relation to social, political, cultural, and industrial transformations. In this process, the ways that designing itself is carried out have responded to these changes as well. There is not one singular way of doing design. The varieties of tools, methods, materials, and situations that design now engages with spans from practices that are well-established since more than a century, to emerging and experimental endeavours that contribute with new approaches and methods. However, attention to the historical origins of design methods is seldom present in contemporary design practice. Instead, methods and tools seem almost timeless, if not neutral. Design's ways of working are generally not framed in relation to the diverse historical contexts, constellations, and cultures in which they once were formed and introduced. Embedded in the methods applied in design today, however, we can still find traces of the historical situations, concerns, and ideas that they once were made to respond to. An awareness of these embedded historical aspects of designing can bring forth perspectives that support developing what we do in design, and how we relate to the methods that we use. The point of attempting to map a certain design method in relation to its history, therefore, is here not intended as simply a matter of tracing a linear historical genealogy of from where and how this method has come to enter design practice. Through an attention to the historicity of designing, we wish to point to a complex cartography of multi-level relationships between different design practices, diverse conceptual

understandings of design, and various trajectories that designing could take towards the future.

In this chapter we revisit a specific method used within design projects that deal with integrating spatial and service design solutions, the desktop walkthrough. Through exploring its possible connections to and relationships with previous experiential ways of mapping spatial and environmental interactions, we wish to move beyond discussing what such a method instrumentally "does" and highlight some of the embedded historical and conceptual understandings it brings into designing.

5.1 Design methods and the evolution of practice

Design processes, approaches, methods, and tools have evolved over time, creating specific narratives and geographies of designing that have become embedded in design practice. Practitioners and scholars have influenced each other along the way in both maintaining and developing design methods and processes. Designing has on the one hand built on tradition – ways of doing and thinking passed on from one generation to another – and on the other on intentionally innovating designing through bringing in methods and tools from fields external to design (complementary, adjacent, intersecting or far from the field). From the latter decades of the 20th century, 'designing designing' (Jones, 1984) has increasingly become a focus for design practitioners and design scholars alike. As new materials, new contexts and new collaborations have been established as relevant for design to engage with, the invention and adoption of new methods and tools for design has come to hold a central position in developing design as a professional and scholarly practice.

Despite this strong presence of methods development in design, the attention to the historical roots of different design methods and tools is very limited (Göransdotter, Redström, 2018). In design, focus is on the future rather than on the past. The question is what different methods may support in terms of results and insights that lead to a successful design outcome, rather than questioning why and from where these methods once have sprung, and what that might mean for their inherent limitations and possibilities.

In contemporary design, it is often difficult to map when and from where different design methods and tools actually were introduced. In some cases, one can follow a method's development trajectory over in various publications – as, for example, the various ways in which the HCI community has interpreted the method of cultural probes through adaptations of its application within different contexts (Gaver *et al.*, 1999, 2004; Boehner *et al.*, 2007).

In the case of cultural probes, it is interesting to see how Boehner *et al.* (2007) have shed light on how these have been adopted and adapted in a proliferation of situations, with divergent uses and scopes. In an attempt to clarify the relationship between methods and their underlying methodology, the application of cultural probes was investigated with regard to how different researchers had responded to the work of Gaver *et al.* (1999), adapting the understanding of their work to their own needs. The main issue was that "some uses of probes had been criticized as poor substitutes for ethnographic and other methods for generating qualitative analyses of the practices of everyday life" instead of building further on the intended experimental and subversive nature of the method, which was originally inspired by a Situationist approach to experimental art.

As cultural probes became a method made part of a 'design toolbox', the original intent of *why* this method was developed and introduced became diluted leading to a "striking (…) extent to which some attributes of the original cultural probes have been broadly left behind" (Boehner *et al.* 2007, p. 1080). As the method was distanced from its contextual coming-to-be, it often became operationalised as an instrumental tool for adapting design outcomes to user needs rather than applying it as a method for opening up more imaginative and 'irrational' design spaces. The authors point to the shift in focus that follows when a "method" such as the cultural probes is detached from its methodological framing and applied instrumentally without connecting to its original aim and context: "For instance, the attraction to 'design-y' methods and results but discomfort with the corresponding value of uncertainty leads to an overwhelming desire for codifying a design approach into easily-reproducible methods, or research recipes" (Boehner *et al.* 2007, p. 1084).

This brief example around the case of cultural probes serves to exemplify a tendency that can be extended also to other practices and

methods in design, that over time have gone through different stages of interpretation and adaptation. But the lack of literature documenting the historical origins of different design methods and opening epistemological debates on their application leads to the acceptance of a "general toolbox" without any real traces of why, where and when design methods entered designing. Gradually, these methods become part of design educations, handbooks, and professional practices. The methods somehow just seem to be there, stable and reliable, adapted to certain purposes and ready to use (Stickdorn *et al.*, 2011).

Tracing trails of why and where design methods once have come about is of importance for the evolution of design itself as a practice and as a discipline. Unpacking the original thoughts and circumstances that led to the development of a method or tool contributes to making visible aspects of design that have so far not been addressed, neither in design nor in design history. Even more so, this activating of the historicity of designing can also open spaces for critically re-thinking what design can become (Göransdotter, 2020; Riccini, 2001).

A critical view on methods development in design as on the one hand necessary for exploring new ways of designing, and on the other simultaneously at risk of contributing to fossilising or stabilising certain understandings of design, was adopted already by proponents of the Design Methods Movement of the late 1960's and early 1970s (Jones, 1970; Alexander, 1964). Looking back at these attempts to develop new methodological and processual approaches in designing, John Chris Jones called out the tensions between methods innovation and methodological fossilisation in relation to design's aims and outcomes already in the 1980s:

A time for relearning.
Ten years later [from the Design Methods Movement] we realize that, as makers of methods, we have got lost.
The situation created by what we did, and by the reactions to it, does not allow us to proceed. We are obliged to pause, to rethink, to discover what went wrong. The obstacles that now confront us give us the opportunity to relearn, to develop, to grow. To give up whatever it was that led us astray…
[…]
We sought to be open minded, to make design processes that would be more sensitive to life than were the professional practices of the time. But the result was rigidity: a fixing of aims and methods to produce designs that everyone

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now feels to be insensitive to human needs. Another result was that design methods became more theoretical and many of those drawn to the subject turned it into the academic study of methods (methodology) instead of trying to design things better. […] though we saw the need to change the processes of designing we did not see the need to change its aims. We retained the concept of 'product' as the outcome of designing. We did not see that we were accepting only a part of the challenge which we took up: the challenge to transform the idea of progress, which presumes a specific goal, into the idea of process, which does not. This transformation is, I now realize, a main event of the twentieth century, though it may have started earlier. A change which is happening in many areas of life, not only in design (Jones, 2021, pp. 158-159).

In his text Jones advocates for a critique of design methods and the need to develop a language for thinking, conceiving, articulating and exploring design that opens for flexible approaches and collaborative work in designing (Dilnot in Jones, 2021). In this line of thinking, design methods could be seen as evolving infrastructures, which undergo incremental metamorphoses, to be reconfigured according to the context and aim of design and not as a given algorithm that one should learn by heart and apply to the letter.

Following this reasoning, rather than providing a road map towards a certain design outcome, the development and application of design methods become scaffoldings that support exploring and allowing intuition, judgement, and uncertainty to emerge in given circumstances (Nelson, Stolterman, 2012). When defining a design strategy one can be inspired by previous applications of methods and change their structure according to the aim of the project. But to do so, one must understand what methods bring to designing – both on an instrumental level and on a conceptual level – and reconfigure the scaffolding accordingly. In assessing and assembling design methods appropriate for responding to a certain design situation, a critical attention needs to be geared towards the inherent values, logics, and limitations that certain tools, practices and perspectives carry due to the historical contexts of where, and why, they once entered design.

As Christopher Alexander once pointed out very clearly in his preface to the paperback edition of *Notes on the Synthesis of Form* (1964), focusing too strongly on a method in itself will risk losing track of the overall aims with the methodology, and process, it forms a part of:

Poincaré said: "Sociologists discuss sociological methods; physicists discuss physics." […] Study of method itself is always barren, and people who have treated this book as if it were a book about "design method" have almost always missed the point of the diagrams, and their great importance, because they have been obsessed with the details of the method I propose for getting at the diagrams.
No one will become a better designer by blindly following this method, or indeed by following any method blindly. (Alexander, 1971, Preface to the paperback edition, in *Notes on the Synthesis of Form*, 1964).

In light of such strong testimonies "against" detailed examinations of design methods, one could conclude that we should not dig very deeply into the detailed workings of specific methods. However, entering the analysis of these issues, perhaps it is not about the methods themselves, but about the way in which they are "blindly" used, to speak with Alexander, advocating instead for a more conscious and informed way of relating to design methods.

In this chapter we explore and begin to unpack one specific method that we have been experimenting and using within design education in S+S – Spatial Design + Service Design (De Rosa, *forthcoming*; De Rosa, 2019; Fassi *et al.*, 2018): the Desktop Walkthrough (DW). In design education, teaching the history of design methods by unfolding the pluralistic idea of design (Margolin, 2015) as an approach to design methods may allow students to develop a more actively critical attitude towards approaches, processes, methods, and tools. This approach is needed to overcome the blindness with respect to the historicity of design methods, unpacking design's conceptual foundations critically and creating a fertile ground for a deeper understanding of how designing can continue to evolve and respond to emerging contemporary and future situations (Redström, 2017).

The Desktop Walkthrough is a method that has become firmly established in service design practices, as well as in areas of participatory or co-design settings in commercial, civic, and social contexts. While the DW is widely adopted and described as a means for prototyping experiences, for generative collaborative work and for predicting and perfecting design outcomes, its origins are hardly ever foregrounded. In fact, when homing in on trying to trace the emergence of the Desktop (previously Service) Walkthrough, it is not easy to find

its entry points into the realm of designing. But despite this, an attentiveness to the embedded historicity of this method can nonetheless contribute to a critical unpacking of the DW regarding the different ways in which it can move into yet a new area of designing: as an experiential way of mapping interactions within a physical environment, to better understand and explore the relationships between space and service systems in contexts in which services intrinsically inform the spaces we live in and vice versa.

5.2 Revisiting the Desktop Walkthrough

Many design methods have been invented or borrowed from other disciplines, contributing to giving form to a beautiful pluralistic array of design languages and design practices. These influence the ways in which we act but also shape understandings of what design is, could be, and what it gives form to (Jones, 1970; Banathy, 2013). Design methods change over time, evolving and adapting to new contexts: sometimes through incremental refinement, sometimes through radical rethinking of how designing is understood.

The Desktop Walkthrough is no exception to this pattern. It has emerged in the field of Service Design, which began to take shape during the latter decades of the 20th century. The emergence of the term "service design" seems to take place in the early 1980s in a management and marketing context (Lynn Shostack, 1982). By the early 1990s calls were made to include this new area into the realm of design practice and research (Pacenti, Sangiorgi, 2010). The Desktop Walkthrough could thus be considered as part of a younger generation of methods with respect to those relative to more 'traditional fields' of practice such as product and communication design. Its boundaries of application are multiple, but some pillars of its scaffolding can be defined. We can start by positioning the DW within a broader design process to understand where it stands, where it can be positioned and with what aim, and after we will focus on the approaches that characterize this method.

According to previous research, the origins of the DW are to be found within the broader studies and evolutions of prototyping tools for designing services (Blomkvist, Bode, 2012).

Under its former name of 'service walkthrough', this method was described as a process for prototyping whole services rather than individual parts in isolation. This was perhaps an anticipation of the DW emerging from analysing, combining, and testing ways of doing and thinking of other existing prototyping methods and techniques such as bodystorming, roleplaying, experience prototyping and pluralistic walkthroughs (Blomkvist, Bode, 2012). If we take another step back to the early prototyping tools that emerged from studies around service design in the beginning of its formation, we can see that also scenario-building and storytelling (through various forms of visualization, narration and representation) were some of the first building blocks for testing a service through involving and observing the final user through a situated prototype put in the place where the service would actually exist (Diana *et al.*, 2009; Tassi, 2009; Blomkvist, 2011).

These first experiments in prototyping services were mainly 'place based', meaning that they involved real people in real spaces, taking part in the service representation in order to understand the physical and immaterial qualities of the service and the interlaced interactions, by physically 'walking through' the different sequences of touchpoints (Blomkvist, Bode, 2012).

It seems that the first academic characterisation of the 'desktop' walkthrough can be found in a paper for the ServDes 2016 conference, written by scholars Johan Blomkvist, Annita Fjuk, Vasilisa Sayapina (Blomkvist *et al.*, 2016). However, as they also underline, at the time the DW was already well known and established among practitioner's working with service design.

In *This is Service Design Thinking*, the Desktop Walkthrough was defined as: "a small-scale 3D model of a service environment [where] simple props like LEGO® figures let designers bring the situation to life, acting out common scenarios and helping develop prototypes" (Stickdorn *et al.*, 2011). The same publication underlines the use of the DW for iterative analysis providing a common language in which various people can assess and co-develop a prototype. In a revisited description of this tool by the same authors in the *#TISDD – This is Service Design Doing method library* on-line repository, the DW is identified as a "signature method of service design" for prototyping as it makes the "experiential process nature of a service – a story unfolding over time – tangible… [its role is to] help the design team to quickly

simulate a service experience using simple props like toy figurines on a small-scale stage (often built from LEGO® bricks or cardboard), and test and explore common scenarios and alternatives. The critical deliverable is not the model of the map/stage but the experience of playing through the service experience step by step".

These last definitions of the DW bring to life two other aspects of its scaffolding. The first has to do with expanding the idea of the DW from being a prototyping tool, used for evaluating and communicating, to a method in use also for exploring: an iterative thinking tool, between creating and prototyping (Stickdorn *et al.*, 2011). The second aspect introduces the idea of the DW as a participative tool, a way to help different stakeholders (also non-designers) rapidly and easily to codesign a service. In fact, to understand these aspects of the method and its applications in practice, we need to go deeper into looking at two of the main references to the Desktop Walkthrough as these emerge from scholarly research and practitioners' work: (1) LEGO® Serious Play (LSP) and (2) generative prototyping:

(1) LSP is a method developed in the mid-1990s emerging from cross-disciplinary research lead by researchers Johan Roos and Bart Victor with the aim to design more imaginative, effective, and responsible ways to guide leaders and organizations in their strategy making (Roos, Victor, 1999; Roos, Victor, 2002; 2018; Stalter *et al.*, 2009). The method is based on influences from different disciplines forming a set of strategies in which organizational narratives, heuristic reasoning and emotional content are combined with metaphors and storytelling as powerful sense-making tools. The use of LEGO® bricks only emerged in a second evolution of this research as a consequence of a commissioned work that put this knowledge into action. However, perhaps, as design practitioners, we tend to only see the LEGO® without grasping the depth of the research that led to this method.

(2) Generative prototyping is part of a broader set of tools under the umbrella of generative techniques within what has been defined as generative design research (Sanders, 1999; 2000; Stappers *et al.*, 2004; Sanders, Stappers, 2012). Generative design research is an

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approach that allows people (non-designers) to be actively involved in the design process. It comprises a set of methods and techniques that give people the language to express their ideas within a given design context or problem setting. In many of their experiences as practitioners, Sanders and Stappers have used a set of toolkits that go from more abstract triggers for ideation to 3D toolkits for generative prototyping. The toolkits are used to set up a playing field for participants of the generative session in which they can play and co-design.

As emerges from this brief excursus of contributions, the DW has evolved in time through multiple contributions coming from a constant dialogue and exchange between scholars and reflective practitioners (Schön, 1987).

The adoption of the DW in settings of Serious play and generative work in participatory design highlights how this method can be framed and performed in the contexts of quite diverse methodologies. While adopting the same method in both cases, the approaches that call for its inclusion are different – as are the methodologies framing it. In relation to methods and techniques, an approach can be defined as a way in which practitioners orient themselves towards all aspects of their work (Hofler, 1983). Within the many ways in which generative tools have been applied to aim for supporting a move towards design solutions, we will in the following focus more on those in which they have been used to map experiential contexts where physical spaces (spatial design) are designed together with services (service design). Here, two examples are given of how the DW has been applied in educational experimentations where spatial and service design solutions are integrated: first in a Product Services System Design Master course in Politecnico di Milano (2018-2021); second in a Product Design Course at the Universidade Federal do Rio de Janeiro (2017).

These two experiments, in an educational setting, inform and integrate existing knowledge about the DW: how it is used within design processes and how it builds a dialogue with other design methods within the design process. Doing so, this opens new opportunities to reflect on how, in which contexts, and with which objectives the method is called into action.

5.3 The Desktop Walkthrough: an application in S+S – Spatial Design + Service Design

As an experiential way of mapping, the Desktop Walkthrough allows for exploring and further developing research on the narrative dimension of the design process and its representation through examining the relationship between service design and spatial design (De Rosa, *forthcoming*; De Rosa, 2019; Fassi *et al.*, 2018). S+S is an emerging topic in design research, education, and practice. It explores converging factors and perspectives for the mutual influences between the theoretical background and the milieu (Margolin in Buchanan, Margolin, 1995, p. 122) of Spatial design with the tools and the language of Service design (Fassi *et al.*, 2018, p. 848). This area of exploration has evolved through multiple inputs, from a constant dialogue and exchange between design research practice and design practice.

This interchange has converged in the following assumptions: i) service innovations are reshaping spatial experiences and ii) spaces are a part of the service system to be designed (De Rosa, *forthcoming*; De Rosa, 2019). Given this, the Desktop Walkthrough stands out as a tool for exploring possible connections between the interactions and relationships occurring in a place with the environment itself, as it supports a two-fold analysis on how to experiment on tools for education and on the advancement on S+S.

Design developed a diverse range of methods and tools for managing the complexity of the systems considered and to be designed, and for triggering the creative thinking, in order to "guide their perception and understanding of design problems and solutions" (Dalsgaard, 2017, p. 21). In this sense, tools have a generative power, pivoting research insights into imagining preferred futures. It is about shifting from research analysis, made up of issues and constraints, to creative synthesis for project development (Penin, 2018, p. 239) (Fig. 1).
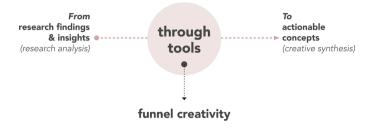
Fig. 1 – The iterative process from analytical thinking to creative thinking through design tools. © Annalinda De Rosa.

Building on Dalsgaard's (2017) five qualities of instruments of inquiry, the DW is here categorised in the *knowing-through-action* quality. It is a tool that enables and supports new knowledge generation through acting with the instrument (Dalsgaard, 2017, p. 28) and that allows expansion and transformation of design concepts through manipulation and development of them in more detail and complexity (Meroni *et al.*, 2018, p. 48).

5.3.1 The distinctive features of the Desktop Walkthrough in S+S – Spatial Design + Service Design

The DW is not only a category of *generative* toolkits, but it also acts in a *representational* way, contributing both to the search for new understandings and for refining existing knowledge, making generated ideas visible. Visualisation plays a crucial role as it makes ideas more tangible, complexity more readable, and alternatives shareable between different participants and recipients (Diana *et al.*, 2009). In this sense, the DW may act as a *boundary object*, as it *represents* the subject matter of design in the material form of design artefacts, whose function is to align designers and users in synchronous design processes (Star, 1988), facilitating the engagement and interaction with the design subject matter (Meroni *et al.*, 2018, p. 44).

Visualizations are also means for inquiry, for translating raw data into insights and work as ways to communicate insights: to highlight and question assumptions, to make tangible the service performance, to reframe and to understand, and to interpret data more than to describe data (Segelström, Holmlid, 2009).

Fig. 2 – Example of scene of a Desktop Walkthrough where actions and interactions between actors and touchpoints of the designed project are played by the designers. © Design Methods Course. Instructors: Valentina Auricchio and Davide Fassi. MSc in Product Service System Design, School of Design – Politecnico di Milano. Ph. Annalinda De Rosa, 2019.

The relationship between the representational and visual role of the DW has been explored in the "Design Methods" course at the MSc in Product Services System Design in Politecnico di Milano between 2018 and 2021. Here, students learn and test the opportunities of specific design tools and methods through the development of a conceptual design project in which service and spatial aspects are intertwined. Employing simple props, the DW lets designers bring a situation to life, acting out the scenario and developing the idea by moving the characters around the model, simulating the interactions they may have (Fig. 2). It allows iterative analysis of the situations depicted, envisioned through testing behavioural hypotheses of a specific timeframe of a chronological sequence of the idea / project in a specific physical environment. It can represent not only specific parts (moments or touchpoints) but also transitions in and coherence of the service proposition (Blomkvist, Bode, 2012). Fig. 3 shows examples of scenes of a Desktop Walkthrough – the 3D models on the left side –

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integrated with a Customer Journey Map. The students tested a unified visualisation in which two intertwined Customer Journey Maps were integrated, at a certain moment of the interaction process, through a DW in order to represent and introduce the spatial component of the designed project.

It becomes evident how the DW acts in three dimensions:
– in the **temporal dimension**, playing out the chronological sequences of actions (time-based nature of services);
– in the **relational dimension**, showing the actors involved, the mutual links among them (relational-based nature of services);
– and in the **spatial dimension**, introducing the materiality of services into the physical nature of space.

Fig. 3 – Example of scenes of a Desktop Walkthrough (3d models on the left side) integrated in the representation of two intertwined Customer Journey Maps. © Design Methods Course. Instructors: Valentina Auricchio and Davide Fassi. MSc in Product Service System Design, School of Design – Politecnico di Milano. Ph. Valentina Auricchio, 2019.

The intertwined relationship between these three dimensions makes the DW an experiential way of mapping since it performs actionable concepts: the DW owns a *performative* nature, thus it is one of the forms of representation that act through embodiment and live narrative such as performances, service enactment and bodystorming, i.e., where designer-actors embody people, as well as organizations and systems, (Penin, 2018). It is when the service is performed (through a face-to-face interaction, a digital one or through a combination of channels

between the user and the provider) that the scene of the performance comes alive.

In that, the service scene includes the design of the physical environment, of the tools used by the operators, of the products that the user uses directly to obtain the result and of the communicative and visual elements. The physical evidence constitutes the scenography and the props of the service interface. But the design of the interface also includes the plot of the interaction between the user and the delivery system, including the interaction with service operators, and the human elements of the interaction scene (Pacenti, 1998, p. 97). And this plot is potential, among infinite but defined alternatives (De Rosa, 2019, p. 34). The example in Fig. 3 represents how a DW can be focused on a specific timeframe of the designed project while also serving to test alternatives in the prototyping phase of any project idea, as shown in the diagram of Fig. 4. In this case, the DW supports building the narration of the final idea of a project: the selection of a specific part of a defined customer journey acts as a representation of the service display in the physical space, showing the impact of its tangible components in the transformation of the space and in the interaction between users and touchpoints. As an example, the DW developed by one of the student teams served first to highlight the hotspots of the project area – the external spaces in-between the buildings of the university campus – in relation to the analysis of their uses according to the behaviours and daily routine of the users – the students. The actual uses brought to light the lack of common and equipped areas for students' activities, identifying the need to revitalize and to turn them into places where students can study and meet other people. The concept ideas that followed, proposed innovative services which would support interactions and knowledge exchange among students and between students and faculty. Through the Desktop Walkthrough, the in-between spaces and the potential new services are drawn forth by playing out the possible user experiences, the needed touchpoints, the kind of users involved and the potential user journey. In this manner, the DW helps to both generate, make tangible, and test first project assumptions of the orchestrations of various aspects of the service in the physical space of the project.
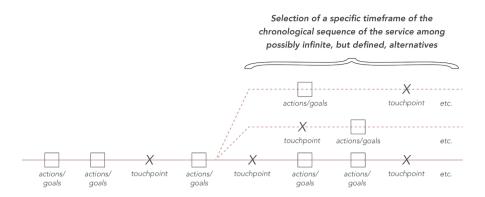
Selection of a specific timeframe of the
chronological sequence of the service among
possibly infinite, but defined, alternatives

actions/goals   touchpoint   etc.

touchpoint   actions/goals   etc.

actions/   actions/   touchpoint   actions/   touchpoint   actions/   actions/   touchpoint   etc.
goals   goals   goals   goals   goals

Fig. 4 – Simplified diagram of a Customer Journey Map, representing how
the selection of a timeframe to be then performed through the Desktop Walk-
through may serve to explore design alternatives during the project development
© Annalinda De Rosa.

Services exist only when the relationship between the user and the service takes place at a designed touchpoint. Otherwise, they fall back into non-existence. Service design usually adopts the concept of sequencing to break down actions and interactions in order to focus on the different components of the service. This is the service period, divided into pre-service, during-service, and post-service phases. Various methods and tools are used to explore and exploit the steps and the variables along the sequence, both as generative and representational tools that visualize the service as a sequence of interrelated actions to be performed both in the service's design and in the service exploitation.

Service design focuses its attention on the interaction moment between the user and the service, making the rest of the design consistent with that. The timespan of spatial design, on the other hand, searches for a longer relationship between the user and the space designed, building a world of references in the design as well as envisioning the intangible connection that – through time – human beings create with the space. How to make this temporal misalignment work when designing spatial and service design solutions? Here, the Desktop Walkthrough bridges these timescales in acting out the relationships between human actions and places through the

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sequencing breakdown of actions and interactions in a designed environment. The sequencing dimension of the performance, overlapping its time-component with the unfolding of the actions designed in the space, can inform the design of spaces by narrating all the sequences of the interactions and of the activities in a complex view. The DW could thus be used in the *front-end of the design process* to explore this complexity while designing spaces components and features with their services, also engaging novice designers as well as learners or experts with different backgrounds.

This aspect was explored in a workshop run in 2017 within the Product Design Course (Workshop Instructor: Annalinda De Rosa; Course leader: Carla Cipolla) at the Universidade Federal do Rio de Janeiro, Brazil in 2017. The brief of the course required students to envision innovative solutions for urban public spaces able to foster social cohesion and inclusivity in Rio de Janeiro. The topic focused on how people's actions can be the driver of change concerning the transformation of urban public spaces through new forms of mobility, new forms of interactions, unexpected forms of interactions, unexpected workplaces, and unexpected meeting areas. Through placing attention on the analysis of complex locational factors, this experiential learning method served to enrich S+S design skills of students.

Focusing on the methodological process (Fig. 5), students were guided through the following phases:

– "Learn from the context", on-site field research, based on observation, interviews and mapping activities. These three directions served to build a complete analysis of the selected area in terms of understanding the physical evidence and the relevant social issues of the context.
– "Ideate – Brainstorm & development", a defining and developing phase for identifying an opportunity for design (the design challenge) through systematisation of the collected data (key learnings). This phase aimed at getting students to interpret a multifaceted environment through personal explorations, direct contacts with citizens, and a critical understanding of the physical components. At this step, students clearly defined the spatial highlights and insights, and the possible chronological sequence of actions to take place in their project.

– "Scenario – A journey in the solution": the goal was to tell an innovative spatial story, showing the actions taken, the actors involved, the time of the action and the spatial values. After the definition of the contextual constraints and the design opportunities until the design concept, the final phase was dedicated to understanding where the developed idea takes place and how in relation to the physical area selected. Here, the DW was employed and integrated with other design tools.
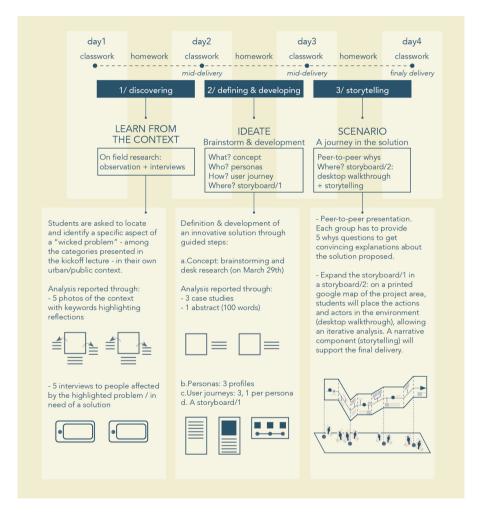

Fig. 5 – Explanation of the design studio process: calendar, phases and focus on tools and methods. © Annalinda De Rosa.

To do so, the tool tested was the *Spatial Storyboard Plus*, a mix of existing tools – Desktop Walkthrough, Scenario description swimlanes and Storyboard. These were chosen in order to find ways to express the complexity of multiple factors, its variables and its unfolding in space and time. This convergence of tools was created also to meet the entrepreneurial background of the students involved. In short words, this sum of instruments served to include the following components:

– The enactment of the performance, envisioning the intangible connection in time and space, through the *Desktop Walkthrough*.

– The visualisation of the activities of multiple actors in a flow of events with a holistic perspective, through the *Scenario description swimlanes* (Fig. 6). This tool can benefit any project where several processes or actors have to come together to shape the outcome of the same flow of events. Its direct, visual nature provides a bird's-eye view of all the moving parts within a story (Hanington, Martin, 2012).

– The representation of the narrative dimension to show the manifestation of every touchpoint and the relationships between them and the user in the creation of the experience, through the *Storyboard*.
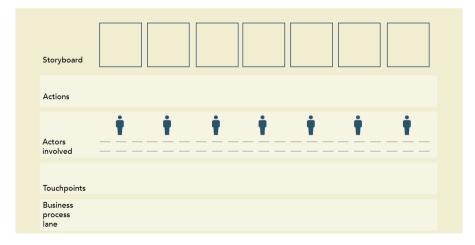

Fig. 6 – The Scenario description swimlanes form provided to the students. © Annalinda De Rosa.

Matching these tools in the *Spatial Storyboard Plus* provided a way to transform the students' final presentation into an acting performance, overlapping its time-component with the unfolding of the actions designed in the space designed. While Figure 7 shows the logic required to match the information of the designed project between a schematic representation and the DW, Figure 8 illustrates the visual strategy to represent the plot of the interaction between the user, the service system, and operators and all the human elements of the interaction scene within the spatial and temporal dimension to get a unified visualisation. This served to express the complexity of multiple factors, its variables and its unfolding in space and time.
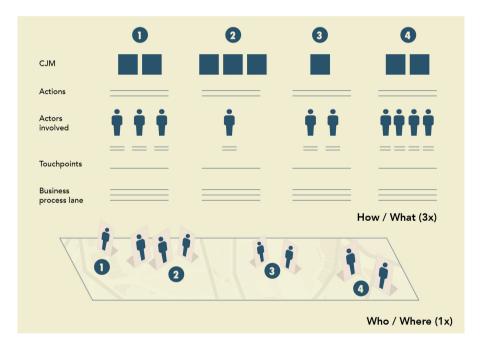

Fig. 7 – The Scenario description swimlanes visually matched with the Desktop walkthrough components. © Annalinda De Rosa.
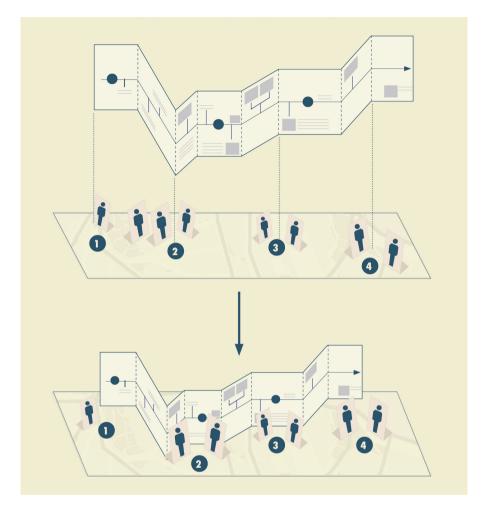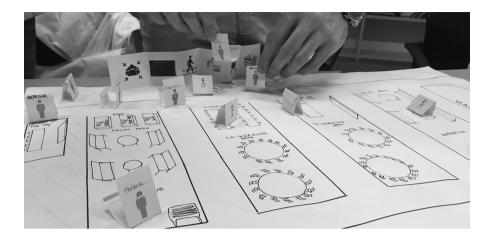
Fig. 8 – The Storyboard integrated and "inhabited" within the Desktop walk-through. © Annalinda De Rosa.

Finally, Figures 9 and 10 show the result of this experimental version of the DW. Simplified representations of the plot were developed using icons or through the integration of real context pictures with imagined actions to take place in the physical environment. The experimentation provided the environment to test for a deeper hybridization of tools and approaches from Service and Spatial Design.
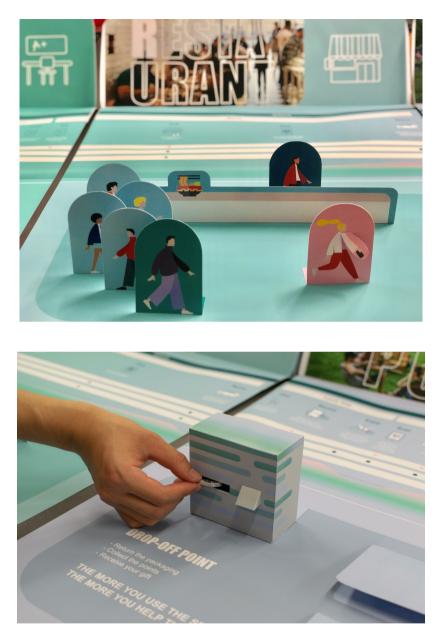
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Figs. 9-10 – Final presentation of the students' projects, April 13th, 2017 at Universidade Federal do Rio de Janeiro. Ph: Annalinda De Rosa, 2017.

The expected results were to explore the way in which students approach the problem-seeking rather than the problem-solving process. Since dealing with management engineering students, it was not so evident for them how to handle the unpredictable side of the creative process, nor how to work with iteration, in a such a short amount of time. For this reason, the process was strongly guided by specific tools and methods, all of which were new ways for

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these students to approach a project. The elaboration of the "Spatial Storyboard Plus" tool served to explore the deconstruction of a sequence of actions (time-component) in a space, supporting the identification of possible functions of the service and, consequently, of related tangible solutions to be displayed and distributed in the project area. The DW helped to express the complexity of multiple factors, its variables and its unfolding in space and time in a unique representation able to illustrate the possible impact of a service concept on the design of spaces.

5.4 Conclusion

The Desktop Walkthrough is undoubtedly a simple tool for capturing some intangible, temporal, and dynamic aspects of a service, making it easy to use also by design novices or in facilitation sessions (Blomkvist, Wahlman, 2018). Beyond this and for the purpose of this chapter, the DW aims at exploring the experiential ways of mapping for designers, as part of the process of design development.

A method such as the Desktop Walkthrough was once brought into design situations to support a quite specific design action: rehearsing a proposed service flow in order to test or refine it – by designers, or by users under the lead of designers. The DW has been introduced in participatory and co-design contexts as a method supporting processes where designers and non-designers collaboratively generate ideas and insights that can take a design idea in diverse directions. It thus supports relational, temporal, and spatial negotiations in the design situation, between the participating people, the materials made to support envisioning and enacting, and the shared physical space – classroom, office, or other – where all this takes place. However, as shown above, this method can be applied in ways that evoke not only temporal but also spatial qualities and aspects in designing services. But the spatiality is not only the imagined future settings of the service touchpoints, or the foreseen movements in spaces and places where a service would play out.

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Figs. 11-12 – Enactment of a Desktop Walkthrough in the final presentation of the course. © Design Methods Course. Instructors: Valentina Auricchio and Davide Fassi. MSc in Product Service System Design, School of Design – Politecnico di Milano. Ph. Tommaso Bernardi, Zhengang Lou, Federica Piazzi, Qiuyue Wang, Chenfan Zhang, 2019.

In activating different aspects of collaborative designing – the imaginative, the relational, the result-oriented – through the DW, the method itself also shapes ideas and practices of what designing is and, what it is that should be designed. This means that embedded in the method, is a negotiation not only what is made, or how a future service experience might be approached from "users" or "providers", but of who is engaged – and how – in making decisions and influencing how designing is done. As the DW continues to be applied in a variety of design situations, it enters methodological contexts that begin to differ from the historical settings in which it once emerged. From focusing on including users in testing and refining services from a business perspective, by way of co-designing, the method is here proposed as supporting also the bridging – and merging – of temporalities, scopes and considerations in an intertwined designing of spaces and services.

The introduction of the DW in the Italian project culture calls for a reflection on how this method integrates, or builds a dialogue, with previously established practices – and also on the embedded values it brings into these situations. The examples of application presented in this chapter have not only positioned the method within the S+S context but have also shown how it can be integrated in education as an experiential learning method, serving to enrich S+S design skills. Future adaptation and evolutions of the use of the DW, as with any other design method, will most certainly be expected in order to respond to emerging design challenges.

This continuous process of integration of methods in new areas of designing and their hybridization with other methods (as shown in the examples above), asks for flexibility in exploring where, how and why these possible evolutions take place. Doing so, requires that such implementation of methods also is paired with a reflective probing and documenting of their introduction in different contexts. An attention to the scope and aims of historical, contemporary and emerging methodologies in which methods have been, and can become, applied and introduced can help us avoid rigidity and automated blind use of methods while also encouraging a constant dialogue between design scholars and design practitioners. In this way, in the future, rather than seeing methods as elements of a given toolbox, we might consider them as an integral part of the debate on what design was, what design is, and what design could become.

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group of UID between 2008 and 2018, holding the position as Head of Institute between 2012 and 2015, and Vice Rector 2015-2018. In 2021, she was Visiting Senior Researcher at the Department of Design at the Politecnico di Milano.

Silvia Maria Gramegna. Designer and PhD, member of Lab.I.R.Int. – Laboratory of Innovation and Research on Interiors – Silvia Maria Gramegna is a PostDoc Researcher and an Adjunct Professor at the Design School and Department of Politecnico di Milano. Her research work addresses issues that explore the strong anthropological value of Design. In particular, her covered research topics encompass the development of therapeutic environments for elderly with dementia, within the context of GRACE_Lab, an experimental interdisciplinary laboratory aimed at developing spatial solutions and devices to enhance the effectiveness of Non-Pharmacological Therapies for Alzheimer's Disease. Furthermore, her research explores the enhancement of sensoriality and perceived quality of places (interiors and urban areas), through an inclusive approach, which focuses on the evolution of the concept of Inclusive Design, into Design for Diversities – experienced in the field of ageing society.

Emilio Lonardo. PhD student, designer who works in various fields, from interior design to strategic design, including graphic and product design. Since 2013, he has been collaborating with Politecnico di Milano and Poli.Design as a tutor in design workshops and theoretical courses and as a teacher and tutor in the Master in Urban Interior Design [MUID]. He published several national and international works on design and poetry.

James Postell. Architect and Associate Professor, Product Design, School of Design, Politecnico di Milan. Professor Emeritus, College of DAAP at the University of Cincinnati. He has taught architecture, interior design and product design at, Texas Tech, University of Cincinnati, DIS in Copenhagen, and the Politecnico di Milano. He focuses his research activity on links between design, technology, and methods of production, with focus on furniture design. Previous owner of www.designstudio161.com. He has designed and written about interiors, furniture, craft, and materiality.

Massimo Schinco. Psychologist Psychotherapist. Adjunct Professor in the Department of Design, Politecnico di Milano, Italy. Member of the European Family Therapy Association, he teaches Systemic Relational Psychotherapy at the Centro Studi Eteropoiesi in Torino, Italy, and is a Teacher at the Milton Erickson Institute of the Bay Area, USA. Author of numerous essays in his fields of interest, such as psychotherapy, creativity and psychological implications in the reuse of places.

Francesco Scullica. Architect and PhD in Interior Architecture, he is full professor in industrial design at Design Department at Politecnico di Milano. Since many years he carries out researches, didactic activities and consultancy for professionals in the field of interior design, with a special focus to hospitality design, office design and design for Hybrid Spaces, and on this topics he's the author of relevant publications. Many times he's been participated to national and international conferences and meetings on design. He's been one the 100's Italian Design Ambassador for the Italian Design Day from the 2018 edition until now.

Gisella Veronese. PhD in Interior Design at Politecnico di Milano, BSc Hons in Industrial Design Engineering at Brunel University West London; adjunct professor at Politecnico di Milano, University College London, IED Milano, Scuola Politecnica di Design Milano; visiting professor at Tongji University Shanghai; tutor in many International design workshops linked to the Erasmus exchange and IDEM network; she worked in art galleries and PR agencies, organizing cultural events; she collaborates with architectural studios in the field of interior design, both commercial and residential.

The book presents different perspectives of analysis and new models of experience, reconfirming the importance assigned to the wellbeing and human-centered approach in the contemporary spatial design disciplinary debate. The focus on "engaging spaces" is due to the increase of participatory experiences in the design strategies supporting designers who want create tailor made environment to feel people more conscious of the great value of social relations.

The title of the book anticipates the aim to explore the transformation process which we are living, both in private and in public spaces, underlining the central role of design to define new qualities of connections to live together in relation with the space around us. The volume is divided into two parts described below.

The first, "Social design for engaging spaces", explores private and public space case studies introducing new hybrid dimensions through the social engagement in "living communities" and reports participatory design approaches in the transformation processes of shared common spaces, such as schools, intended as incubators of social practices.

The second, "Experience design for engaging spaces", describes more in-depth the experience of human beings in relation to physical and emotional aspects of space, focusing on the quality of the built environment that deeply affects people's wellbeing, social interaction, and cohesion, and investigating ephemeral practices and projects to experience design through a conscious sensorial approach.

The pandemic and the return to a "post-pandemic new normal" have led us to further reflect on the spatial processes of transformation and hybridization and their shared use in both the private and public spheres, exploring the importance of participatory and engaging strategies in the different phases of the design process with the aim to increase social awareness. Being back to the physical perception of spaces has confirmed the importance of evaluating the project's sensorial aspects with a new awareness. This novel attitude leads to rediscovering the values of measurable space in the constant confrontation with the virtual perspective that triumphed during the pandemic, introducing the "time" factor in the design discipline even with a broader complexity than before.