TIME-BASED
DESIGN PARADIGMS

edited by Anna Barbara, Silvia Maria Gramegna

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D.I. **FRANCOANGELI** DESIGN INTERNATIONAL OPEN ACCESS

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Introduction

by Anna Barbara, Silvia Maria Gramegna

The digital revolution that has taken place in the last 20 years is a revolution of time, which for the first time not only compresses and dilates space (as happened in previous revolutions related to mobility), but also bends it, allowing people to multi-presence, simultaneity, ubiquity. Above all, this multi-temporal dimension allows physical and digital spaces to be reformulated and made to interfere with each other.

The disciplines of design have been overwhelmed because this means admitting that most of the buildings we live in, are inadequate because they are oversized or underestimated. It is therefore an epochal moment in which to analyze and experiment with the potential that time allows for spaces, both in their forms and in their dimensions, qualities, performances.

The 21st century is the era of temporal revolution in design, architecture, transportation, but also in the memory of places.

The relationships between spaces and bodies also change, and the sense of 'place' itself is modified. Time has an impact on the ways of crossing, on the ways of being, on speeds, on distances and proximities. It changes the relationship between the memory we have with places, as well as the perspective of duration of the artifacts that decorate our spaces.

The ongoing digital revolution and the recent pandemic have shown that the temporal dimension of spaces is a horizon that has yet to be strongly explored. In the future it is increasingly likely that it will be the forms of time, rather than those of space, that will undergo the most interesting innovations and transformations.

Within this theoretical framework, the book explores the strong and mutual relationship intercurrent between time and the design of spaces. In particular, the authors investigate which forms of time will increasingly impact spaces: those of memory, of the everyday, of the extraordinary, of the future, of terrestrial and astronomical spaces, etc.

Moreover, the various chapters explore the concept of time through different perspectives and meanings: as measurements, adaptations/compositions, memories, machines and technologies, identities, narratives, sensitivities in an increasingly globalized and wrapped world.

The book begins with an overview by Postell, Borella, Mangiarotti, Scullica and Veronese on domestic spaces and its etymology, combined with an introduction of furnished spaces (focusing on European scenarios from Modernism to the post-pandemic present) and their human dimension. In fact, the first chapter explores the systemic relationships existing between furniture and domestic spaces, understanding furnished domestic space as identifiers of time and place. Societal values, human dimensions and design pillars are intertwined, and clearly identify how components like different uses, ways of living, proxemics, behaviors, multifunctionality and ethics are capable of shaping spaces, along with time.

In a similar direction, the experience gained during the recent pandemic, has brought new needs and new stimuli to re-question the ways of living in the domestic space. In particular, the compulsory stay-at-home condition that people experienced all over the world, led to a super-use of interiors, considering home as a place where 'to stay' instead of 'stationing'. Accordingly, Camocini and Gramegna, in the second chapter, try to interpret these fragmented, spontaneous, and temporary spatial interventions as elements of a broader process of rethinking the domestic environment towards the fulfillment of well-

being and performing demands, according to a new interpretation of time, as dense, virtual, and prolonged.

Furthermore, Barbara explores the role of senses and time, as key ingredients in the architectural design of places. In fact, spaces are not inanimate volumes fixed in time. When we live in a space, we stay with all the senses and we experience many times, not just the present. As designers, Barbara suggests that we have to learn how to analyze, to map and to design with time, reshaping the forms and writing systems of notation to describe the experiences, the rhythms, the duration of human experiences in the spaces. Accordingly, the author suggests designing new measurements tools, called chronotopes, to help designers to represent and express the qualities of time and spaces.

The concept of time and spaces could be addressed from different points of view. Accordingly, Yelavich explores the perspective of design studies and narratives. In her chapter, she proposes a reflection through the introduction of different narratives which offer a way of thinking about design that doesn't segregate the instrumental and the theoretical. Instead, such works synthesize the quotidian and the poetic yielding a wider tributary in the thought of things and places. Design's multifarious entanglements are examined within different temporalities and within three broad understandings of time: as deep, as immediate, as yet-to-be.

Moreover, Varanasi, in her chapter, explores deeply the concept of time, and how it shapes and characterizes the spaces we live, according to different behavioral patterns. In fact, time encounters different expressions to denote it, or to describe its passing. According to Varanasi, time has a cyclic nature, and it is strictly connected to habitat, food, and clothing which represent us as human beings, who react and create these fundamental constructs and narratives, which then define the 'culture', 'religion' and day to day lives.

Human beings design their lives in many ways, their daily routines are guided by 'time'; and their longer terms goals have a time frame. Varanasi suggests that architects and designers are constantly anticipating how others behave, how others will react and behave in

the spaces they design; how other factors like the culture, festivities, climate, and context determine the outcomes. In her chapter, the author explores this continuous and beautiful interconnectivity, between time, culture and spaces.

In the sixth chapter Annalisa Dominoni explores the field of space architecture, in particular the physical environment of the ISS. The author proposes a perceptive and cultural 'shift' that presents the ISS as a time machine, in which the perception of space and time is altered by different conditions, including confinement and microgravity. In fact, time is a fundamental dimension of everyday life, that we cannot see, but that we can unequivocally perceive, and adapt our behaviour accordingly. In the particular context of the ISS, the role of design is to 'mitigate' the effects of the extraordinary environment lived in Space trying to enhance a condition of balance and increased well-being.

Lastly, Di Sabatino and Mastrantoni explore issues surrounding 'time' and 'time-based' design, analyzing how the concept of time and place, meant as presence, coexist and influence each other. This chapter proposes an excursus through various critical theories of place- and time-based design through the writings from selected seminal texts. These themes range from larger scale, broad-based issues, such as the relationships amongst the past, present and future to more specific, smaller scale aspects with the inclusions of topics pertaining to presence, memory, meaning, experience, storytelling, narration, movement, and ritual. Moreover, they are visually articulated through focused design work exploring the various themes and a specific location. Murano serves as a sort of ideal case study location for this exploration, which includes its physical properties, inhabitants, visitors, and its various tangible, quantitative aspects. This case shows how time can be made more plastic and elastic with a progressive approach to the possible continuum of past, present and future time.

1. Furniture and domestic space as identifiers of time and place

by James Postell, Mauro Afro Borella, Raffaella Mangiarotti, Francesco Antonio Scullica, Gisella Veronese
Department of Design, Politecnico di Milano

Abstract

We gain insight into the human dimension and into societal values when we study the design, construction, and use of furnished domestic space. This chapter begins with an overview and etymology of *space* and *furniture* and our definition of *the human dimension,* followed by an introduction of iconic, furnished domestic spaces. Systemic relationships between furniture and domestic space are explored, concentrating on the human dimension, societal values, and design pillars linked to the theme of time and place. The authors look at furnished domestic spaces across time and place, focusing on European scenarios from Modernism to the post-pandemic present. The following components are explored and serve as a framework to build an understanding of furnished domestic space as identifiers of time and place:
- Time and place concepts: historical, cultural, and spatial context.
- The human dimension: use, users, proxemics, human behavior, gendered space, privacy, and collective space.
- Design pillars: (i.e., multifunctionality, nature, and ethics).

The chapter concludes with a didactic learning experience in which students explored furnished spatial solutions for co-living and co-working in the post pandemic present, incorporating concepts of multifunctionality, sustainability, and ethics in their work.

1.1 Introduction

Furnished domestic spaces have shaped the *modern* genesis of design and influenced design movements, especially those that utilized advancements in the industrialization of products and furniture between the 19th and 20th centuries (i.e., Arts and Crafts, Art Nouveau, Modernism, etc.). As an example, consider the private residence and studio of architect Victor Horta in Brussels, Belgium (1898-1901) which was conceived as a total work of art. The combination of industrial and luxurious materials in the design, in concert with Horta's custom furnishings, embody societal values of its time (rise of Modernism) and the *zeitgeist* of Art Nouveau in Belgium. Furniture, which has become iconic in recent times was, in many cases, first created from the professional practices of interior architecture and interior design. There are many examples of iconic furnishings designed for a specific space, tethered to the context of time and place, that were later manufactured and marketed as contract furniture for use in completely new and often distinct settings. Consider the intertwined relationships between space and furniture carried out between the culture of proto-rationalism, rationalism, and in general, the modern movement. Twinning furniture to space as a cultural reaction to a specific timeframe can be referenced in many ways. As examples we can cite: Alvar Aalto with his Sanatorium at Paimio, Finland (1933); Pierre Chareau, with his Maison de Verre in Paris, France (1932); Arne Jacobsen with his SAS Hotel in Copenhagen, Denmark (1960); Gio Ponti, with his Hotel Parco dei Principi in Sorrento (1960); Franco Albini with his Villa Pestarini in Milano (1938); and Gae Aulenti with her private home in Milano (1993).

Related to these examples, selective furniture companies like Knoll International (1940s), Cassina (1970s), and more recently, Fritz Hansen (1980s) and Vitra (2000s) all have manufactured furniture independent from their corresponding and original context of time and place and marketed them as *contract furnishings* for use in a broad range of settings. These furniture companies generally reference the original context of each piece, but in marketing and selling to the consumer, the furniture is removed from its original context, blurring

the association and linkage with time and place. These furniture companies have updated and adapted the manufacturing processes of the original pieces, to the technologies and processes of the mature industrial structure. Whether conceived as a complete work of art, as cognized by the German term *Gesamtkunstwerk*, first used by K.F.E. Trahndorff, a German writer and philosopher or, as a hybrid or fragmented interior environment that includes personal and eclectic family treasures, domestic spaces and their furnishings have a history of maintaining significant, dependent, and meaningful relationships to time and place.

In this case, we can consider how the re-design of furniture and objects, and their use as design icons, correspond to their placement outside of their original context, not only regarding the spaces for which they were originally designed, but also regarding the *time, or era* in which they were conceived. This points to relationships lost and gained in the concept of design that crosses into the territories of art and artistic research, according to the interpretation given, for example by Gillo Dorfles (Dorfles, 1972).

While design icons and custom-made furnishings can meet the needs of the luxury sector, today, many consumers need furnishings and products to complete relatively small domestic spaces and supply multi-functionality with increasingly reduced budgets. Our time, especially in Europe, is branded by concepts of sustainability, multifunctionality, and ethics, with a call for social democracy. The social classes that patronize the luxury market are becoming more despondent to most of the world's population, which often share small spaces and find themselves sharing activities and services beyond the necessary safety measures imposed by the pandemic.

While the luxury market can provide an alluring solution towards living well, it is simply out of reach for millions of consumers today. Therefore, we are seeing a resurgence towards products and spaces embracing social democracy within many contemporary interior design solutions.

Since the end of the 20th century, several international brands (i.e., Artek, Habitat, IKEA, Zara, H&M, and Design Within Reach) have responded to the growing demand for affordable design and by creating a one-stop-shop consumer experience. Their attention to

manufacturing and marketing reasonably priced products expresses a clear and directed shift towards social democratic values.

In this case, we can see how some ethic-social *values*, typical of the modern movement and of its first promoters, especially in the Europe of the '20s and in part, of the '30s with reference, in particular, to the French, German and, later, Danish scenarios, are again revised, and therefore, how historical periods and actual historical times connect, through new needs, and those already encountered in a previous historical context.

This can lead us to ask ourselves how *temporal cyclicity* can exist in design, and how phenomena once thought to be outdated (such as those of *democratic design for everybody*) suddenly become relevant again in the context of a globalized world.

IKEA is known for their furnished room displays within their retail outlets (see Fig. 1), marketing the furniture and products within a furnished interior space. IKEA, responding to an evolving mobile and global lifestyle, manages design innovation and manufactures not only affordable furniture and accessories but also markets their furniture and products as *socially democratic design* in concert with a multiplicity of home good products. According to Sarah Fager, Senior Designer, IKEA of Sweden AB, *Socially democratic design* emphasizes low-cost, functional furniture with aesthetic choices. This movement also seeks access to lower cost products inspired by recognizable furniture designers, as Design Within Reach and IKEA have successfully offered consumers.

The five dimensions we call Democratic Design are at the heart of every product we make. It's basically our culture and values boiled down to five dimensions, together with simply using common sense in everything we do (IKEA website, 2021).

Fig. 1 - IKEA furnished room within the retail experience. Photo, J. Postell

The success of IKEA seems to be deeply linked to scenarios of *democratic living*, a movement in Europe which occurred at the dawn of Modernism. Today, IKEA provides a broad range of global users with the possibility of accessing different types of low-cost solutions which is a *pragmatism* distinct from the *pioneering* and *experimental* approach that had characterized European furniture design in the '20s and '30s, and specifically, Italian design in the '50s and '60s.

The trend of low-cost design, especially in the wake of the COVID-19 pandemic, seems to also underscore a growing dichotomy between:

- Shared communal space and need to maintain social distancing;
- Coexistence of communal and private space;
- A growing use of actual space for virtual use (and vice versa).

Up until 2020, furniture designed with socially democratic values have been more experimental, even intellectual exercises. The pandemic has jolted many designers to reconsider a different set of values for future design solutions to address these dichotomies.

The term *social distancing* is increasingly making evident, a need to reconsider appropriate practices of spatial relationships and behavior between users who find themselves sharing space-service systems. As the COVID-19 pandemic has revealed, people need design solutions for living well in a newly redefined world. Just as

Europeans did in the post-World War II era, we are beginning to explore contemporary solutions such as those which were emblematically represented in Italy by the Triennale di Milano exhibit *La Casa per Tutti* (2008), which reimagined domestic relationships of furniture and architecture in time and place.

1.2 Living scenarios and the contemporary polis

I am convinced that architecture is tied to the polis, it is an art of the city, of the foundation, and as such it is necessarily related and conditioned by the context in which it is born. Place, time, and culture create that architecture, instead of another (Aulenti, 2002).

In this statement, Gae Aulenti refers to the city as the foundation for architecture conditioned by the context of time, place, and culture. Architecture, and interior space, therefore, becomes the foundation and context for furnishings created for the functionality of the architecture. We typically consider the *polis* of a city as a place for people moving from point to point, co-mingling with others, entering and exiting from space to space, building to building. The polis of the COVID-19 era has been mandated to function differently than before, being more confined to domestic spaces than in the past. This creates a design challenge and need for new solutions for the post-pandemic present.

Today, more than in the past, people are adapting between fluidly changing spaces, both contracting and expanding. Existing public spaces have been put to the test for social distancing, meaning that standard occupancy measures have been recalculated for public spaces. More space per person and less furniture in space to reduce contagion. Architects and designers up until now have used standards that reduce space people can comfortably use, without full consideration to the fluid state of space under crisis. This new living environment demands exploration of alternative thinking about solutions for healthier and smarter living. It requires designs that incorporate societal values and design pillars suitable for these challenges the contemporary polis is experiencing. We begin the conversation by introducing living models that have been around for

several generations that may become more permanent solutions that adapt well to our framework. The introduction of these models can be fundamental to understanding better the role and meaning of new furniture and its relationships with space and time.

1.2.1 Collective housing: co-living and co-housing

We see evidence that the concept of collective housing is not necessarily new, and this helps us to reflect on the nature of *cyclicality* in design. Collective housing responded to an influx of workers who needed temporary housing in cities during the transitional era of the Industrial Revolution. It provided for civil coexistence among people who lived in multi-generational families or among strangers, better understood as tenant housing. This model has a corporal owner of the building, and the apartments are rented, not owned by the tenants. It remains a common model for much of the world's urban domestic landscapes because it is often the cheapest option of housing.

There is also the model of collective housing where tenants are the owners of their apartment and share the communal costs of building upkeep and make budgetary decisions for the collective good. This form of housing is a common model for much of the urban domestic landscape for people who can afford to own in areas where private land and detached homes are scarce. We identify two strong proposals of collective housing today, *co-living*, and *co-housing.*

Co-housing is a housing typology that provides choice, control, and management of lifestyle. It is a community-led residential settlement that includes privately owned houses with shared communal spaces, designed for interaction and building community. It is important to underline that co-housers do not only share spaces, but they also share decisions as well, since a co-housing is a self-managed community. It may be intergenerational or focus on a targeted group (i.e., single parents, people with disabilities, or the elderly). Schemes therefore vary from one co-housing model to another, but they are all designed so that the concepts of privacy and community are balanced.

Co-living is a typology of residential settlements that includes fully furnished, private accommodations and communal spaces, designed for social interaction and collective sharing. It is a form of shared

living among strangers, offering a platform and a network for enhancing the sense of community. It is often a comfortable and affordable solution for temporary housing needs very popular with younger people today.

In co-housing and co-living, *time* plays a fundamental role. Co-housing is generally for more extended use with stays similar to those of a traditional residential building-structure. On the other hand, co-living is generally for shorter stays, similar to a neo-hotel modality.

The distinctions in the time and duration of stay deeply influence the relationship of the users with the spaces. This distinction is further reinforced in the furniture with its different roles and different ways of use. In co-housing, furniture is typically owned by the users, and in co-living, furniture is often considered as *integrated equipment*, part of the project of the housing structure. We will revisit these housing models in a later section, but now, we turn attention to an alternative typology of furnished domestic space, *the tiny house*.

1.2.2 Tiny house: an alternative typology

Traditional space divisions based on temporal norms of *day and night activities* are blurring. They range from the most common living spaces such as flats and condominiums in which people share with other people because they cannot pay the rent on their own and help each other with the cost of living, to micro-living, as well as tiny spaces on wheels and otherwise movable (Garcia-Guzman, 2019).

Tiny houses are defined as small dwellings, generally single spatial structures, different from a mobile home or camper. They provide a small living space in which an individual has privacy. If it is necessary to move often, then the one on wheels is perfectly suitable (Garcia-Guzman, 2019). The concept of a tiny house is based on minimalism and optimization of interior spaces, providing for the reduction of size but simultaneously maximizing quality. This approach allows the maximum potential of the house to be exploited. For there to be efficiency and functionality, it is important that home automation is present. Smart, tiny houses offer energy savings, comfort, security, and sustainability (Giuditta, 2019).

1.3 Furnished domestic space

Furniture complements and completes domestic space remaining supportive to the behavior and activities of its users. This underscores a central 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).

The history of furniture and interior design both stem from emerging and established societies, driven by designers, architects, industry, and consumers, fueled by societal values and evolving technologies. Therefore, the history of furnished domestic space is really a chronology of how societies have thought about living and dwelling. We focus on and define *the human dimension* as aspects that embody use and user experience (UX), gender issues, ergonomics, proxemics, and societal values. If we seek to better understand the values and aspirations embedded in domestic space today, we might first consider its evolving chronology and the human dimension that has shaped the domestic landscape through time and place.

When we introduce concepts of themed interrelationships between furniture and space (i.e., complementary, private, unified, and hybrid), as well as terms that connote specific activities relative to specific domestic zones (i.e., cooking, eating, sleeping), we recognize that the activities of the users, and specifically how the activities are done, (i.e., with whom, how often, when) are important to consider together and in context.

Central to the professional practices of architecture and interior design are changing values, concepts, and ideas embedded in the term *context*. Designers develop *contextual* solutions in their projects that intentionally reinforce the idea of *place* (site, environmental considerations, psychological, sociological and user considerations), within the constraints of available resources and time. Furniture significantly contributes to the use and meaning of domestic spaces, but also to the larger implications of architecture and urban life. Not only do furnished domestic spaces serve as identifiers of time and

place, but they are also directly linked with evolving technologies and societal ideas tethered to *proxemics* (i.e., the study of how people use, behave, and communicate in and through space).

In the post-pandemic present, private and communal spaces are no longer binary, nor are the paradigms of gender- or age-dependent space as clearly defined as they appear to have been in the past. Today, domestic space is more fluid and inclusive of complex human interactivity, often with multi-functional use challenging traditional conceptions of *place*. Today, spatial-use boundaries in the *home* have become blurred. Due to several factors, this has opened new perspectives about spatial and social-use interrelationships.

Moreover, we can add that, in relation to time, since the 1990s, the concept of *experiential fruition* of the space-furniture-services system has been gaining value, not only in the home, but also in other typologies (i.e., hotels, offices, restaurants, culture, entertainment, etc.) (Pine, Gilmore, 2000). Before exploring relationships between furniture and domestic space further, let's consider the terms: *space* and *furniture* and seek to understand their shared and distinct meanings.

1.3.1 *Space* and *furniture*

Dictionary and encyclopedic sources identify words like *accessories*, *equipment*, and *movable objects* to define furniture.

Words certainly can describe the physical characteristics and social use of furniture, but those who design interior spaces and furniture professionally know that furniture extends far beyond dictionary or encyclopedic definition (Postell, 2012). Furniture is something people *experience* in a spatial and social setting. Furniture complements interior space, and in this context, the word *furnishing* is used appropriately. In addition, it is useful to distinguish the terms that describe movable objects (i.e., *mobile*, moveable products) from those objects and built-ins that complement interior space (i.e., furnishings and *equipment*). When we consider specific activities of furniture relative to social-use categories, we begin to shift our thinking from objects to the user's actions (transitioning our thinking from *things* to *experiences*). When we think about the word *chair*, we begin to

consider the many conceptions and social uses embedded in the word *chair* (i.e., dining, reading, lounging) and we begin to consider the chair's function (i.e., highchair, task chair, rocking chair), the users and spatial context of the chair. The word *chair* nearly always is embedded with activity; therefore, this single term holds multiple meanings, functionalities, and spatiality. The terms that describe furnishings very often also describe interior spaces, furthering the linkages between furniture and space. The meaning of these terms has evolved with time and place.

This point further demonstrates that words describe furniture and space, not only as objects and rooms, but also as experiences, or the anticipation of use. Consider the Italian word for table, *il tavolo,* and then consider the word that describes a prepared table setting ready for a meal *la tavola*. The first describes an object using the masculine form and the second describes a setting for a meal using the feminine form.

We see distinctions in nearly all furniture types (i.e., *table* can be further characterized by the following prefixes: *bedside, dining, kitchen, work, coffee, changing,* etc.).

The Danish word for interior space is *rom* which, roughly translates into English as *room*. The Danish term *hygge* derives from 16th Century Norwegian term *hugga*, meaning *to comfort*, and describes the characteristic of a cozy and comfortable place. This description relates to the English word *hug*. Its meaning is endeared within the Danish culture. Embedded in words and synonyms linked to *furniture* and *space* are descriptive terms complementary to social use (eating, studying, sleeping). Words that describe furniture and space create a shared lexicon useful to designate and delineate use and purpose. The lexicon contains a broad spectrum of words that are dependent and aligned with culture, time, and place. Consider the etymology of the word *room* as it relates to time and domestic space. The word *room* has many translations in both French, *sale* and *chambre*, and Italian *camera, sala,* and *stanza*. Each term suggests a typological basis for its meaning and arrangement in the home. The notion of a flexible open space, void of activity or intended use, without distinct purpose or descriptive social use, is limited to the generic word *room*.

However, many rooms in the home are specific in their meaning and dependent upon *place* and *gendered use* (i.e., the clean room in India, the widow's walk from Victorian times, nursery room, or the

man cave in the USA). Further, some spaces are primarily dependent upon the theme of *time* (i.e., breakfast nook). Consider areas in the house that denote specific social use (i.e., the laundry room, pantry, parlor, guest bedroom, game room). These terms hold societal meaning and, in some cases, were in some other time embedded with gendered use. We also identify spaces that have multi-functional use, such as: a loft, a habitable kitchen, a living room, a garden, or terrace.

As we have associated distinctive meanings between the words, *furnishings* and *mobile,* consider the word *equipment,* used in the late 1920s by Le Corbusier and Charlotte Perriand that embodied a new paradigm of *furniture as equipment* for the home. In this context, *equipment* are products that serve the user and embellish the home and are not necessarily moveable. If the home is filled with equipment, we should consider how they equip the user, how they are used, where they are used, and how comfortable or suitable they are. Therefore, in the next section we will focus on the human dimension and explore its evolving role in the domestic landscape.

1.4 The human dimension of furnished space

Thus far, we have introduced the concepts of furniture, space, and collective housing, and now we turn our focus towards the human dimension that exists in the domestic landscape. We further expand our definition of the human dimension to include:
- Social and behavior components of domestic space.
- Ergonomics (the study of how people work and do things) and proxemics (the study of how people use, behave, and communicate in and through domestic space).
- Private, communal, and gendered space.

In Europe today, the desire for luxury remains, however a broader need for social democracy has emerged, especially in the post pandemic society. Concepts of individual and communal space are no longer binary nor absolute in their functionality. Nor are domestic spaces clearly recognized or partitioned as gendered (male or female) or age-dependent to the degree that domestic spaces have been in the past. Contemporary domestic spaces are inclusive of complex human

interactivity, blurred by multi-functional and overlapping use that calls into question singular-use conceptions of space. Consider the multi-functional activities taking place in the following spaces in the house:

- A loft.
- An open living area.
- A habitable kitchen as a place to cook, study, meet or eat.
- A guest bedroom used as an office or studio.
- An office or studio used as a guest bedroom.

The idea to consider here is that the *use(s)* of space is sometimes out of sync with the *name(s)* assigned to specific spaces as both variables tend to shift over time. More important to think about is that the activity occurring in domestic spaces is neither exclusive nor explicit today. Users in living spaces gather, eat, study, play, sleep in multiple places. Furnished space and societal values are, nonetheless, identifiable through what we call, *the human dimension* and through what we see in *furnished domestic space*. Together, the visible and invisible dimensions contribute to the concept of *making place*. Place is nearly always context and time-dependent, linked to its surrounding site and nearly always embedded with cultural meaning and societal values. This has been the case throughout time and should continue in future movements such as the one forming out of the COVID-19 crisis, which has given us pause and an opportunity to re-examine the relationships between domestic space, furniture, and the human dimension.

1.5 Looking beyond the pandemic

The COVID-19 pandemic has challenged traditional concepts of private and communal space, in part because people were recently confined to their homes 24/7 due to austere lockdown measures to contain the spread of an unknown virus. Many renters and homeowners were constrained by resources and space in response to these lockdowns. Suddenly, having to multifunction 24/7 in one's home with other family members or mates elevated the importance of the human dimension in space. While spaces may have been zoned for

specific uses before the pandemic, those spaces had to flex for other functions as well. And this prompts us to rethink the concept of time and cyclically, regarding the assumptions held about the need for a flexible system involving the use of space and furniture in the house.

Today, designers and furniture companies need to reconsider affordable, sustainable solutions to help improve the newly realized, home and work lifestyles, now pervasive throughout Europe.

What furniture products (contract and custom), interior design solutions, and user strategies (re-using, leasing, and co-sharing) are best able to address the challenges in creating a flexible and sustainable lifestyle for the future? Instead of buying to own, is a leasing or sharing model viable today? Can contract furnishings adopt multifunctional use or circular economy (CE) models? Will architects and developers allocate more square meters and utilize technological systems for rooms to be smarter and more interactive?

To learn from disruptive patterns such as these, European companies are already responding to lifestyle shifts and undergoing measurable changes in terms of manufacturing, environmental considerations, and marketing strategies. Recent initiatives, such as the EU Green Deal, have the goal to eliminate greenhouse gas emissions by 2050. This goal will certainly impact how furniture will be manufactured and will encourage social democracy and CE models as ways to move forward, working broadly to creating smarter living solutions. At the same time, during the pandemic, people have retreated into their domestic spaces to live and work remotely, and not all have adapted well to this new lifestyle.

Furnished domestic spaces have become real-time experiments, evidenced by conflicts emerging between living and working, spatial constraints and furniture use, available technologies, and the need for privacy. Shared spaces can be a challenge when social distancing and quarantining are required within a home. This is especially amplified when multiple or extended family members under one roof share resources. This lifestyle is expected to remain for an indefinite time.

To understand where future solutions might take us, we briefly consider some iconic furnished spaces that have served as identifiers of time, and we note how furniture and equipment resulting from a specific context have adapted to new uses, users, and scenarios.

1.6 Furnished spaces as identifiers of time and place

We look to examples of furnished spaces that are embedded in *time* and *place* focusing in this segment on the rise of Modernism and the geographic context of European countries. We sought to study furnished domestic spaces that drew furniture and space together and could serve as case studies to further understand time and place. Following are examples.
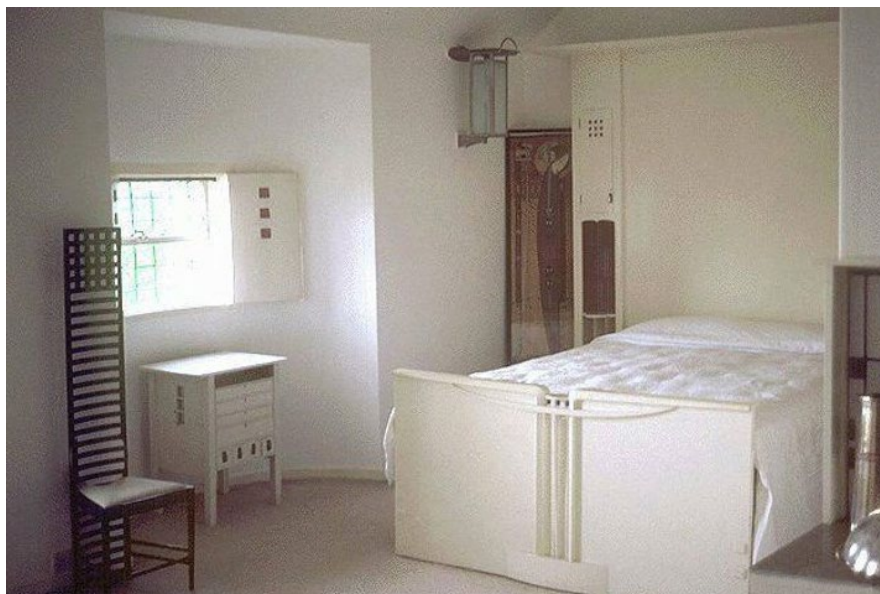
Fig. 2 - Furnished Bedroom with the Hill House 1 chair at Hill House, Helensburgh, Scotland. Designed by Charles R. Mackintosh (1902-04). Image courtesy J. Postell

The Scottish architect Charles Mackintosh (1868-1928) opened the door to a new modernism emerging in Europe at the turn of the 20th century. He designed furniture and interior spaces whose designs were rooted in the arts and craft tradition. His approach in designing furniture was complementary to his approach in designing interior spaces, such as in his work at Hill House (1902-1904) in Helensburgh, Scotland. Hill House stands as an example of highly crafted interior spaces carefully intertwined with machined furnishings that were designed, fabricated, and positioned to complete this domestic space.

The ebonized ash wood, ladder back chair, located in the master bedroom of the home, was one of several furniture pieces designed by Mackintosh to complete and complement the interior spaces in Hill House. In 1973, The furniture company Cassina included this chair, originally designed for Hill House, in their *I MAESTRI* collection as the Hill House 1 chair. Cassina updated the iconic chair with artisans manufacturing the chair in ebonized ash and upholstery using modernized manufacturing processes from their facility in Meda, Italy.

The next example is Villa Savoye, designed by the Swiss architect Le Corbusier for the Savoye family's weekend home. The home was constructed between 1928 and 1931 in Poissy, a northwest Parisian suburb. It was Le Corbusier's eighth house and considered by many to be his best residential work, embodying his five principles of modern architecture, which became pillars of the *International Style* and the realization of his 1927 manifesto *Vers Une Architecture*. In the manifesto, Le Corbusier stated,

> A house is a machine for living in (Le Corbusier, 1986).

In the phrase, Le Corbusier argues that a house is an efficient tool to help provide for the necessities of life. The LC4 Chaise Longue paired and used within the villa. The furniture collaborations between Charlotte Perriand and Le Corbusier were deeply reflected in the notion of equipment, utilizing industrial techniques and crafts, standards, and diversity. Perriand's Chaise Longue LC4 chair was not designed specifically for Villa Savoye though it was designed at the time Le Corbusier was working on the villa. The LC4, like the villa's main living space, was raised from the ground using a support-base which enabled user-adjustment in how one might experience the lounge. This design feature was unique. The ergonomic shape followed the natural position of the body, and it is considered a landmark in the history of modern furniture. In 1965, the chair was manufactured by Cassina. The LC4 Chaise Longue held the human body at the center of the concept: making relaxation the main feature of the design. The LC4 Chaise Longue fits well within Villa Savoye. Its presence in the villa underpins the modernist concept of furniture as *equipment* (a machine) in which to relax.

The Finnish architect Alvar Aalto (1898-1976) designed furniture that always resulted from his architectural commissions, an example being the Viipuri Town Library at Viipuri, Finland in which he designed the iconic stacking stool 60 (1932-33).
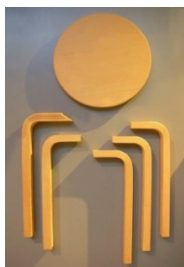
Fig. 3 left - Stool 60 at Artek, Helsinki, Finland. Designed by Alvar Aalto (1932-33).
Fig. 4 middle - laminated birch components for the Stool 60.
Fig. 5 right - formwork for the curved legs of Stool 60.
Images courtesy J. Postell

In his own words:

A lamp and chair are always part of an environment. It has usually been like this: When working on the construction of a building, I noticed that such furnishings and appliances were necessary to create the right unity, and then I designed them. The fact that later they can also fit into another environment is another story (Girsberger, 1963).

The contract furnishings of Alvar Aalto were all designed to complete architectural projects and were later manufactured by Artek to fit comfortably in a wide range of interior spaces throughout the world. The popularity of Stool 60 introduced the work of Alvar Aalto to the world. At the same time, the global sales of the stool shadowed the significance of its original presence in the library at Viipuri, Finland, nearly ninety years ago.

The Italian architect Franco Albini (1905-1977) designed domestic spaces that were complemented by his furniture, following the pillars tethered to the rise of post-war *Modernism* (*lightness*, *simplicity*, *space*). Albini's work with domestic space and furniture was unique in that he often included personal and family treasures side by side with his more modern designs, creating harmonious domestic spaces.

Poltroncina Luisa was designed in 1938 for Villa Pestarini (1938), completed early in Albini's professional career. The original design of poltroncina Luisa underwent fifteen years of design development and revision by Albini, until 1955, when Cassina began production of the last version of Poltroncina Luisa. It was the same year Franco Albini received a *Compasso d'Oro* for the chair's design. Today it is an iconic chair design from the 1950s, embodying modernist pillars of lightness, space, and craftmanship and is part of Cassina's *I Maestri collection*.

Fig. 6 - Villa Pestarini (1938) Designed by Franco Albini. Image courtesy Fondazione Franco Albini.

Fig. 7 - Finn Juhl's Chieftain chair in his furnished home in Copenhagen, Denmark. Image courtesy J. Postell

In 1941, the Danish architect and furniture designer Finn Juhl (1912-1989) designed and furnished his own house outside Copenhagen. Nearly all the interior spaces of this modest house were completed and complemented with Juhl's furniture designs, highly crafted in their fabrication. Finn Juhl's home is truly unique because the interior spaces are dependent upon the careful positioning of furniture that creates a utility and sense of *hygge* (cozy and comfortable space) throughout the open rooms. The last example of an iconic furnished space is the Royal SAS Hotel in Copenhagen, Denmark, designed in 1958 by Arne Jacobsen, a Danish architect and designer whose work built upon Denmark's modern heritage. He designed the lobby areas and all the guest suites to include his furniture designs such as the Swan chair, the Egg chair, and the 'Giraffe' or Drop chair, along with custom and built-in millwork. The chairs proved to be versatile for the spaces in the SAS Hotel, and successful in both their corporate and residential settings. Today Fritz Hansen manufactures Arne Jacobsen's chairs, marketing and selling the chairs to consumers around the world.

Fig. 8 - Room 606, SAS Hotel, Copenhagen, Denmark. Designed by Arne Jacobsen in 1958. Image courtesy J. Postell
Fig. 9 - Egg and Swan chairs manufactured by Fritz Hansen since 1958. Sketch courtesy J. Postell

These case studies highlight a range of technical and functional ideas connecting furniture and domestic space to the themes of time and place. Each example demonstrates how architects used design values within an architectural movement and how they responded with

current technology, current values regarding the human dimension, and utilized design pillars influenced by time and place.

The furniture pieces shown in these case studies, all have gained international recognition as important works of cultural heritage. Additionally, the furnishings have generated global success as contract furniture, extending their value and identity beyond their original context. They are now made available to a broader market for use in unexpected and different spatial-use contexts extending beyond the limits and boundaries of time and place. Now, we examine domestic furnished zones in the home as we know and have known them, in greater detail.

1.6.1 Domestic zones

Domestic zones sync with the interdependencies of space, furnishings, and time. The environments explored in this section include:
- The kitchen and bathroom.
- The home office and home study.
- Multipurpose spaces.
- The bedroom and places of rest.
- Welcoming, entertaining, and lounging spaces.

1.6.2 The evolution of the kitchen

The contemporary kitchen is considered the core of the house. It is both functional and welcoming, as well as comforting. It is one of the less formal spaces of the house, where we gather with friends and where we share chats and prepare food. It is usually fully equipped with many appliances that support cooking, for sharing time together and, at the same time, may show the status of the owner of the home. Nowadays, like all the other spaces of the house, the kitchen is considered from a functional, a symbolic, and a psychological point of view. Indeed, with the innovation of appliances and changes in lifestyles, the kitchen has evolved from a utilitarian space to a focal point and a social spot. But this vision of the kitchen is quite recent,

since for many decades functionality was the main objective of kitchen design.

Before the Industrial Revolution, the kitchen was simply a functional space to prepare food on wooden tables and store it in baskets or bags, with a centralized wood-fired hearth for cooking and heating. This space was used also for bathing, being the only heated space of the house. By the end of 19th century, the introduction of built-in ovens and stoves inside wealthy houses started to change the concept of the kitchen space. In fact, in mansions the kitchen was designed as a proper room used only by servants, located far from the dining, and living rooms to avoid the smells and noise from bothering guests. Despite new appliances and the size of kitchens, in wealthy houses food was preserved in separated areas equipped with wooden cabinets such as pantries, larders, butteries, and icehouses. An example is the Red House, located in south-east London, designed in 1859 by Philipp Webb and William Morris. In this mansion the kitchen is along the service corridor and the pantry separates it from the dining room. The same approach can be found in Palais Stoclet in Brussels, Belgium designed by Josef Hoffmann, and built between 1905 and 1911. This kitchen is characterized by two big wooden tables located in the center of the room, used by staff as islands for food preparation, surely not aimed at socialization like contemporary kitchen islands.

By the turn of the century, thanks to industrialization, both the middle and working classes grew rapidly. Consequently, small suburban residences, urban apartments buildings and social housing spread, leading to new changes in kitchen design. A major change came in 1926 with architect Margarete Schütte-Lihotzky's proposal for a new standardized kitchen arrangement known as the Frankfurt Kitchen. It focused on the concepts of labor-saving and timesaving solutions for women. Schütte-Lihotzky separated the kitchen from the living area via a sliding door and arranged the stove complex (that included the gas stove, the cooling counter, and the hay box) on the opposite side of the long working space with the wet complex (that included the sink and the draining board). Since the early modern kitchen still lacked a refrigerator, Schütte-Lihotzky introduced coated drawers, developed with the German aluminum company Harrer, to address the storage of perishable food. There were also space-saving solutions such as the fold-out ironing board and the suspended dish

rack. The Frankfurt Kitchen was one of the first efficient kitchen designs, presented to set an example for modern living in small apartments.

A further change in kitchen design can be found in the Usonian houses by Frank Lloyd Wright. Designed as practical houses for middle-class people living without servants, they have the small kitchen incorporated into the living area, opening it up to the dining space. An example is the 1937 Jacobs House I in Madison, Wisconsin, with its small, fully equipped kitchen visually hidden behind a wall but facing the dining area which is part of the living room. No door separates the kitchen from the rest of the house. This arrangement can be considered as a first step towards opening the kitchen that is visible a few years afterwards, in Charlotte Perriand's kitchen design for the apartments in the 1946 Unité d'Habitation by Le Corbusier. Her kitchen equipment included modular, built-in cabinets, an electric stove, an oven, and a sink with a waste disposal unit. As an integration with the living areas, Perriand designed a kitchen-bar, providing a functional element (a counter with sliding doors for storage) and at the same time an opening that allowed the woman to interact with her family and guests, without feeling isolated (Barsac, 2017).

A further development in kitchen design can be found in some of the houses of the *Case Study House Program* (Los Angeles, 1945-66), an experimental project that envisioned new models for residential living in modern residences that could be easily built. In the Case Study House n. 22, better known as the Stahl House, designed by Pierre Koenig, and built in 1960, important innovations can be found related to the kitchen:

- It is the first space that one sees when entering the house.
- It is visible from the patio and the swimming pool.
- It is visually open towards the dining and living areas, but it can be hidden on the sides thanks to movable panels sliding on rails fixed on the ceiling.
- It is made up of four parallel elements, among which only one leans against a wall, while the other three are detached. This arrangement of *islands* allowed guests to communicate with the person preparing food and drinks, at the same time, it separates the functional area from the dining table and living area.

The evolution of the closed kitchen into an open kitchen physically involved three areas of the house that in the past used to be separated: the living room, the dining room, and the kitchen. From a psychological point of view, this transformation highlighted a new role for women, no longer confined in the kitchen. From a symbolic point of view, the kitchen became an active part of the social spaces of the house, involving each member of the family and guests in the preparation of food, changing the act of cooking from a domestic and functional activity to a social act. Consequently, materials and furniture used in the kitchen for storing, preparing, and cooking food have changed accordingly. Indeed, towards the second half of 20th century, kitchens became more decorative, being part of the living areas, and having a starring role (Kinchin, 2011). Examples of such transformation in the kitchen include:

- Freestanding appliances and furniture were replaced by standardized and modular cabinets.
- Metal cabinets and two-toned kitchens – one for cabinets, one for wall units – entered the market.
- Laminate replaced wood for continuous countertops, and appliances were coated in colorful enamel.
- Washable and colorful tiles covered parts of the walls and were used also for the backsplash.
- Acrylic knobs on cabinets replaced metal and wooden ones
- Kitchen islands with drawers, shelves, and eventually sink became popular both as gathering points and as functional elements for the work triangle, that focuses on the efficiency of the arrangement of sink, stove, and refrigerator.

From the '80s, improvements in technology have offered designers ways to experiment with functionality and appearance. An example is K2 designed by Norbert Wangen for Boffi. It is a compact kitchen equipped with an oven, a microwave, a dishwasher, and a fridge. It works for both cooking and entertaining, thanks to the top that, when slid, has multifunctional use as a bar counter, a working top, or a dining table, allowing the use of the sink with a pull-out mixer, and of the induction hob.

Also, the introduction of the term, *domotics* has entered kitchen spaces, influencing the human dimension. Technologies applied to the

kitchen area have focused on digital appliances, computer software and interactive, smart design, adaptive sensors, dimmable LED lighting, and range hoods and ovens programmed by the computer. An example is Aura 3.0 by Miele, a pendant hood that can connect to a Miele hob through Con@ctivity, an automatic function that adjusts extraction performance reading the values set on the hob. It can also be controlled by a smart device using the Miele@mobile app. It is designed so to be used on an island, in a big open kitchen.

Despite housing problems that from the '70s forced people to living in tiny apartments, the typology of the open plan kitchen with a priority given to both aesthetics and function survived the decades and has reached the present day. Confirmation that kitchen appliances and furniture are chosen for functionality and visual appeal can be found in the production of many brands, who try to focus not only on ergonomics or technology, but also on the psychological and sociological aspects involved in contemporary living. Indeed, contemporary kitchen design focuses on respecting complex needs of users and on achieving an aesthetic style which is coordinated with the rest of the house. An example is Scavolini, an Italian company that is well known as a producer of kitchens since 1961.

Nowadays, it is introducing on the market a total look concept that involves the kitchen and the living area, for all those houses having an open plan kitchen. In fact, the *Fluida Wall System* is designed focusing on cooking, sharing, and hosting; it is a modular system that flows from the kitchen space to the living room, allowing the aesthetic integration of these two ambients to become one living space.

Another example is the *Living System* by Clei, an Italian brand specialized in transformable furniture since 1963. The system works for small spaces and can transform a studio into a multifunctional habitat thanks to versatile, modular, and high-tech elements. The kitchen module, when closed, looks like a wardrobe; when the front part is pulled out and positioned at 90°, a full kitchen appears, with a counter that is very similar to Perriand's concept.

Since the '60s, many open kitchens have turned living areas into multipurpose spaces to be shared, therefore they have been designed for the efficiency of people using the same space at the same time. But the recent pandemic forced people to adjust their use of space, demonstrating that the combination of dining room, kitchen and living

room in one – where to cook, eat, socialize, work, do homework, read, watch tv, listen to music etc. – doesn't satisfy everyone.

We must consider that in relation to the theme of 'time', the current notion of the kitchen space, along with its equipment and furnishings has undergone substantial change regarding the time people prepare meals and the time people consume meals. The evolution of the kitchen space, especially from the post-war period to the present day, has gradually witnessed a greater emphasis placed on the 'time' and 'place' of 'meal preparation' compared with 'meal consumption'. As a result, we have witnessed the marginalization of the dining room, as an independent room (typologically defined as such since the Baroque and Rococo eras) or of the *dining area* within the living spaces. On the other hand, because homes have become smaller and spaces have blended, dining areas have consequently become more and more intertwined with the living space, many with dimensions and configurations aligned with fluid 'living spaces', incorporating the traditional living-conversation area and the kitchen area. It should also be pointed out that the preparation of meals themselves has in many cases, become a sharing experience among friends and co-inhabitants, in some cases, taking on an almost theatrical dimension. This has influenced the design of the furnishings of the kitchen-dining area, and its equipment, including household appliances, dishes, and accessories, many of which have become emblematically iconic of contemporary design. This can be noted in the research and products developed by the Alessi brand, from the 1980s to the present day.

1.6.3 The bathroom: the experience of privacy

As the result of social changes and the development of indoor plumbing, flushing toilets, electricity, and heated water, the contemporary bathroom is not only a convenient space, but also a place of luxury, privacy, wellness, comfort, and wellbeing.

Before the Victorian period, when no indoor plumbing was available, domestic environments did not include a dedicated room of hygiene. People had baths in tin tubs in the kitchen, in front of fires, and bedrooms were equipped with wooden washstands with a bowl for

washing hands and face. During the Industrial Revolution, when indoor plumbing developed, houses started to include a proper room for personal hygiene and bathing, therefore the wooden washstands moved from the bedroom to the bathroom and changed into proper bathroom vanities with wall mounted sinks. Aesthetically they were similar to traditional chests, with woodwork and carving. Styles of vanities and fixtures changed with the Modernist Architects, along with the introduction of the *en suite* bathroom, but the concept of having a separate room for personal hygiene remained unchanged.

After the World Wars, the rise of the middle class demanded certain luxuries in the bathroom (i.e., more space for hair dryers and make-up products, showers, curvy and colorful sanitaries, proper ventilation), transforming this room into a private place, with the greatest privacy for taking care of one's body.

During the 20th century, the bathroom evolved from a hospital-like space to a place of relaxation, that nowadays include features of a spa, like in luxury hotels. Many brands are developing their products focusing on functionality, and aesthetics, considering that the contemporary bathroom is perceived as a proper living space, like the other rooms of the house. Indeed, nowadays designers and brands focus on the creation of the *experience* of this room, that involves:

- Lines and forms of sanitaries, basins, and faucets (i.e., round, square, sinuous, rectangular). An example is the *Giro Faucet* by Docol, that reveals its function only when handled.
- The finishings for floors and walls (i.e., tiles, concrete, resins, wallpaper, wall covering etc.) An example is the *Wet System* by Wall&decò, a technical wall covering for humid environments.
- The furniture (i.e., vanities, storage units, mirrors, accessories etc.) An example is the modular *Ingrid Collection* by Vika, that allows clients to compose their own wellness bathroom.
- The colors of furniture and sanitaries. An example is the collection *Kartell by Laufen* that includes colorful ceramic products and polycarbonate accessories.
- Lighting (i.e., must be functional and create the atmosphere). An example is the *Lamp Shower* by Nendo, that combines lighting with water.

- Sustainability (i.e., energy consumption and water saving, eco materials etc.) An example is *Axor One*, the collection of water-saving accessories by Axor.
- Technology (i.e., chromotherapy, hydromassage, etc.) An example is the sensitive touchless flush plate *Visign For More 20* by Viega.

As Giedion underlined:

The bath and its purpose have held different meanings for different ages. The way a civilization integrates bathing within its life, as well as the type of bathing it prefers, yields searching insight into the inner nature of the period. The role that bathing plays within a culture reveals the culture's attitude towards human relaxation. It is a measure of how far individual well-being is regarded as an indispensable part of community life (Giedion, 1948).

1.6.4 The office in the home or the home as an office

The heading for this section is not a play on words but summarizes two major approaches that characterize the relationship between home and work. Living spaces and workspaces share an increasingly current development due to smart working and people who work from home thanks to the prevalence of communication technologies and computerization of work. The living room and the home office are two domestic places with parallel cultural and societal evolution. Initially they developed as distinct parts of the house, but at some point, in time, they merged into a single space defined by a series of furniture that combined multiple functions: living and working.

The origin of the living room can be traced back to the Roman house organized with the distribution of the rooms around a large public area (atrium), where family life was held. Even the bourgeois house distributes and concentrates its rooms around the family room or living room. Although often distinct from the dining room and the study room, the living room remains in communication with these rooms by means of doors or large openings, representing the whole family life. The study as an isolated and private room has its origin in the medieval monastic cells which were equipped with a desk, bookcase, and storage unit, along with a bed. A notable example of this furniture is found in the painting *Sant'Agostino nello studio* by

Vittore Carpaccio dated 1502, at the Scuola di San Giorgio degli Schiavoni in Venice. From the end of the 15th century, the *studiolo (small study room)*, characterized Italian Renaissance palaces as a decorated environment that housed books and collections. Located on the main living floor, it was intended as a private room for work and intimacy, not belonging to the public area of the palace.

Another example that shows the link between work and home is the 19th century artist's atelier, whose origins can be found in the medieval artisan's workshop that was an educational and productive place. The artist's atelier was both a studio where one could work, exhibiting, as in a theatrical space, tools, sheets, canvases, boxes, rags, as elements of creativity and creative capacity, and a place for living free from conventions, with places and furnishings positioned without hierarchy and with great flexibility of use. A development of this concept is the loft that is not characterized by distinct rooms, but by interconnected places defined through materials, furnishings, and accessories.

Specific types of equipment, such as desks, are necessary to support work and craft in domestic spaces. During the Medieval Ages, manuscripts and documents initially stored in monastery wall niches were moved into wooden chests as a safer method of storage and transport (Marangoni, 1938). The chests were then transformed into writing desks suitably scaled for a private home. By the 17th and 18th centuries, tables including compartments introduced new functionality into the desk or *secrétaire*.

> Even the studies of professionals and the small libraries of private houses assume (with the Empire style) a strange uniformity of appearance with the massive desk leaning against one of the longest walls, the chimere consoles, the secrétaire with doors … (Marangoni, 1938).

Despite different names, derived from the various historical epochs and places, these pieces of furniture developed both horizontal and vertical characteristics. They were suitable for writing and storing documents, books, and various materials, with a flap that opens to allow one to write and that when closed, hides personal items from view. Little has changed in the desk's functionality or materiality until the 20th century when new industrial materials were introduced and experimented with for uses of furniture. In 1926 Marcel Breuer began

incorporating tubular metal into furniture applications as a search for new expressive solutions suitable for both the home and office environments, and many other designers followed the same innovative path. This development of furniture intertwined rationality, functionality, and industrialism, while eliminating decorative applications identified with bourgeois culture of writing and storage.

Consider for example. the double desk that Marcel Breuer designed as a new piece of furniture for the home of Walter and Ise Gropius in 1925-26. It was fitted with drawers, shelves, and storage space below the writing surface. Above, was a thin horizontal shelf unit. The long double desk specifically enabled Walter and Ise Gropius to work side by side.
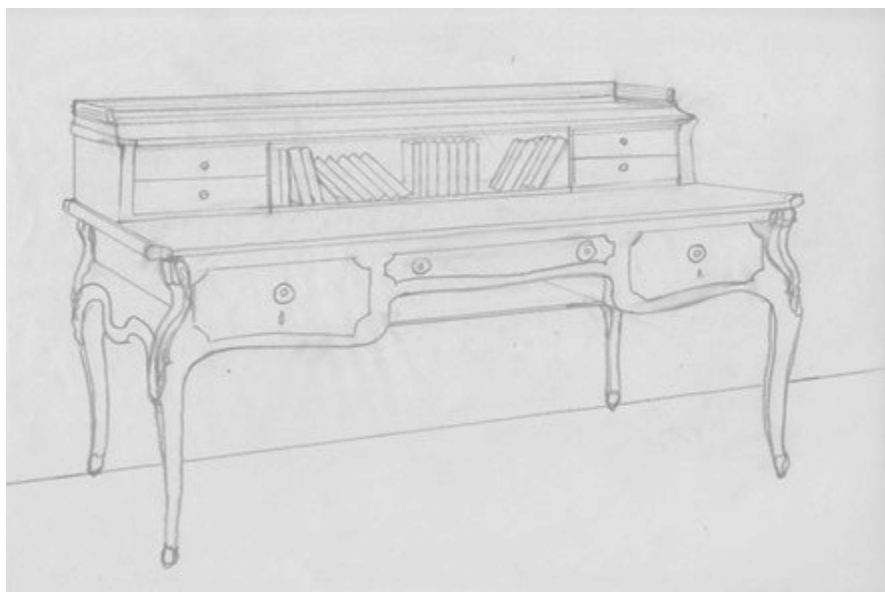
Fig. 10 - Louis XV writing desk (Marangoni, 1938). Sketch by Mauro Afro Borella

A final example of furniture equipment that remains important to the workplace environment is the bookcase. The repository of personal knowledge and creativity has survived as necessary furniture for both the living and the workspaces. In recent years, the home office has undergone a transformation of its constituent elements both in space and furnishings. The designer of a workplace in the home today is

called upon to address new approaches with smart working, which includes being able to access an individual workstation even for several people at the same time and allow their computer connection while safeguarding the privacy of each of them. Thanks to the laptop and IoT technologies, work has left the desk. It can be carried out in any part of the house, (i.e., corridors, floors, couches, bedroom, or a balcony), on or at any horizontal surface that allows one to place the laptop and plug in. The ideal furniture solution for a tech home is more flexible, hybridized, and less standardized.
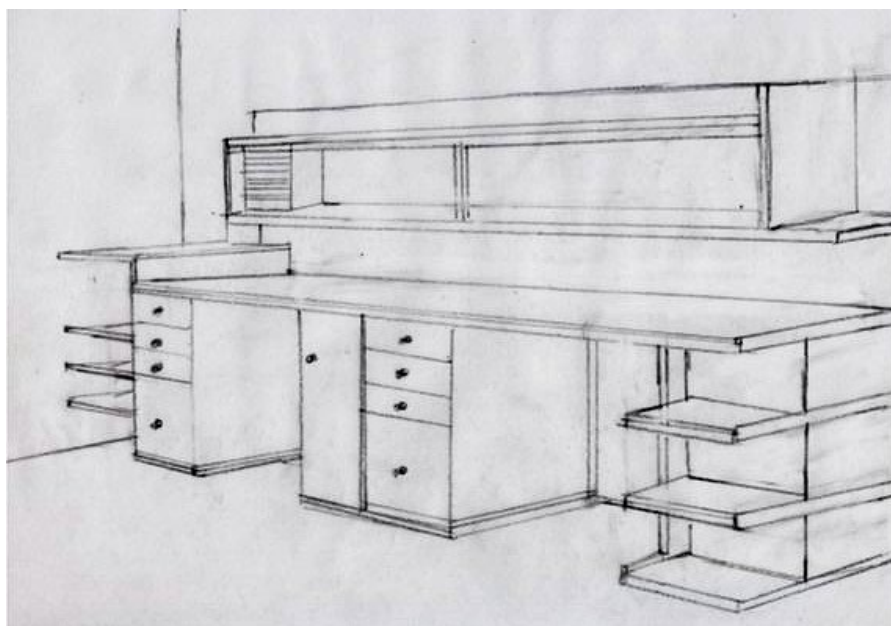
Fig. 11 - M. Breuer 1925-1926. Double desk Gropius house. Sketch by Mauro Afro Borella, 2021.

As Bachelard (1975) writes:

The closet and its shelves, the secretaire and its drawers, the chest, and its double bottom, are true organs of secret psychological life. They are mixed objects, object-subjects, they have like us, through us, an intimacy.

These objects have survived the centuries because they have proven to be flexible in materiality, scale, and purpose. Today, one of the

challenges in contemporary projects is the simultaneous co-existence between activities, users, and space, especially in living spaces that have increasingly smaller dimensions. Many of these spaces are generally not able to be dedicated to singular use, except in rare cases. Flexibility is essential, and new technologies can offer useful support.

The performance of work activities in the home environment appears to be more and more interrelated with moments of leisure or entertainment, and not rigidly separated in a specific time. The idea of a dedicated environment for work no longer makes much sense. However, it is necessary to allow for adequate privacy and acoustic isolation for those who work, but also the appropriate psychological and symbolic self-recognition of the tasks and roles, without penalizing the users. New frontiers in the relationship between space and furnishings, as well as in the design of the furnishings themselves are offered to designers, and design is called upon to play a fundamental role.

1.6.5 Multipurpose spaces: transformability and flexibility

Today's society is influenced by a continuous increase in population and urbanization (UN News, 2014). According to the same United Nations Urbanization report, the number of people living in large cities is set to increase by 66 percent by 2050. The increase in the urban population and single-person households (Bachman & Barua, 2015) has led to an increased demand for flats, a sharp increase in market prices and the construction of smaller and smaller flats (Lem, 2009). This trend creates two problematic issues: fewer people living per square meters, and fewer options available to furnish spaces.

In addition, many landlords have further subdivided flats into smaller and smaller units to make prices more affordable in the market (Thøgersen, 2017). Furthermore, the perception of what is a small flat has also changed over time. At the end of the 20th century, small flats in urban settings were around 55 square meters (Jørgensen, 1990) while today the same definition applies to areas of 10-15 square meters. This trend marks the minimal space that can be walked on (Schmidt & Guttu, 2009), while furniture and personal effects occupy the same space as before (Garathun, 2017).

Smaller flats are mainly composed of one or two rooms. This forces the use of the same room for several activities, thus making them multi-use spaces. Often, the living room, bedroom and kitchen are in the same room, although each of these areas should have distinct characteristics. Consequently, there is no room for standard-sized furniture, such as a separate bed, table, or sofa, but instead relying on space-saving furniture solutions (Thøgersen, 2017).

Despite the intelligence of furniture design, these small, multi-purpose spaces can quickly give a crowding effect, i.e., the psychological feeling of not having enough space available (Kulkarni, 1984). The difficulty of adapting to these models has led to experimentation with more flexible housing models.

Flexibility is what characterizes good spatial design, i.e., the ability to be variable and adaptable to changes in the lives of users, or in relation to use over time (Canepa, 2017).

The issue of the flexibility of the housing unit was first addressed during the early 20th century when the great masters of European architecture highlighted methodologies and technical solutions to solve the problem of housing. Thanks to the application of design criteria inherent to small spaces, it was possible to achieve high quality performance based not only on the rational organization of space but also on the relationship between building and furniture (Canepa, 2017). "The minimum dwelling unit" was the central theme of the II Congress of Modern Architecture (CIAM) held in Frankfurt in 1929, with the invitation to reflect on the minimum size of the dwelling and the formalization of design ideas using criteria of rationality and economy (Canepa & Vaudetti, 2010).

During the following decades, the integration of furniture and architecture has been experimented with to optimize the space of the home, making it as flexible as possible. Wall units become "closed or open containers", combining the functions of separation and aggregation between rooms. Thanks to this, the interior layout of the home becomes more fluid and versatile, allowing a piece of furniture to be completely or partially hidden at various times of the day. The kitchen was an example of this: it provided concealed, sliding, or closing solutions. Flexibility of use could also be achieved by means of sliding panels which divided the open space into areas dedicated to specific functions within the environment.

The history of architecture and design bears examples of great impact such as, Gerrit Thomas Rietveld's *Schröder House* built in Utrecht in 1924. The first floor of the house for Ms. Schröder and her children was spacious, simple, and functional, thanks to clever solutions such as the use of sliding panels on tracks fixed to the ceiling.

During the day it was an open space, but in the evening the Schröder family could divide it into separate rooms, to give everyone some privacy. Le Corbusier, together with Pierre Jeanneret, built the *Twin House* as part of the Weissenhof district in Stuttgart in 1927. It was constructed for the Second International Exhibition of the Deutscher Werkbund titled *die Wohnung* in which internationally renowned architects participated, coordinated by Mies van der Rohe. The aim of the house was to achieve maximum transformability of the interior space. The two buildings constituted a single-family house and a two-family house, based on the concept of the formal/functional polyvalence of space: the space was transformed over time. At night the beds were pulled out of the wardrobes thus, transforming the living area into bedrooms, using sliding walls (Lorio, 2018).

Looking briefly at an Asian contemporary example, we consider Shigeru Ban's *Naked House*, built in 2000 in Japan. This house consisted of a single large space on two floors in which four rooms on wheels could be moved freely according to needs. For example, positioned against the walls of the house; in front of heating or air conditioning units, allowing hot or cold air to flow inside; positioned next to each other to create a larger room, removing sliding doors. Finally, the rooms can be brought onto the terrace, allowing maximum space inside (Canepa, 2017). To reduce weight and optimize mobility, the rooms were not very large and contained a minimum of objects and accessories.

This living model is deeply linked to the culture of the Japanese home, where the relationship that dominates is that between the rooms themselves: *zashiki* (main room), *naka-noma* (room between two rooms), *tsugi-no-ma* (room next to the larger room). Flexibility is a concept that is very much present in Asian culture, which interprets the space of the home not as static and permanent but as dynamic, i.e., capable of accommodating change (Mooij, 2011).

Italian design has contributed to the evolution of flexibility in living contexts, offering some examples of multifunctional furniture to

transform the home during the day. This is the case of the *Total Furnishing Unit* designed by Joe Colombo in collaboration with Ignazia Favata in 1971. The living system is organized in four blocks: kitchen, wardrobe, bathroom, and bedroom with privacy. The wardrobe, when pulled out, acts as a barrier between the kitchen and the bed and privacy area (including all the functions of living, sleeping, eating, and reading). The sleeping area is made with two pull-out beds, as well as the table placed under the TV cabinet.

Monobloc elements on wheels were a new idea of free, mobile, flexible domestic space. They appeared as real *transforming machines*, capable of producing new values and domestic functions that can be moved at will. The idea of home is transformed, liberating it from constraints and traditional subdivisions (Vercelloni, 2010).

Another example is Bruno Munari's *Abitacolo* designed in 1971, intended as a storage module adaptable to the personality of the young occupant. It was conceived with the idea of offering children an area that allows them to find a space for every object and activity: from books to toys, to a space for sleeping. It became, therefore, not only a bedroom, but also a study, library, and wardrobe. A high percentage of the world's population has a need that the living space solution, however small it may be, will be practical and intelligent, making the home as livable, comfortable, and harmonious as possible, for the number of people living in the space. Especially during and following the COVID-19 pandemic, many people have spent much of their time in homes that have become centers for work, exercise, education, and leisure. According to the Xiaomi Survey conducted in 2021, 70 percent of US consumers modified their homes to accommodate emergencies that resulted in inevitable lifestyle changes (Xiaomi Team, 2021). In addition, 3 in 5 respondents said their leisure and work environment merged into one, leading 79 percent of users to reconfigure at least one room in their home.

1.6.6 Places of rest and sleep: scenarios and archetypes

Places of rest and sleep are embedded with ideas of privacy, but some examples draw us towards ideas of collective, shared use like Thomas Jefferson's bedroom and his adjoining shared studio in

Monticello. Bedrooms can be embedded with notions of privacy and publicness, as well as notions of multifunctionality and gendered use.

In contemporary domestic space, the concept of privacy has been losing importance when compared to the past. The spatial and distributive social identity that privacy had commanded for centuries has changed significantly, and this has resulted in new and different types of furniture inside the home. The 20th century was formed from the *open plan* as the prevailing polarity in the distributive design activity of rooms as domestic spaces and in the relationship with the furnishings, have deeply reconditioned traditional paradigms regarding the distribution and configuration of domestic space. We particularly reference the entrance-living-dining-kitchen areas that have often assumed a dominant role in the creation of an open space, of greater relevance than other spaces of the house.

The bedroom was once dedicated to traditional values of rest and relaxation with an intentional private dimension. It has lost that centrality of attention that was identifiable to the bourgeois apartment of the 19th century. Even after the war of the last century, the master bedroom had an important role, not only from a dimensional and location point of view, but also for the presence of a *proto system* of furniture that fulfilled functional needs and highly symbolic of personal meaning. In this setting emerged the quintessential bedroom furniture that still defines the most private space inside a home. This includes the double bed with bedside tables, the chest of drawers, together with the closets, and other components and accessories (e.g., dressing tables, mirrors, screens, stools, valets, and hangers, etc.).

Mang describes *the bedroom of the couple* as corresponding with aesthetic styles and endowments of different furnishings of the "historicist eclecticism" (Mang, 1984). Another example of the time-and-place influence of the functionality of the bedroom, can be found in the Baroque and Rococo periods, when the bedroom was a multifunctional space, public, in visual and distributive continuity with the other rooms of the house and in which privacy was often only emphasized by the element of the bed with canopies and curtains that allowed a temporary isolation from the surrounding space. This isolation resulted in "*interiors within the interiors*" (Forino, 2000), as alcoves (niches and more secluded areas) inside the room to emphasize the privacy of the sleeping area and to ensure intimacy and warmth.

Contrary to the bourgeois apartment, in the humblest of homes, the bedroom transformed into a place during specific events, such as illness, infirmity, birth and death, a place of public/private care and visit (Coppola Pignatelli, 1978).

1.6.7 The new bedrooms: their relationship with furniture

Even if at the distribution level, the separation between the bedroom and other rooms of the house is highlighted, there is a progressive reduction of its surfaces (Boeri, 1984) and of furniture fittings because the concentration of the post-modern bedroom is mainly placed on the bed, which is the functional element central to the relationship with the space of the bedroom.

The bed is increasingly studied as a functional element regarding both ergonomics and hygiene, and the relationship it holds with fabrics and linen. An example is the bed *Nathalie,* designed in 1979 by Vico Magistretti for the company FLOU. It was the first bed with removable and interchangeable covers, and the upholstery could be precisely coordinated with the bed linen, in the materials, patterns, textures, and colors of its component parts. If this furniture piece is the main component of the bedroom, what better way to enjoy it than to personalize the materials, textures, and colors. *Nathalie* is an example of furniture presenting itself more within the sector of domestic upholstered furniture (sofas, armchairs, and other accessories).

At the side of the bed, *bedside tables* serve and support the needs of the users. In some cases, they are part of the bed, being inserted in its structure, as for a long time happened in bedrooms of hotels, but also in the furnishing systems of many bedrooms designed in the post-war period up to the '70s. The archetypes can be found, for example, in the concept of *dashboard furniture* by Gio Ponti. In other cases, elements such as *bedside tables* are incorporated into the wall structure of reference (i.e., niches in walls made of masonry, plasterboard, or as part of the boiserie).

The bedside table is still necessary for the user experience in terms of storage and surface space for personal items that are characterized by the fact that they have an intimate and affective relational dimension with the user. Closets (a.k.a. *armoires*), on the one hand,

tend to be integrated into the margins of the sleeping space, with total or partial equipped walls, while in other cases, they can be replaced by isolated spaces such as the walk-in closet. This allocation of space for possessions has grown over the decades creating innovative design solutions for storing and retrieving clothes and accessories. Yet, these bedroom furnishings mimic the trends driven by the luxury market, which contradicts the user experience of smaller apartments and the necessity for more multifunctional solutions for each square meter of space.

In relation to the COVID-19 pandemic, the bedroom has found itself in a hybrid situation with the need to carry out work activities remotely and making use of the digital communication, the room has been the place of both rest and intimacy, and privacy needed to carry out activities of remote working (Scullica and Schoonbrodt, 2009).

The bed, and other furnishings, are important elements for the functionality of the sleeping space, but alone, they are not enough for the general comfort of the bedroom, that can be reached. Designers must consider as well:

- Natural and artificial lighting.
- The temperature of the room.
- The quality of fabrics, textiles, and window treatments.

The bedroom's private space of the couple or the individual becomes important regarding its definition of rest, but also in its functional areas and environments distinct from those of rest to include areas where you can concentrate and find a level of privacy using technologies to connect to other work activities.

1.6.8 Changes in the definition of users and their habits and behaviors in relation to the bedroom and private space

Until the end of last century, a social scheme of reference for architecture and interior design referred to three macro-segments of users that had characterized the era of industrialization from the 19th century. These users were defined as *rich, bourgeois,* and *proletarians.* In this sense, users who belonged to social groups of medium-high economic level, could in fact display, more than in the

past, many differences in their lifestyles, in their preference for certain aesthetic-communicative languages, as well as in their orientation towards different types of spaces and furnishings (Fabris, 2003). This led to the introduction of an extreme variety of spatial, furnishing, finishing, and technological solutions within homogeneous socio-economic targets. This factor had a wide impact on the hospitality sector and on domestic spaces (Fitoussi, 1992; Scullica, 2000).

In recent years, however, the process of user segmentation has gone even further. In fact, it is necessary to consider the changing habits by users in the use of a bedroom, such as eating in bed; watching TV in bed; but also using the sleeping space and bed itself as furniture on which to carry out work activities, as well as those related to the physical or psychological well-being of its users (i.e., from exercising practices to yoga and meditation). This trend is partly a function of smaller spaces encouraging multifunctionality, as well as the need of a bedroom to accommodate new technologies used in private spaces.

The time spent using the bedroom and its equipment becomes an essential consideration for configuring the space and designing its specific equipment. The bedroom becomes again, as it was in the past, a place dense with activities, many carried out at the same time by the users who share it, and some, in different moments of everyday life.

The time spent in the bedroom no longer corresponds to the traditional subdivision between *daytime* and *nighttime*, but in relation to the needs and behaviors of its users. Flexibility, transformability, and today's technological equipment make the bedroom dense and significant in relation to contemporary living, especially in the post-COVID era. In addition, in both design and use, the bed and bedroom have held important socio-cultural conditioning. We have been induced for centuries and probably for millennia, to consider the bedroom deeply related to the individual, man, or woman, or to a traditional couple. In the new contemporary society, we know that gender differences and ways of living together and intimacy between people exceed traditional definitions and behavioral patterns in referring to individuals, sexual orientation, gender, but also relational (convenient couples, casual partners) different and unconventional.

All of this can have impact the design of new, furnished spaces for rest and intimacy, in terms of the specific furnishing component, its configuration, and its materials, but also in its relationship with the

surrounding space, with implications, therefore, on the design of the furnishings, and also on the overall interior design of this private space in the home. The ability to find a dimension of rest and relaxation, promotes a way of life that has positive repercussions, both from a psychological point of view but also physiological, contributing (for example through regular undisturbed sleep) to the maintenance of their immune system in good condition, a factor that, in these years of pandemic recrudescence, appears to be another key element, to be taken into account in relation to the design of interior spaces, their finishes, technological equipment and systems and objects of furniture.

1.6.9 The space of personal hygiene in relation to private space

We have gained knowledge regarding the relationships between the bedroom and bathroom from the hotel environment, through a series of important experiments, especially from recent design boutique hotels (Irace, 1992; Scullica, 2000). Relationships between the space of the bedroom, understood as a *neo-habitational multifunctional* space and the bathroom area have shifted the concept of the bathroom as a *service place for hygiene*, acquiring instead a different meaning, more related to the general welfare of the person, but also a *living dimension*, an integrated space in the room. From hotels to homes designers have used bathrooms as places of experimentation for solutions of sanitary ware, material use, fixtures, and lighting. In the context of the *en suite*, 21ˢᵗ century bathrooms have become furnished spaces *of bedrooms*, highlighting relationships between the individual's body and the perception of intimacy and retreat for the users. The relationship between the space of the bedroom and that of the bathroom has important archetypes, like the example of Le Corbusier for the Villa Savoye in Poissy (Ottolini & Rizzi, 2005), where the open plan allows light to reach both spaces, and the curtain and the side cabinet provides enough separation for retreat and comfort. This archetype has come a long way from the utilitarian functionality of bed chambers.

The relationship between the bedroom and the bathroom space leads us to reflect on issues in which the concept of time is fundamental to the design. The bathroom, defined as a place where to carry out one's own hygienic practices in a rigidly compartmentalized and rationalized manner, to a place integrated with the bedroom, where the performance of hygienic practices takes on a recreational and playful value. The bathroom is not only the place of hygiene, wellness, and relaxation, but in relation to the behaviors induced by the sexual revolution of the late '60s, up to the new frontiers of physical and psychological identity. The bathroom and its areas assume a strong relational and experiential accent, extending its use beyond traditional and conventional activities and services.

1.6.10 Places of welcoming, gathering, lounging

Places of welcoming and social gathering in the home can involve nearly any space, but today, such places conventionally include: the entry, living room, the dining room, the library, the garden and terrace.

For many people, the kitchen and dining areas, differently from the past, are the primary public gathering spaces of their houses. For homeowners that have a garden or terrace, weather permitting, these spaces serve as welcoming places to gather and socialize. Secondary spaces such as a library or living room can serve as social gathering areas among friends. In the traditional living room today, where gathering and talking together once ruled, we note an emerging shift in activity from group gathering and discussions around a common table to smaller gatherings that focus on the TV monitor, where movies, gaming, and news are always shared. Here we can see virtual spaces evolving into welcoming places to gather even if such places are in private or semi-private spaces of the home.

Today's public domain for many is experienced through on-line communications and therefore wherever the monitor or cellphone is in the home, that place becomes the location and venue for public interface, radically transforming traditional spaces and areas in the home that were once relegated to social engagement. The smart and digital ways in which we socialize today have transformed interior space and interior furniture of the home. As new IoT interfaces and

digital technologies become permanent fixtures in the house, designers can reconsider acoustic and visual needs of the home, not only for those using these technologies, but also for those who seek refuge from housemates using these modes of social communication.

We can imagine, as spaces trend smaller and the use of technology grows, tension between retreat and gathering needs to be thoughtfully reconsidered. The designer's decisions are paramount to resolving this tension. The ways of using these spaces extend far beyond conventional and rationalistic conceptions of space and time. As with many other spaces in the house, the coexistence of simultaneous and different activities has resulted in new sensitivities regarding temporal variables, specifically in relation to the design of furniture and space.

1.7 A didactic inquiry on multifunctionality, nature, and ethics

In a didactic learning experience, focusing on furnished domestic space, we explore three concepts (*pillars*), valuable to consider in today's design solutions. We highlight *multifunctionality, nature, and ethics* to set the stage for students to explore design solutions of furnished, domestic spaces for co-living and co-working to apply the concepts of furniture and space as *identifiers of time and place* introduced in this chapter:

- Multifunctional spaces and multi-functional furniture.
- Sustainability, as an inescapable platform.
- Ethics, to keep the individual and community as a central reference and safeguard social identity in a democratic context.

In the fall of 2020, 3rd year Interior Design and Product Design students from the School of Design at the Politecnico di Milano (faculty: Francesco Scullica, James Postell, Raffaella Mangiarotti, Mauro Borella, Gisella Veronese, with Andrea Borghi, Fabio Daglio, Alessandra Sironi) explored strategies and design solutions for co-living and co-working scenarios utilizing design pillars of multi-functionality, nature, and ethics for a post pandemic present. Domestic space has always been about social hierarchy, the organization of

personal possessions, lifestyle, and the language of materials, lighting, and construction. But today, multifunctionality, sustainability and ethics have a more pronounced role in design. Students considered these aspects and explored design solutions for co-living and co-working at the borgo of Villa Arconati, an impressive Baroque villa from 1610, located north of Milano, Italy. Students were asked to incorporate in their work, three design pillars, which were explained and defined as:

- Multifunctionality: multi use, multipurpose, modular, collective, communal, and private, transgenerational, etc.
- Nature: sustainability, green design, bio, biomorphic, gardening, urban farming, food production, agricultural production, biomimicry, bioengineering, etc.
- Ethics: inclusion, empathy, accessibility, universal design, wellness, health, safety, welfare, spirituality, etc.

The Final Synthesis Design Studio (*New Spaces New Furniture*) was interdisciplinary involving students from product design and interior design. The didactic learning experience and the output of work focused on identifying design solutions and scenarios related to co-living and co-working capable of orienting production and the life cycle of furniture products in globally sustainable manners. In the exploration of new products at the scale of interior space, students considered the changing scenarios of life, work, and consumption, but also the technological, economic, ergonomic, performance context that characterizes the mass market today. From the context of the classroom, we present a few images focusing on one group of students (Fig. 12) who explored concepts of a furnished domestic space for a *maker's community* in support of co-living and co-working today.

Within the home ecosystem, which provides for the use of different spaces, at different times (day and evening), in different ways, students developed spatial configurations that were, above all, no longer minimalist open lofts, but complex and transformable living and working spaces, as seen in Fig. 13, showing various conceptual models. The home environment was to surprise and amuse, allowing users to adjust movable partitions and crafted furnishings.

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Fig. 12 - Students Co-Living and Co-Working Together. Image courtesy, G. Colli (Interior Design), P. Collia (Interior Design), J. Riccardi (Product Design), S. Pinto, (Product Design) L. Wilson (Product Design)

Addressing functionality of daily activities was encouraged, which aimed to transform living and working spaces into spaces for users to socialize, work, relax, watch a film, or travel with augmented reality.

Furnishings were conceived as modular systems utilizing sustainable CE models. Figs. 17 and 18 identify conceptual models of furniture solutions that address both retreating and gathering spaces in even the smallest co-living scenarios.

From a point of view, the *home* configuration has always seemed more attractive than the *office*. At home you can choose, depending on the task at hand, where to sit, whether at a desk to draw or on the sofa to read. Sharing the living space with other people, an enclosed room rather than an open living room, meets the need for privacy or socializing. Comfort and well-being are important psychological needs of in-home organization. This explains why the office also ends up being inspired by the domestic context, a place where people feel recharged with welcoming and open spaces, but also in areas that respect the desire for intimacy and tranquility (Homi Milano, 2021).

Starting with simple solutions, the hybrid space in the living space dedicated to work and recreation is furnished with new height-adjustable desks, circumscribed by mobile acoustic screens which, at the end of the day, can retract and hide the workstation and displays.

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Fig. 13 - Co-living and Co-working Scenarios, New Spaces, New Furniture LSF. Courtesy, G. Colli (Interior Design), P. Collia (Interior Design), J. Riccardi (Product Design), S. Pinto, (Product Design) L. Wilson (Product Design)

1 the basic flat unit

2 the casa-bottega

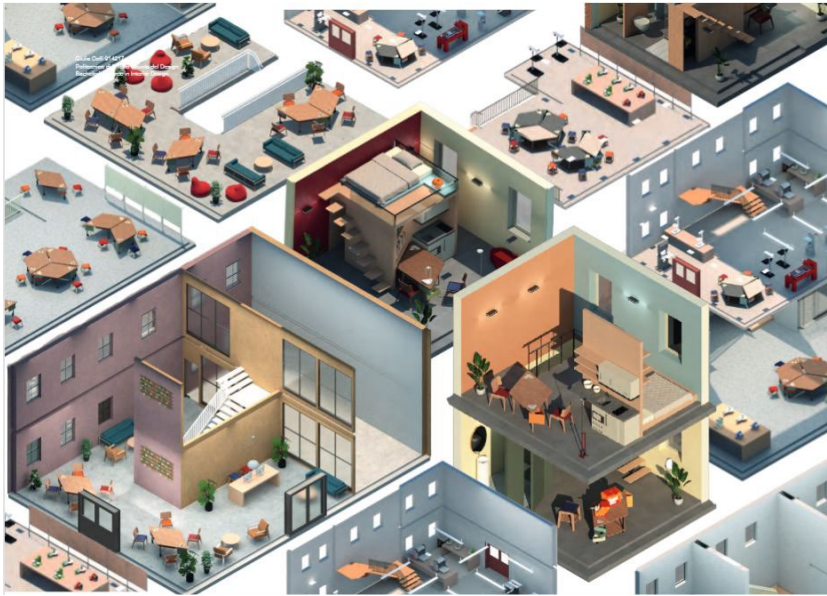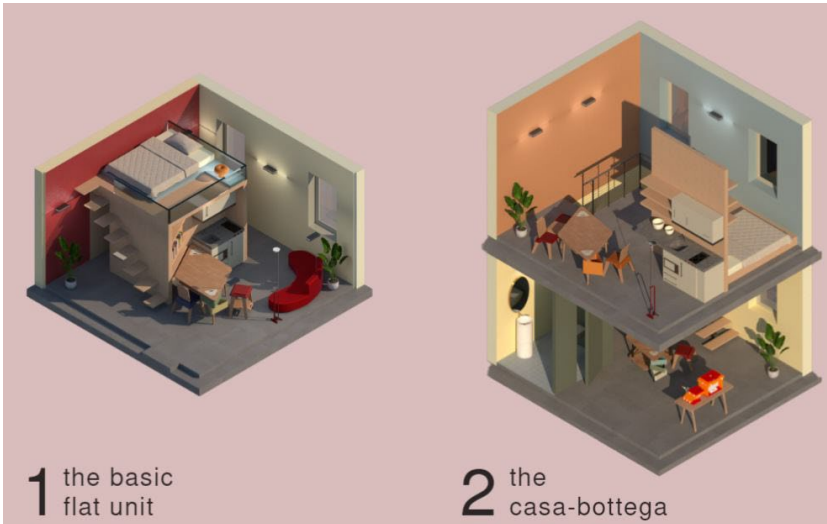Fig. 14 - Views of 25 MQ and 50 MQ Co-Living Scenarios, New Spaces, New Furniture LSF. Courtesy, G. Colli (Interior Design), P. Collia (Interior Design), J. Riccardi (Product Design), S. Pinto, (Product Design) L. Wilson (Product Design).

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Fig. 15 - Furniture Design Solutions Tethered to Co-working and Co-living. Image courtesy G. Colli (Interior Design), P. Collia (Interior Design), J. Riccardi (Product Design), S. Pinto, (Product Design) L. Wilson (Product Design).

Fig. 16 - 25MQ and 50MQ Co-Living Scenarios, New Spaces, New Furniture LSF. Courtesy, G. Colli (Interior Design).

Articulated partitions freely arranged in the home, compose different types of spaces, guaranteeing privacy and intimacy without isolating.

Students discovered that furnished domestic space can stimulate the co-liver to resolve the tension between communal and private use of space. Tables and chairs, reduced in size and movable, became *nomads* in the home, mixing agility, functionality, and modularity.

The latter responds to an option of choosing the size of a product and allowing a range of combinations dedicated to a specific space.

Technology, which until now, has been at the boundary of furnishings, and will soon cross the boundary by interweaving its capacity in a seamless manner, offering added value. Small components and accessories become versatile, mobile, light, flexible,

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and systematic such as drawer units which become useful both for organizing documents and as bedside tables around the bed.

Incorporating lighting into furniture may begin to address the limits of the socket. Thanks to dimmability and other controls, it is now possible to adjust the intensity of light and remote ambiance (Arper, 2021). Students explored domestic space giving rise to a transformable system that can adapt to the user, a flexible design solution that follows a philosophy of change and social democracy, including necessary innovations capable of reinterpreting user behavior and predicting solutions for future need.

Fig. 17 - Rendering of a 25 MQ Co-Living Scenario, New Spaces, New Furniture LSF. G. Colli (Interior Design), P. Collia (Interior Design), J. Riccardi (Product Design), S. Pinto, (Product Design) L. Wilson (Product Design)

The design work from the didactic exercises offers lessons about living and working in small domestic spaces and explores strategies for incorporating values of multifunctionality, sustainability, and ethics in the design of co-living and co-working spaces. It points to a fusion of private and communal spaces, and blurred divisions between living and working spaces in today's post-pandemic world.

1.8 Conclusion

In this chapter, the authors explored social use relationships and temporal linkages and boundaries between furniture and space and offered insight about the physical, spatial, and ambient environments of furnished living spaces, tethered to the human dimension, interwoven by design pillars that are linked to time and place.

Our primary conclusion is that many professions, tasks, and roles will have to be reconfigured to align with evolving new spaces and new furniture systems that pertain to the emerging needs of today's users. In addition, the design of furnished domestic spaces will respond to new social proxemics (imposed for example by social distancing which resulted from the recent pandemic), concepts of working at home, and between people and systems of space-product services and IoT technologies. It is necessary to note the technological acceleration and the irreversible processes triggered, which are asserting themselves into the home environment. If trends towards co-living continue, single-use spaces will no longer be practical, affordable, or comfortable. Every space will become multifunctional.

Moreover, when there is more than one inhabitant, design must address concerns for acoustics, privacy, a balance between collective and private activities, fluid relationships between interior and exterior space. Multifunctional furniture and spaces must be included in the design program to satisfy any domestic environment.

Collective living spaces (i.e., co-housing and co-living) and their furnishings today embody a wide spectrum of opportunities for shared activities and a hybridization of purpose and use. We have argued that concepts (*pillars*) of multifunctionality, nature, and ethics are necessary today to incorporate in the design, production, and daily use of living spaces, especially for those living in small, tiny homes.

Future research might point to new strategies and design solutions for domestic living that can inform the social emergency triggered by the COVID-19 pandemic. We are living in a new era *(time and place)* and a shift in attitude and vision is needed. Designers should consider that people may still feel the need of closing a door and escaping from the rest of the family in the years ahead. New solutions must be created that find a compromise between the desire for socialization, gathering, and welcoming with the need for private spaces. If it is not possible to

add more space to a house, then furniture and equipment, need to be multifunctional and transformable to make space adaptable, not people. Fundamental to the outcomes of this research are the strategies and guidelines based on the current values of social democracy multifunctionality, sustainability, and ethics in all its forms. These strategies and guidelines offer improved methodologies and practices to build and furnish interior domestic space, in response to the trends in residential design and the challenges set by the European Green Deal 2020. Considering the emerging trends can help future furniture designers and manufacturers, interior designers, and architects create new solutions and strategies for domestic environments. Today, more is expected from furniture and space, from products and equipment, specifically syncing the concepts of multifunctionality, sustainability, and ethics in the design and construction of domestic space. Domestic furnished spaces today attempt to maximize a balance between privacy and collective use, placing value on environmental design considerations. These values help serve as indicators of a new era underpinning our time and place.

Fundamental is the change of the temporal variable in relationship with the Space-Furniture-Services-System. The temporal variable enables new conceptions, methodologies, and strategies to the designer for considering ways to incorporate innovative systems and typologies in the design of furnishings and spaces.

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2. Human well-being and human performance demands as dynamic polarities to adapt new domestic interiors

by Barbara Camocini, Silvia Maria Gramegna
Department of Design, Politecnico di Milano

Abstract

The enduring pandemic and the compulsory stay-at-home condition offer the opportunity to examine some hints of domestic space renewal. The super-use of interiors, considering home as a place where 'to stay' instead of 'stationing', brought, on the one hand, an increasing focus on physical and psychological human well-being, re-calling the domestic space prime and primitive values as a refuge and, with it, the crucial importance of its physical and virtual borders, recognizing the importance of its identity and history.

On the other hand, our 'refuge' borders face the entry of public space with its features and functions into the private and domestic one. Our domestic scenarios recognize a new functional layer consisting of highly equipped and publicly visible spots.

As designers, we try to interpret these fragmented, spontaneous, and temporary spatial interventions as elements of a broader process of rethinking the domestic environment, according to a new interpretation of time, as dense, virtual, and prolonged. New fluid pulsing layers in which the polarities of well-being and performing demands make a complex open system.

They coagulate, dissolve, and re-assemble to embrace, protect and welcome their inhabitants' ever-changing needs.

2.1 Premise

The experience gained during the COVID-19 pandemic, with particular relation to the forced stay-at-home condition, has brought new needs and new stimuli to re-question the ways of living in the domestic space. Complex tensions contribute to the dynamic transition of inhabited interiors towards new scenarios. On the one hand, the requirements coming from the 'outside' often bring additional functions, belonging to highly adaptive and activity-based layer, to be carried out with methods and times mainly due to remote factors and tailored to the different inhabitants who perform these functions. On the other hand, this augmented functionality, together with the more intense use of the domestic space in terms of time and density, generates growing attention to its quality and impact on human physical and psychological well-being. This last layer concerns both the architectural container existing features (natural light, internal proportions, expansions to the exterior, etc.) and the cultural factors that generated it, which together constitute a more viscous time layer, more rooted than the previous one.

This contribution aims to identify the upcoming domestic habitats characters and their spatial organization generated by these polarities, analyzing how they overlap and interact with the current domestic status. The emergency nature of the pandemic period forced the inhabitants themselves to adopt intervention tactics which, by definition, are built using the resources available in the context of intervention, relating to the existing spaces with different gradients of impact, reversibility, and for more or less limited and marked times.

As both designers and users, inhabitants showed their ability to 'react adapting', closely connected to a concept of 'living and inhabiting' that does not necessarily destroy and replace the existing elements. This period, characterized by sudden and profound changes in daily life, works as a laboratory for experiments concerning domestic spaces. The persistence of the pandemic, and its oscillating trend between emergency and temporary return to normality, nourish a continuous observation of the legacy left by this experimentation.

However, the new ways of living and the corresponding spaces can be considered 'young' results, not yet mature, of the experiments. The passage of time and the persistence of new solutions, even when the

emergency reasons no longer exist, push the discipline that studies domestic spaces to evaluate the phenomenon critically, in a perspective that includes both contemporary scientific literature and periods historical in some comparable respects.

2.2 New scenarios for well-being, in COVID-19 emergency

The state of emergency of the ongoing pandemic of COVID-19 brings forth the need for a new concept of health and well-being in relation to the built environment, and beyond. The extraordinary historical moment we have been living in since 2020, is changing the rules of living, and the design of neighborhoods, buildings, condominiums, and dwellings in the name of marked respect for the environment, for our health, and for the dynamics outside and inside the home.

2.2.1 Architecture and the city

The ongoing pandemic, which nowadays has exceeded 300 million notified infections in the world and about 5.5 million deaths, is a strong reminder that urbanization has changed the way that people and communities live, work, and interact. Moreover, it made evident that, from now on, we need to transform the systems and local capacities in order to make them resilient to prevent the spread of infectious diseases (Capolongo et al., 2020).

Research on the association between built environment and health has increased in recent years. (Smith et al., 2012), in their research, reported that:

Improving neighborhood walkability and quality of green areas and providing adequate active transport infrastructure are likely to generate positive impacts on activity in children and adults.

From an architectural and urbanistic point of view, immediate actions concerning the future development of cities can be addressed to encompass planned flexibility of cities schedules, fostering a smart

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and sustainable mobility network, a defined set of services for neighborhoods, a strong digitalization on infrastructures at an urban level and the promotion of smart communities. From a medium-long term perspective, architects and designers could focus on designing new indoor flexibility of domestic living spaces to reach a higher level of comfort and well-being, tailored to new inhabiting practices we have experienced during the outbreak of COVID-19 (Capolongo et al., 2020). Moreover, urban planners and architects should further explore new building typologies fostering the presence of semi-private or collective spaces, new green spaces accessible at the level of each neighborhood, following the most recent debates around 15-minute cities (Moreno et al., 2021) and other related experiments. Moreover, the basic care services should be renovated, integrating the existing environmental emergency plans, with those related to health emergencies.

2.2.2 Domestic interiors

Italy was the first European country heavily affected by the COVID-19 pandemic and also the first to lock itself in. The lockdown, or home confinement, which took place from 8 March to 4 May 2020, was a strong and unexpected experience. During these months, in many cases, our homes have proved insufficient to meet the new needs of a family in terms of working performances, and socialising dynamics. Consequently, our homes seemed to have become somewhat obsolete. Moreover, one question became crucial: what impact does the home we live in have on our well-being? The lockdown imposed to contain the spread of the COVID-19 pandemic turned the homes of millions of people into workstations, meeting rooms, or classrooms. Suddenly our daily lives have changed; many have had to decide where to spend the next two months of their lives, staying in metropolitan flats or returning to family homes outside the city, sharing space with their partner, children, or family members every day. In the domestic context, the overlapping of different activities such as work, study, play, relaxation, etc. in small, confined spaces can strongly influence the personal well-being of its inhabitants and induce states of anxiety and stress and obstacles to work

productivity. Accordingly, certain features of our homes can have a significant impact on our mental and physical *well-being* and *mental health* (Connellan et al., 2013). The time spent confined to our homes has led us to discover many of their merits and demerits, and these become relevant when the home is lived intensively during the day instead of just in the evening. In general, Italians on average experienced their homes well and felt safe from external health risks. Psychologists called it the 'cabin fever', so much so that some felt uneasy about going out when they were no longer confined to their homes. Accordingly, housing has turned out to be as much 'refuge' as 'prison', comfort as well as oppression: the availability of square meters and private open spaces is the fundamental variable on which these dichotomies are played out. Even the more or less skillful organisation of interior spaces – often temporarily converted into a gym, office, classroom or study – affects daily well-being when, alone or with others but always in contact with what is outside, one is forced into isolation (Bassanelli, 2021). Those who did not spend this period in solitude had to add to their usual family and home activities those of work and study, with the consequent need to find an individual space where they could carry out their 'public' activities, without useless and embarrassing interference and intrusion. There are no pre-established recipes for imagining post-COVID-19 housing, but the health emergency has certainly shown how difficult it may become to live in flats built according to axioms that are no longer suited to the contingency, such as those of current housing built thirty years ago or after the Second World War. The forced stay in our homes has stimulated all of us to discover new spaces and new objects, never used before. As Alexander & Smith (2020) stated:

> The first few weeks and months were a remarkable demonstration of a societal capacity for highspeed bricolage as familiar structures of meanings (narrative, iconography, genre, binary codes) and meaningful practices (collective rituals, interaction rituals, and performances) were bolted and glued together in new ways.

This constraint, besides showing the limits of our homes, has helped us to understand how to live in a better way and, consequently, to imagine uses we had never thought of. Mainly, what home-confinement first, and then the management of this epidemic, has

taught us is how to rationalise spaces to make them functional for more cohabitants and more different activities. Teleworking (or smart working) in Italy, like in many other countries, has gained the momentum that many had been waiting for years. Everyone already had wi-fi and sufficient devices. The problem arose because of the separate rooms and ergonomic furnishings, from seating to lighting, etc., as well as the narrowness and the lack of space. Many young people who moved to big cities for work have a distance of 2 meters between their bed and their workstation, which becomes untenable in the long run. Many have purchased ergonomic back supports to adapt chairs already present in their homes. In isolation we have all exercised certain voyeurism in other people's homes, on video calls for work or friendship but also in public with journalists or politicians against the backdrop of ever-present bookcases, in fact, the glossary of the pandemic includes the expression 'credibility bookcase' (New York Times, 2020). Many people have planned – or at least dreamed – of having a house with multiple external views. In fact, terraces, and balconies, or at least views of greenery, made the difference during the days of lockdown. They alleviated the claustrophobia of those who had no views other than the windows, or who were enclosed between tall buildings in city contexts. Some lucky ones with a garden have even tried their hand at their first vegetable garden. Families with children who had a small garden made much use of these green spaces, using them as an outlet for playing with their children. Even while working, people have often sought the view of greenery from their windows, trying to bring a bit of nature into the home, even during the hours spent 'zoom calling'. In addition, the passion for green has evidently increased, in fact, a part of online purchases concerned plants, pergolas, tables, and outdoor lamps. The social distancing measures adopted by the various local authorities to contain the spread of the Sars-Cov2 virus have rarely included the possibility of safeguarding the need for physical exercise in the open air. In any age group, from children to adults, but especially in the elderly, physical exercise is particularly important because in addition to promoting good functioning of the musculoskeletal system it increases psychological and physical well-being, which are essential in managing stress and anxiety. Thus, very often small corners dedicated to gymnastics have appeared in our homes, equipped with computers

or smartphones connected to online yoga classes, gymnastics, collective and shared workouts, possibly with a view of the outdoors, a city park, or a nearby green corner. The most prepared have set up mats and exercise equipment in the home, either in the living room or in a corner of the bedroom. But there were also those who improvised dance evenings with their partners, to enjoy the pleasure of a little good music and a little exercise in their own homes. Understanding the next housing choices is in the interests of real estate developers, insurance companies, and banks, but also of town planning, architecture, furniture, and design. Thus, this experience, unique in recent history, has stimulated moments of reflection for architects, designers, and planners' intent on mapping out new ways of living.

The lockdown has breathed new life into the ideas of architects and designers who are designing. For example, new natural ventilation systems and automatic air changes that are open and no longer closed. Moreover, domotics has now paved a new horizon for domestic spaces: many designers envision new technical solutions to be implemented in our domestic spaces, such as control doors and surfaces with sensors, even wearable ones, or voice controls.

Accordingly, many functions may be touchless in the near future (even in the workplace) in memory of the contagions. Moreover, there is a growing awareness of synthetic materials, which seem to be giving way to increase natural materials, even germ-repellent ones such as bronze, copper, and brass. Respectively, Ludovica Di Falco, founder of the architecture studio Scape with offices in Paris, Rome, and Milan, says in an interview for Abitare Magazine (Botti & Pizzi, 2020):

It is necessary to imagine total freedom in creating a wide variety of smaller spaces dedicated to specific activities, so that the home can reproduce the same choices offered by public space: small alcoves in which to work, sleep, play an instrument or exercise, alternating with a single large room in which to gather. On the other hand, it is necessary to eliminate all spatial limitations, and to conceive housing where the minimum will no longer be surfaces but technical installations: electrical wiring and wi-fi, connections to the water and sewage networks, an outdoor space.

2.2.3 Which approach for the "near future home"?

The debate about the domestic environment has never been as prolific as it has been over the past year. Certainly, the debate on 'new ways of living' has always been crucial throughout the history of design, with architects and designers' intent on sounding out the new needs of contemporary society, and at the same time developing projects capable of accommodating these new needs.

COVID-19 certainly gave a big push, but perhaps some changes were already underway: the limits of domestic space, the need to accommodate new functions, hybrid, fluid, overlapping, and activatable when needed, and the need to achieve new domestic well-being.

What has certainly emerged in this period is the need to bring people to better understand their own *habitat*, to try to enable them to make the best use of their environments, and to understand them deeply. The long duration of the pandemic is likely to make the changes it induced under the emergency regime long-lasting as well. This means that the new centrality of the home in our lives, especially in the lives of those who used to consider it little more than a dormitory, will eventually become an accepted fact.

Of crucial importance becomes the question of well-being in living, which is articulated, on the one hand, in relationships with the other inhabitants of the house, of different ages, with different needs, who must be able to carve out their own spaces fluidly throughout the day, and on the other hand, in the ability to change domestic spaces, which are increasingly fluid and oriented towards the outdoors, customised to the habits of its inhabitants, also thanks to the increase in the number of people staying in the home and therefore the intersection of different activities, ranging from work to entertainment, relaxation and physical exercise. Which role can designers have in this period of profound changes?

2.3 Re-questioning domestic paradigms of past and future scenarios

Significant periods of discontinuity and major traumas often generate opportunities for revolution, fostering profound changes reflected in people's behaviors and environments. According to diverse analysis perspectives, the pandemic can be appointed as a creative turning point by approaching vertically the primary meaning of the inhabited space and exploring horizontally the transitional experiences that have opened paths for renewal of the scenarios of use in domestic interiors. In both cases, the extensive literature and some references to the history of domestic interiors offer some supportive elements for the analysis.

2.3.1 Home archetypes and primary meanings

In his *Poetics of Space* book, Bachelard presents the house as the privileged setting for a "phenomenological study of the interior space intimacy" (Bachelard, 1957). This analysis of its manifestations introduces concepts such as *refuge, nest, shell*, and even *corner*, helps to interpret some aspects of the living condition of the contemporary human beings in the pandemic and post-pandemic period.

In fact, the pandemic has led us to experiment with one of the domestic prime values, the significance of refuge as a place in which borders are safeguarded to protect us.

Bachelard talks extensively about how the refuge recalls the primary and primitive action of hugging oneself and hiding, instilling physical well-being in its inhabitant, and how the nest, a temporary dwelling perceived as perennial, represents the origin of "trust in the world".

Particularly interesting, and ontologically different from the previous concepts, is the reference to the corner of a house, linked to the concept of immobility, built around the human body by radiating an imaginary room, a 'germ of the house that is built around our body'.

According to Bachelard (1957):

> For our house is our corner of the world. As has often been said, it is our first universe, a real cosmos [...] The house shelters daydreaming, the house protects the dreamer, [...] is one of the greatest powers of integration for the thoughts, memories and dreams of mankind [...] The meaning refers to a large cradle, a sense of motherhood. (Bachelard, 1957, pp. 4, 6-7).

As mentioned in the previous paragraph, people strongly felt this sense of protection infused by the domestic space during COVID-19 pandemic isolation with the lockdown measures. The impact of this "greatest confinement in history" (Crawford & Crawford, 2021) often caused the so-called 'cabin fever', a mental health fallout of voluntary and involuntary sequestering in people's homes. It was not a medically defined condition, but a 'folk syndrome' defined as a combination of anxiety, lassitude, boredom, depression, or feeling of dissatisfaction.

2.3.2 When the 'city' crosses the domestic boundaries

During the pandemic, staying-at-home conditions required overcoming boundaries by bringing bites of public space with their features and functions – smart working, homeschooling, home fitness, etc. – into the private and domestic one, albeit controlled in time and place. In fact, this sealing of the domestic boundaries has been disturbed several times in history, especially when the dynamism of revolutions has brought new energies that impacted people's behavior in their domestic environment. We can report and analyze case studies that report this interference by the external space and the time flow in the domestic environment by the Futurism Avant-garde, in the first decades of the XX century, and by the Radical Movement, in the Seventies.

The Futurism movement has found its creative energy within the city, interpreted as an expression of the Industrial Revolution progress. In 1915, Balla and Depero presented the *Manifesto for Futurist Reconstruction of the Universe* (Balla & Depero, 1915). The city was the backdrop onto which the dynamism of Futurist life was projected, and the urban development was one of the sources of their inspiration.

They represented the force emerging from the city going beyond the limits of domestic space, including it in this renewal, seeking to foster a total fusion in order to reconstruct the universe, and making it more joyful. They operated at different scales (Sposito, 2017) and they kept the design elements utterly independent from the building architectural structure, in their internal environments, introducing the term 'setting/ambientazione' (Crispolti, 1980). Although they did not directly show technological innovations or changes in their age's formal and aesthetic environment, they offered the profound effects of novelty interiorized in society at that time. Speed, light, and movement, through the fragmentation of actions, represented the time movement and the mutation from the logic of industrial production that characterized their interpretation of reality.

Andrea Branzi, in the introduction to the book *La casa calda* talks about "the institutionalization of the avant-garde as a chamber of traumatic recovery" where design foster a re-foundation activity by tracing "within the dramatic epistemological crisis of modern architecture a point that allowed to recompose a link between man and the system of his objects" (Branzi, 1984).

Like Futurism, the Radical movement corresponds to a period of profound change in society, with the spread of new technologies and mass consumerism. The human being, immersed in this condition, becomes part of a 'global', without external or internal space, where changes occur, reminding a biological process tending to re-shape domestic interiors integrally, in their essence. No-Stop-City, by Archizoom, presents a vision for an immaterial city without quality, an endless metropolis crossed by a continuous flow of information, technical networks, markets, and services, where architecture disappears and residential units are placed over a grid structure, allowing for a large degree of freedom within a repetitive pattern.

Branzi states that due to the weakness of capitalism, the Italian middle-class has therefore never historically expressed its model of home.

This condition has allowed Italian design not to be conditioned by shared models and to redesign the domestic elements from scratch, with an aptitude for radical re-foundation. In some ways, it leads users to rethink the primary meaning of domestic space, to know and

experience firsthand the reasons that over time have defined the distribution and the elements that make up the domestic landscape (Picchi, 2014).

A paradigmatic example is offered by the exhibition titled "Italy: The New Domestic Landscape" at the Museum of Modern Art (MoMA) of New York in 1972 and the Radical Design (from Latin 'root') movement which re-examined the primary meanings of architecture and living space.

Presenting a wide range of conflicting theories, Ambasz says that Italy shows possibilities, limitations and critical problems of contemporary designers (MOMA, 1972).

The need to reflect on the domestic space had been already anticipated by Sottsass in 1966:

> The house has become nothing more than a "packaging" for the gestures of everyday life [...], without myth, the gestures that become used up one after the other in themselves, that arise one out of the other in a process of almost uncontrollable proliferation [...].

This reflection on the contemporary human condition and its home environment during and immediately after the pandemic starts with the home as a refuge, which offers protection and is the favorite place of memory, almost beyond the time that flows. Then it proceeds to report some experimental approaches related to the design of domestic interiors corresponding to changes in the economy and society involving the definition of the house and its ideal and physical boundaries, crossed by the flow of time and space.

In our historical period, this approach fosters rediscovering the primary meanings of our living spaces. It combines them with the urgent requests for performance going beyond the safe borders of our interiors. Is the following Franco La Cecla's (1993) statement still valid:

> Our space, today, in fact, is less and less 'ours'. For a historical process of specialization of functions, it is no longer so easy to 'move', 'change', 'manipulate' the space around us.

2.4 The transition towards new domestic landscapes

The fading of the state of emergency and the end of the lockdown have highlighted the existence of development guidelines for our domestic interiors that move away from a static organization to experiment with hybrid ones, able to fulfill the new needs of contemporary society.

The time we spend in our home has changed and, accordingly, it has become of crucial importance for its spatial organization, which must be able to accommodate new stays, more people, and different activities. Quoting Anna Barbara (2020), the domestic environment goes in the direction of designing:

> Adaptive interiors capable of responding to spatial and temporal needs through forms of self-regulation and compensation: they are spaces designed according to a temporal extension 24/7/365, making themselves available to be composed differently.

In fact, in its various emergency phases between the stay-at-home and the gradual lockdown loosening, the domestic space has undergone some changes in its use and fruition.

According to the literature that is consolidating this domestic experience and the related design activity, the following time-based categories of analysis can be identified in this contribution and explained through explanatory spaces.

a. The 'long' and adaptive time

The prolonged time spent at home allows the inhabitant to rediscover through their own direct experience some intrinsic qualities of some 'kind of spaces' generated or integrated into the architectural shell of their home, as structural parts of the house, 'reviving the forgotten normal' (Peters & Halleran, 2020). Welcoming corners (Bachelard, 1957), windows, entrances have acquired importance and have been empowered and super-exploited, appreciating the primary values of permanence over time and exploring their richness over time.

The specialized literature has highlighted the importance of interrupting the physical boundaries of house borders, their porosity, and the extroverted space going beyond them, such as windows and their thresholds, balconies, and terraces. The spaces surrounding them are progressively rediscovered as privileged areas of quality. Natural light and air regain value during periods of confinement. Visual contact with the outside allows us to place ourselves in time and space to perceive the passing of the seasons, the perception of the passage of daily time, and the circadian rhythm marking human physiology (Peters & Halleran, 2020). Accordingly, (Birer, Esis & Eren, 2021) point out in their research how factors like light levels, a better indoor air quality guaranteed by natural ventilation in the living spaces, the presence of balconies, and adequate unit sizes, could positively affect our health in the domestic space. Moreover, given the importance of the visual relationship with the outside world in an age of confinement, windows could become privileged observation points like telescopes oriented towards the horizon (like Oscar Niemeyer did in Casa das Canoas, Rio de Janeiro 1951-53) or, again, small 'inhabited places', as taught by older architecture – from the hollowed out sockets as seats in medieval castles and Renaissance palaces – up to the numerous experiments of Modernism such as Gio Ponti's 'Finestra arredata' (1956-57).

Together with them, the extroversion of the domestic space, such as balconies and terraces, with their qualities related to self-production of food, and energy self-sufficiency. These pre-existing areas sought-after for their intrinsic quality are exploited for various activities and, consequently, equipped. They provide visual access to nature and a more direct experience of the surroundings (Birer et al., 2021).

b. The 'dense', 'composite' and 'virtual' time

For different use of spaces. The 'dense' time we live in the domestic space is the time of overlapping activities between the different inhabitants of the house. According to a static model, the domestic environment should be organised into rooms, suitable for accommodating different activities, but unable to change.

Looking at the history of interior architecture, in the pre-industrial world, the home was not only a dwelling but also a place of work. With the rise of capitalist society and wage labour, the home began to take on the exclusive role of dwelling, where therefore living is constituted as a 'separate' and valued function (Tosi, 1994). This is where the functional separation between the domestic living sphere (inside the home) and the productive sphere (outside the home) began. It was also during this period that the functional subdivision of rooms became established (Banali, 2015).

Following this model, considering the multitude of activities that nowadays take place in the home, from the most domestic ones to the most linked to the productive sphere, to cite aforementioned references, the domestic environment would have to be articulated in a succession of spaces, increasing the size of our dwellings: an approach that is impractical today, and which would present many problems and constraints. More individual rooms can be conceived, like the ancient monastic habitats, as multifaceted places for rest, exercise, study, or work, but capable of being flexible.

The 'dense' time is thus strongly characterised by a demand for high-performing activity-based settings, activated once needed, and deactivated once it is necessary to perform another activity.

Accordingly, some designers even pave the way to new systems of furniture on rails or on wheels so that we can adapt the rooms to our liking, whether for relaxation, socialising, or work (because the mass smart working mode experienced in those weeks is not destined to end completely with the end of the quarantine). Another theme, linked to the need to create a hybrid space within the home, is that of smart working, distance learning, and online conferences, in which the work and study environment has been superimposed on the domestic one, transforming certain corners of the home into real television sets, where the background has become the main element of communication, acting as a sort of scenography.

A 'virtual time' can be identified in the new relationship between internal and external space, and in the relationship with people outside the home, generating different degrees of privacy, which are now confirmed in contemporary everyday life.

Technology allows us to add a range of activities (work, school, and entertainment), constantly and continuously, to those already provided for in the home. They overlap like an impalpable, light, and reversible layer on the existing domestic physicality. Representing privileged areas of relationship, they also open other types of passageways in domestic intimacy, which lead to a time that flows according to rhythms extraneous to the home, marked differently from the domestic one and a different rhythm for each inhabitant. Thus, everyday living may be a highly technologised space, where people can meet, but also isolate themselves thanks to special furnishings to devote themselves to their private connections, sitting in an armchair with headphones, connected to a PC or other computer devices. Ugo La Pietra, in *La cellula abitativa*, had imagined this in 1972, even though the medium of the time was television.

In conclusion, in contemporary literature, some experiences of domestic life analysis during the pandemic can be traced, to study the use and the production of certain spaces converging and conflicting with others. The need to search for new ways to move the same activities inside the domestic space brings us to experience how 'life fits into room in the new normal' (Birer, Hasgül & Can, 2005; Perec, 1974). According to Bassanelli (2021), contemporary forms of 'existenz minimum' will run through the dwellings, to be reconfigured with light interventions and made-to-measure furnishings that allow the space to be easily modified. One key example of this approach could be the work of Gary Chang in Hong Kong. From 1976 to 2006, he gradually transformed 32 square metres into twenty-four different projects, responding to the changing existential conditions of its inhabitants.

2.5 Designing new forms of living

By examining the behaviours or the new spaces generated by the needs manifested during and after the pandemic, the spread of equipped micro-environments appears to be an emerging approach, which recalls some of the settings above mentioned in relation to the experience of Futurism and Radical movements. Light interventions

as settings, accessory units, or systems independent from the architectural container, which represents the least intrusive and reversible adaptive approach (Stone, 2005; Brooker & Stone, 2004), foster updating the use of domestic spaces, enhancing its potential.

During pandemic times, interior spaces underwent extensive experimentation and manipulation. This phenomenon allowed us to observe how the ephemeral and reversible, but at the same time dense, time layer of the installation combines with the existing domestic space. How it blossoms on it and vanishes, generating micro-environments that come alive with an organic logic, like living organisms. Anna Barbara (2020) discussing the impact of this topic in the study on contemporary interiors, states:

> If the interior design of the twentieth century was dedicated to the forms of space, that century of the twenty-first is exploring the forms of time. These are temporal projects that remodel existing spaces, re-functionalizing them, reinventing them, remodeling them to accommodate other forms of living.

During the pandemic outbreak, the domestic inhabitants often build their settings autonomously, finding the 'ingredients' right at home or on the market and assembling them according to a tactical emergency. Inhabitants, in the shoes of designers, build these settings answering to their own personal needs, highly activity-based, super tailor-made. The results are customized habitats, in which they recognize and communicate their own identity. In fact, the 2021 edition of the IKEA Catalogue, which marks its 70th birthday, will be celebrated, turning its catalog into an inspirational handbook addressed to the different geographical areas, perhaps responding to more specific demands (IKEA, 2020). This approach enables users-inhabitants to become outstanding experts of their inhabited space, as maybe they have never been, made almost self-made and at the same time at the mercy of them, the opposite tendency to this humanization of 'domestic environment', which goes towards alienation (Wiederhold, 2020), a tayloristic rhythm that can generate anxiety and malaise. Nowadays, we can start to evaluate the experience of the pandemic from afar, in a perspective that allows us to assess the breadth and complexity of its impact on the design of domestic interiors. The present discussion aims at soliciting a critical debate to reconnect and relocate the set of

aforementioned settings and their functioning in space-time in relation to the design culture, also considering cultural and historical components able to permeate domestic spaces. Furthermore, it would be desirable to track down new paradigms and new design approaches for the near future domestic living spaces.

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3. Time-based spatial design. Chronotopes as measurements

by Anna Barbara
Department of Design, Politecnico di Milano

Abstract

Spaces are not inanimate volumes fixed in time. When we live in a space, we stay with all the senses and we experience many times, not just the present.

Time must be stimulated, involved, to become tools for designing the spaces, to be part of the experiential performances. We have to learn how to analyze, to map and to design with time, reshaping the forms and writing systems of notation to describe the experiences, the rhythms, the duration of our experience in the spaces. First the digital revolution and then the pandemic, have made it clear that new forms of time – simultaneity, co-presence, slowing down, displacement, extended spaces, etc. – are designing the spaces of physical presence and absence.

The objective of the chapter is to return, to senses and time, the role of key ingredients in the architectural design of places.
The dimensions of architecture are multiple and complex: the known metrical coordinates of the surfaces and volumes; the more complex psychical plans of the mind; the anthropological dimensions of the social experiences; the sensitive quality of the human body.

The involvement of time in spatial design will be managed between the linearity of Cronos and the fluidity of Kairos, but in both cases, we need to design new measurements, chronotopes, to help designers to

answer correctly to the new places. We need a semantic of signs and symbols to represent and express the qualities of time.

Notation is not only an instrument of relief and storytelling, but also the way to start the project, because the construction of sense-time language is the first design choice to involve them in the DNA of the next spaces.

We dwell in time as much as in space, and architecture mediates equally our relationship with this mysterious dimension, giving it its human measure (Pallasmaa, 2016).

3.1 To design forms of time

The relationship between time and space is cardinal in the interpretation and design of spaces. It embodies the historical dimension with place, with communities, with the past and with the future; it expresses the topic of durability and resistance of artifacts to manipulation and wear over time; it is individual and collective memory; it is projection and thus it builds visions and future scenarios; it is phenomenology and tactile perception (Pallasmaa, 2016; Merleau-Ponty, 2003).

What is increasingly evident is that, in recent years, designers and architects have been engaged to design forms of time, much more than forms of space. This has become evident with the digital revolution, but will become even more in the coming years, due to the current pandemic. The relationship between space and time has always concerned fundamental issues in the design of spaces:

- Historical identity.
- Movement.
- Duration and durability.
- Rhythms.
- Nodes.

The identity of a place is rooted in individual and collective history, but it is also the timeline along which the events of one's spatial existence unfold. Movement is one of the cardinal issues, both because it is defined in the relationship between space and time; both because

through it space is measured and the relationships between mobile and fixed entities become dynamic; and because through the phenomenology of speed, acceleration and slowing down, the perception of space is deformed.

Duration is the measure of the time taken, but it is also the length of the life of spaces, of artifacts, of the durability of materials: it is the measure of the segment between the beginning and the end.

Rhythm is the pattern that cadences the periodicity and extraordinariness of the events and activities that take place in spaces. It is a fundamental parameter for grasping the nature of places and the lives they can host. The rhythms can concern the simple opening and closing of activities, but also the natural rhythms of day and night, of holidays and festivities, of seasonality, or the circadian rhythms of the inhabitants (Zardini, 2005).

The node is the meeting in a precise point of space at an exact instant, between people and things in motion. These nodes are the focal points of time-based space design and are the most strategic places in contemporary places. They are points of exchange, of intersection, of intermodality, of passage of state and speed that contribute to the vitality and management and design of spaces. In the nodes we measure presence, absence, but also co-presence, crowding or emptiness (Lynch, 1964, 1977).

3.2 Shaping time

What, then, is time?
When no one asks me, I know,
but if someone asks me and I want to explain it to him, I don't know.
Saint Augustine, XI Book of Confessions

There are countless attempts to explain time, often using metaphors, which have been the fundamental means of trying to represent it.

The theme of "giving shape to time", has been the subject of reflections of the greatest thinkers. Saint Augustine who could not answer, Immanuel Kant for whom time could not be visualized because it is the form of our inner intuition and therefore lacks visible

contours; Aristotle and Kant for whom time was point and line; Hegel and Nietzsche for whom time was circle; while it was cone and pyramid for Bergson; net for Merleau-Ponty; gift for Heidegger; crystal and fold for Deleuze; labyrinth for Borges, Chinese roof for Francois Jullien (Birnbaum, 2007).

Different ideas of time corresponded to different geometric representations. The most common, however, remain the line (timeline), which follows a regular course used to tell the story and its events as a sequence, and the circle/spiral connected to the seasonality and cyclicity of recurring events. This one-way form, almost didactic, sometimes lacking in complexity, was the form of time in twentieth-century space, which was also industrial and productive, designed by the industrial idea to reduce waste and optimize distances and movements. Thus projects, such as Margarete Schütte-Lihotzky's Frankfurt kitchen, became as efficient as the command cabins of air force planes (Bassanini, 2008).

The idea of linear space-time is the one that was adopted with narrative intentions, as a visualization of trajectories of continuity that from Cubism to contemporary architecture, accompanied the history of architecture and interiors of the twentieth century (Giedion, 1967).

3.3 When do buildings expire?

The relationship with time expressed by great contemporary urban architecture reproduces, inverting it, the relationship with time expressed by the spectacle of ruins. The ruins accumulate too much history. What they present to our gaze is not history. They do not tell us history, but time, pure time (Augé, 2009).

Time is also duration, entropy in which everything that is built, everything that lives, is transformed. Spaces are inexorably conceived by designers through the lens of their time of existence and end. It is this presence of time that arranges the composition of spaces, the sequence between them, the connection, but also the choice of materials that build it, their resistance, and their value.

The western monotheistic, with its idea of an afterlife, has programmed the time of artifacts and buildings along a linear time, with a beginning and an end, while the eastern polytheistic has based

the construction of its buildings on the idea of a cyclic time, where artifacts are transformed into an endless repetition.

Think of the millennial nature of the cathedral and the ephemeral nature of the Shinto temple that every twenty years is demolished and completely rebuilt, changing both the external structure and the interior (Barbara, 2011) and you understand that the theme of materials is not purely aesthetic, technological, or constructive, but also symbolic and temporal.

It is an existential theme related to the relationship between a society and its idea of death, but also a thanatological issue, dealing with the subsequent transformations of buildings beyond their presumed end.

Jill Stoner, Professor of Architecture at Berkeley, has attempted a cataloguing of buildings with respect to the design possibilities that arise beyond their expiration date:

- **Abandonment**, referring to the sense of functional and semantic end that invests some places that remain as a sign of a "natural" death of architecture, becoming ruins and thus taking on symbolic value.
- **Demolition**, referring to an idea of a building that expires, that ends, and that is destroyed at the end of its functional mandate, as happened for buildings such as the Pruitt-Igoe complex in 1972, which was among the most famous cases of a building's proclaimed end, but also of a promise.
- **Deconstruction**, that allows buildings to be completely disassembled and rebuilt, as in the radical dreams of the architects of the 1970s, recovering most of the materials and architectural components.
- **Preservation**, conservation, restoration that works on the stratification of the new in superimposition on the existing and on history.
- **Renovation**, and rehabilitation in which we "restart the clock" using the shell of the existing building but destining it to a new life.
- **Adaptive**, where a reuse of the building not connected at all with the previous functions and destinations is pursued.
- **Reoccupation**, when a building lives in the "meantime", that is, it occupies a temporal band between the previous life and a new one

with projects of ephemeral nature, such as the project of Location et Vassal for Palais de Tokyo, which is also a project of "meantime", that is, of temporal occupation between a previous life and a new one yet undefined (Barbara, 2012).

- **Pure expression**, when the time of places is employed by artists as an ingredient of their works as for Matta Clark and Rachel Whiteread, but also dust in the works of many artists starting from Duchamp.
- **Resurrection**, when a project reclaims the memory of an existing building, as in the case of the memorial for the Twin Towers.

Buildings and spaces are designed to live in time and for this reason the temporal dimension is never exempt from the designer's thinking, both as a projection into the future and as a practice of transformation (Stoner, 2016).

3.4 The observer in motion

Architecture until the nineteenth century worked on the static nature of the relationship between observer and place, although there had already been attempts, during the Baroque, to design places whose formal matrix stemmed from the movement of the observer. But this dynamism assumed, at the end of the nineteenth century, the identity of the flaneur, who did not limit himself to observing the fixity of space during his walk in the Parisian *passages* as Walter Benjamin described but wanted to experience the movement of the same space through the cinematic eye of Siegfried Kracauer, that formed and deformed the scenic and urban space.

The cinema, but also futurist art, sensed that speed would be the great designer of the spaces of modernity, in which Cartesian plans would no longer be sufficient to contain the excitement of acceleration and time would be an unstoppable race towards the future.

The avant-garde explored, in that century, the potential of the phenomenology of time on the perception of space and left to the following generations the best experiments in art, architecture, design, theater and cinema. The timeline was not only used to measure time but became the narrative path along which to move the camera of the observer-director.

Modern architecture was fascinated by the movement, even when the enthusiasm for speed was cooled by two world wars. Proof of this are the architectural promenades of Le Corbusier, such as the famous one in the Villa Savoye, or the double spiral of F.L. Wright in the Guggenheim Museum in New York. The experience of movement in space became the main narrative of the space itself, in a succession of poetic frames.

Other avant-gardes explored the kinematic dimension of space, such as the Gruppo T (T meant time) which explored the dynamism of the observer, but also of space and its devices, to fully involve the senses of those present.

They are the works by Gianni Colombo, Topoestesia, Spazio Elastico, the space-time dilation of Grazia Varisco's paths and Davide Boriani's Chronostatic Environment, in which Euclidean space actually seems to deform into new temporal and perceptive coordinates.

3.5 Time as capital

Among the accusations against the merchants, figure prominently the reproach that their profit presupposes a mortgage on time which belongs to God alone (Jacques Le Goff).

Postmodern philosophers David Harvey and Fredric Jameson identified the existence of two seemingly opposite phenomena: the temporalization of space (changing spatial dimensions in experiences and temporal units) and the spatialization of time (Harvey, 2000).

The combination of technology and speed turned out to be dangerous because it created an instability capable of devouring space and time and leaving humans at the mercy of incompleteness, but above all short of memory (Virilio, 2000).

"Do not waste time" became the *dictat* of twentieth-century capitalism and its culture, which was reflected in the search for the efficiency of the infrastructure of mobility and productivity. Duration therefore became a parameter to be monitored, in favor of speed and efficiency, of the ephemeral.

The "time-saving" as a measure of innovation, counted however on the efficiency of space infrastructures of the last millennium, has produced economic imbalances, social, political, and productive paradoxes in every sector. From places of entertainment to hospitality, from tourism to retail, all have sought to shorten the distance between pleasure and supply, selling experiences and places *à la carte* (Gwiazdzinski, 2003) that compress or expand temporal coordinates to reshape distances and simulate proximity (Virilio, 2000).

The temporal manipulation, functional to the market, transformed the inhabitants into consumers, conveying an idea that the physiological nature of our body was an obstacle to innovation and that it had to train to the needs of a globalized world, at all costs.

The circadian rhythms induced by day and night, as well as the sequence of weeks and seasons, became too limiting temporal boundaries for spaces capable of being 24/7 open.

In this vertigo, bodies and places have tried to adapt, to stress themselves to reach the required performances with often unsustainable and paradoxical results.

But the value of acceleration, and the consequent excitement, was not exclusively positive. The writer Milan Kundera associated with it the loss of memory in proportion to the speed. The end of the twentieth century, and of the fast and tireless city, was decreed by a promotion of slowness, of awareness, of the shared experience of places, but also of serendipity (Sennett, 2016).

Only a conscious design, of the various forms of time, recognizes the potential, not only in the exploitation, but also in the capacity of the slow forms of time to give birth to community, meeting possibilities, construction of the relationship between people (inhabitants, users, citizens), of presence, proximity and distance.

In the reconciliation between time and space, we can redesign a design bet of the current millennium: analogical time, digital time, but also *phygital* time in the interweaving between the first two (Floridi, 2009).

Fig. 18 - Buildings are like clocks. Chronotopes designed by Gnocchi, Frusca.

3.6 Digitalization and fragmentation of time

The city of men becomes fluid so much so that the built city is a caravanserai that hosts like a skin, an extended flows in transit that combine and meet for the space of time for the space of time insufficient to decree a new identity of the place (Bonfiglioli, 1990).

Just as the technologies of the 20th century were technologies of speed, of acceleration, those of the 21st century are leading to other dizzying movements, to a bending of spaces due to co-presence, ubiquity, overlapping, increasing congestion of spaces and peaks of stress in infrastructures and spaces.

When it was introduced the concept of 'liquid modernity', it initiated a profound reflection on the spatial-temporal morphology of places, relationships, and technologies, which is still ongoing. From that moment on, designing spaces could no longer be the same as before, because the fluidity of time also reshaped space. Spaces were no longer the frame, the set of reference, of human actions, but became one of the possible media able to allow adaptability and flexibility, in a continuous flow of changes, characterized by an endemic uncertainty (Bauman, 2007).

The digital age has led to the implosion of the time horizon and the proliferation of forms of time, to the ubiquitous (Pallasmaa, 2016). Today we live in a multi-temporal connection, in a continuous and "liquid" flow, we simultaneously inhabit different temporal zones, in a kind of hetero chronology that has become the condition of normality (Groys, 2018).

Digitization has transformed time into a dusting of moments, long "each of which proceeds according to its own direction and immediately disappears" as Italo Calvino wrote.

Thus, the continuity of the narrative is fragmented, hypertextual connections of spaces in different times are created, the framework of human relationships is no longer anachronic, but becomes synchronic to ensure coincidence of information and circulation (Choay, 2003).

As time multiplies, transforms, and empowers, on the contrary, there is a sense of inadequacy of the real estate market and the real spaces in which we live. They are static spaces, unsuitable for the new forms of living that the revolution of technologies now allows (Carpo, 2017). They are the technologies of:

- **Mobility**, which distorts the perception of space and time.
- **Communication**, which redefines the interaction between chronemics and proxemics.
- **Sharing**, which promotes flexibility, transformability, and availability of space (Gausa, 2010).

Media have become indispensable tools for creating a sense of closeness at a distance, aided by simultaneous, non-deferred interaction. Asynchronous media have a lower degree of engagement than sharing media, of the experience embedded in the space of places (Castells, 1989).

Through this "connected presence," all the places we pass through are imbued with a sense of intimacy, but also a sense of separation from context and absence (Perry, 2001). Media communication does not make us free of spaces, places, and practices, but it does make them available to other networkers.

Places and moments of disconnection are increasingly rare: everything you can do online is open 24/7 (Barbara, 2012). Private space seems to become more open and global as the public becomes more intimate and local (Augé, 2009).
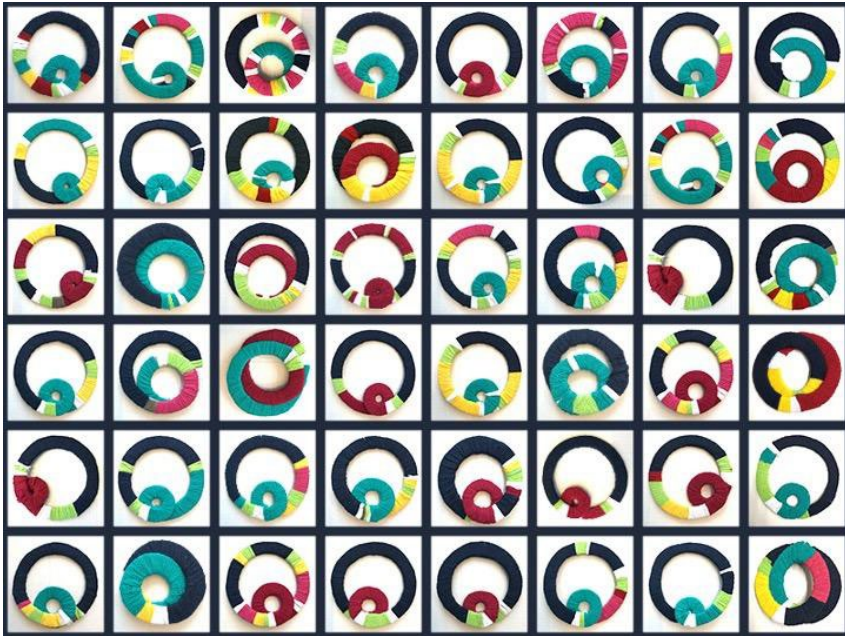
Fig. 19 - Circadian Chronotope. This is an exercise that I propose to my students, to build a double spiral chronotope where one circle is the day, and one is the night ... and the color indicates where they are. You can quickly see that even a distinction that everyone might agree on – where night begins and where it ends – finds a homogeneous group of students in their 20s with completely different answers. Some consider night to be the time when they go to sleep; others when they close the door to their room and enter their digital world; others when the sun goes down... this shows that even the cyclical time of a day and the simple definition of the difference between day and night is by no means obvious. If we add to this analysis the digital life, which complements the real one, we can deduce that a student could be physically in Milan but continue to live (digitally) in Beijing and vice versa. Designed by the Students of Ephemeral Lab, Politecnico di Milano, a.a. 2018-2019

3.7 To warp the space

The world of hypervelocity, of hyper connection, has become a congested world, where events happen concentrated in the same focal points, creating congestion and crowding; where networks connect a system of discrete points, with a high attraction quotient, while the rest of the world, the periphery, the other places are inexorably distanced, excluded, marginalized.

In 1992, the philosopher David Harvey predicted that the compression of time would have a destructive impact on societies, would make Cartesian space lose its sense of depth, tactility, and plasticity in favor of other morphologies. The end of Cartesian space and the birth of compressed and elongated spaces that would have redrawn geographies, completely modified with respect to those, we had known until then, had been announced. In these new spaces, distances would have been measured by time and distances between places, cities, would have moved closer and further away according to the speed of the transport and connection infrastructures that innervated those territories. The warped space of the third millennium is one in which proximity is established by economic logic, digital connections, infrastructural systems and not by the metric measurement of space between nodes, people and spaces. In time-based spaces, distances are temporal and not spatial, maps are isochronous, they are anamorphic (Ling & Campbell, 2009).
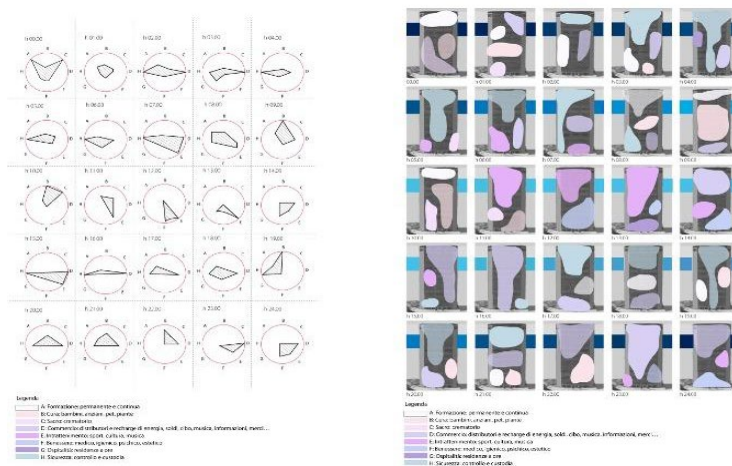

Fig. 20 - ON-OFF Chronotopes. The most frequent chronotopes indicate the use of a space as an ON function and as OFF when there are no activities. This type of chronotope gives information on the possibility of providing other functions in the unused times of spaces, but also offers indications on the sizing and energy consumption of spaces. The chronotopes in this image refer to the Cronos and Kairos project, exhibited at the Venice Architecture Biennial in 2010, in which new functions were experimented inside the Pirelli skyscraper in Milan, in spaces that were momentarily empty. The aim was to make the skyscraper active 24/7, without significantly modifying the spaces. Designed by Anna Barbara

3.8 To flat the peaks

The spaces of the twentieth-century city were sized according to a single time, which equally measured the spaces and lives of everyone. Those who did not adhere to that time were excluded, outsiders who were viewed with moral suspicion, because their asynchrony could have jammed the great social clock.

But that unique and exclusive time cannot stand complexity, it produces maximum crowding, congestion and ends up being unproductive and generating emptiness and waste.

Designing time concerns the dimensioning of spaces and infrastructures, that suffer from congestion due to "crowding peaks". At nine in the morning, commuters clog the roads, causing traffic jams and accidents. The same happens at lunchtime or on the way home in the evening.

Urban infrastructures, predominantly effect of a 20th century culture, suffer from peaks of crowding, and with the pandemic and lockdowns, we've come to understand the senselessness of a single, Fordist time.

Work flexibility – which we tested in the months of COVID-19 – presents us with a unique opportunity: that of rescheduling and reconciling our schedules to avoid overloading the city's infrastructure. In recent months, many people have begun to move in a staggered fashion, going to the office at alternate days and times. In addition to reducing the risk of contagion, this practice allows us to better distribute traffic flows.

The 21st century architecture must not only design new buildings but must increase the capacity and flexibility of those that exist, promoting sharing, shifting, digitization.

The policy of public and private spaces must allow the flattening of the crowding curve, the reduction of peaks in favor of the dilution of flows and a better distribution of densities. If we transfer this logic to our residences or offices, it will become obvious to radically rethink the organization of the spaces where we live, for reasons of cost, but also of sustainability. Time-based spaces will be more and more like temporal gears, which we will ask to synchronize the temporalities of the activities and communities present, following their desires and needs. We can no longer afford monofunctional buildings, empty or

turned off when closed, but potentially available for other activities. Buildings must be designed to be adaptable over time because even when closed, they have an energy, social and economic cost. A school that is empty at night, or a train station that is deserted 90% of the time, or a stadium that is only open for games on weekends, are unsustainable forms of waste.
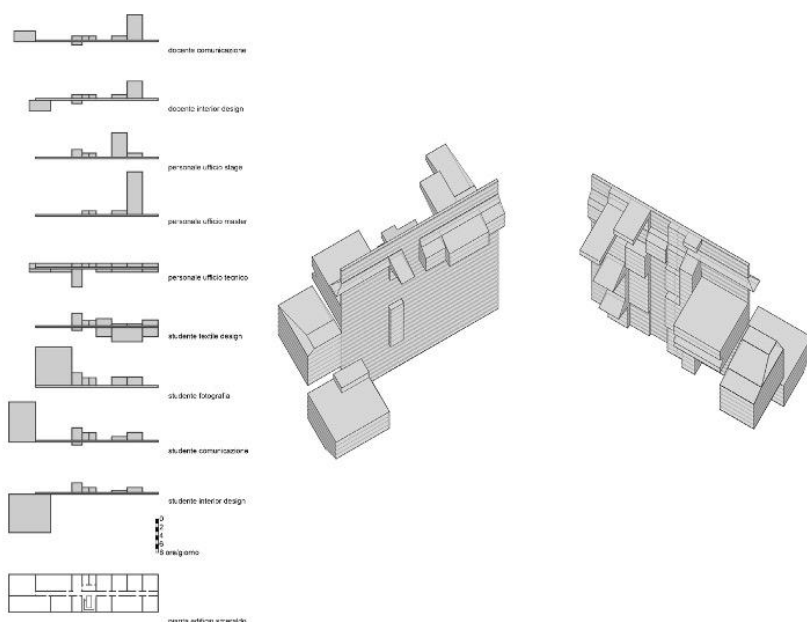

Fig. 21 - Temporal Axonometry. In the temporal axonometry, we demonstrate what the proper sizing of a school should be by sizing the spaces according to their actual use. An interesting indication that emerges is that, for example, many spaces could accommodate many more functions by simply staggering the schedules. Such information should be provided to designers as a design brief, to think about all the possible lives of the spaces being designed and consequently make decisions that can make different activities compatible. Designed by Luca Poncellini

3.9 Time-based design

The definition of time-based design comes from research by Leupen, Heijine, and van Zwol in 2005, in which they began to investigate how the design of spaces would involve time. Leupen

recognized that the speed of modernization and the unpredictability inherent in technological processes, made it very difficult for buildings to respond appropriately.

While Leupen began to investigate the potential offered by temporal flexibility in conditions of lack of space, van Zwol realized that in the meantime the relationship between work and living had also changed and investigated the potential functional hybridizations and overlaps, considering the possibility of designing spaces without specific functions (Leupen, Heijne & Van Zwol, 2005).

Their research was cardinal, because it emphasized the urgency of including the temporal dimension already in the genesis of spaces and not only at the end of the design, as an exclusive management of spaces. What emerged from their studies was that a space that is designed by already foreseeing its potential destinations and its transformations not only over the years, but also over different times and days, is a space with exceptional potential both for those who live in it, for those who design it, and for those who invest in it.

The results they arrived at were aimed at:

- Transform the mono-functionality of spaces, introducing the need to design spaces that are versatile in form and time.
- Introduce the personalization of spaces.
- Rethink the performance of components.
- Introducing new rhythms in spaces.
- Change the size/shape of each space according to changing needs.
- Change the sense of privacy.
- Etc.

From these paradigm shifts in the design of spaces; entire strands of research and experimentation were born. The utopias of Radical architecture, which believed that the temporal dimension would transform buildings into living machines, vehicles on an architectural scale, adaptable to different inhabitants and contexts, in a dynamic relationship between people and places (e.g., Walking City by Archigram, Generator Project by Cedric Price and John Frazer), were the most visionary.

The masters of the caliber of Peter Eisenman, Greg Lynn, Kas Oosterhuis and Marcos Novak who approached the theme with the optimism and enthusiasm of the beginning of the digital revolution,

understanding time as the possibility of modifying spaces through parametric design, robotics, etc. in a constructive and performative dynamic.

And finally, all those who sought to design temporal transformations of traditional spaces through dynamic qualities of structures, volumes, and subsystems. As in Gary Chang's Domestic Transformer in Hong Kong, in which a spinal wall at the center flows from one side to the other compressing spaces according to the presence and need of the individual inhabitant of the house. Or Origami, designed by Michael Janzen; Greg Lynn's Embryologic House; or Transformer, the temporary pavilion designed by OMA in Seoul, which is rotated on its sides to become a theater, a place for fashion shows or an exhibition hall.

"Smart" technologies were supposed to reshape spaces, interiors, architecture, buildings, and infrastructure according to needs, desires, and environmental conditions, as well as personalize the experience (Carpo, 2017). However, we are still in a phase of speculation and experimentation, which has not yet had any significant impact on the daily reality of the spaces we inhabit.

3.9.1 Chronemics

Another discipline that has dealt with time in spaces is Chronemics – often combined with proxemics – which analyzes relationships with time in its various manifestations. Chronemics shows the personal, social, and cultural qualities of designing with time, and is based on the principle that the failure of synchronicity, causes dystonia, misunderstandings, discomfort (Zucchermaglio, 2013).

Mobile media have increased spatiotemporal flexibility in social interactions. Time and space have amplified degrees of freedom requiring greater flexibility, negotiation, and reconstruction of roles and rules in both private and public settings.

It is a negotiation based on a subjective sense of space and time that, to ensure the process of interaction, requires maximum involvement and identification. The greater the inclusion and involvement, the better the interaction. The context, the space in which

the body is physically present, becomes the background and not the stage of the action (Light, 2006).

In this sense, the time-based space, configured by the new media, replaces, or adds new possibilities for relationships, but above all intensifies the social presence, with all that follows and makes many activities shareable. When we are connected, we experience a co-presence because, in Heideggerian terms, the physical space – in which we find ourselves – is juxtaposed to the phenomenological one.

3.9.2 Chronotopes

The representation of the forms of time, and the systems of notation, become therefore strategic to detect, analyze, but also to design time-based spaces. The literature proposes chronotopes, to be understood as the concept that names the temporal characters of a place: times of the processes of historical construction; temporal structures of the presences of populations; schedules and calendars of services; temporal structure of mobility flows (Zedda, 2010).

Chronotopes also refer to the different declinations of temporality: temporal distances, times and calendars of activities, services, mobility, the age of the people who inhabit places, their rhythms, their modes and intensity of presence and use of spaces, the potential of places, historical stratifications (Drevon, Gwiazdzinski & Klein, 2017).
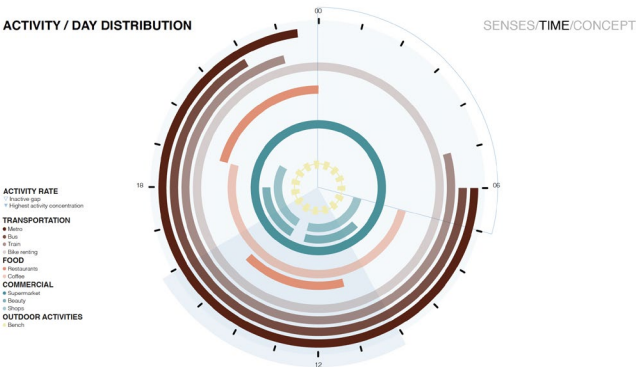
Chronotopes are a tool for drawing time by attributing to it a physical, spatial dimension, to represent it with the same techniques used to draw space. In general, the size of the spaces in which we live, work, study, etc. is proportional to the function and the amount of people that need to be accommodated. What if it also depended on the amount of time spent there? The chronotopes represent attempts to represent the spaces of a building as a function of the expected length of stay for each individual guest. They are a visualization system that makes it possible to make immediately visible the need for services and equipment (power of the air conditioning system, power of the wi-fi signal, etc.) in the different areas of a building.

Depending on the idea of time, chronotopes take on different geometries: *linear*, which is often the way in which chronology is

represented, as a sequence on a timeline; *circular* linked to the seasonality and cyclicity of small recurring events, but also *parametric*, capable of representing the dynamic deformations of space over time. There may be various chronotopes according on the purpose of the time analysis:
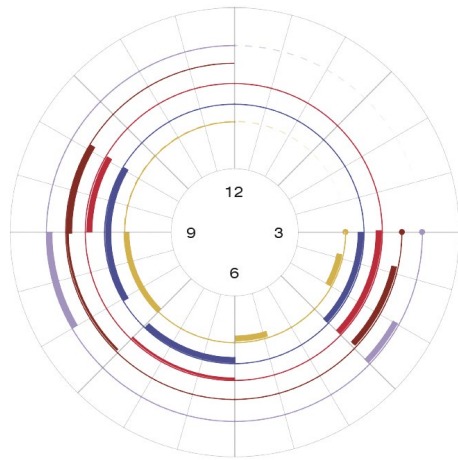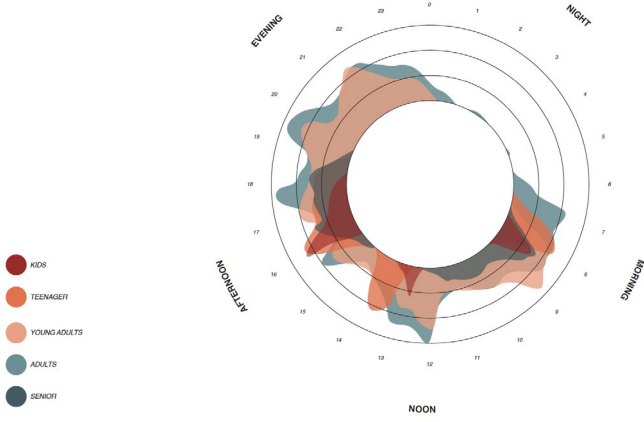
- The opening and closing (on-off) of locations with respect to planned activities.
- The stratification through levels that show the change of a situation in time.
- The deformation generated by stress in "fleet the peak" conditions.
- The sequencing of a transformation through sequential or time-lapse images that, viewed together, show the change in progress.
- The porosity of a space or an area inside a compensation system able to absorb the transformations without changing its aspect.
- The dynamism that allows the spatial representation of phenomena marked in time.

Citizens share the same spaces but with different temporalities. (Drevon, Gwiazdzinski & Klein, 2017). For this reason, through the temporal study enabled by chronotopes, it emerges that cities are filled with emptied spaces that have fulfilled their function and are only momentarily empty. Precisely these temporal voids offer an extraordinary potential that a coordinated planning could make available for other activities. It would be a kind of circularity, which employs the voids as areas of compensation, of flexibility in space and time (Sennett, 2018).
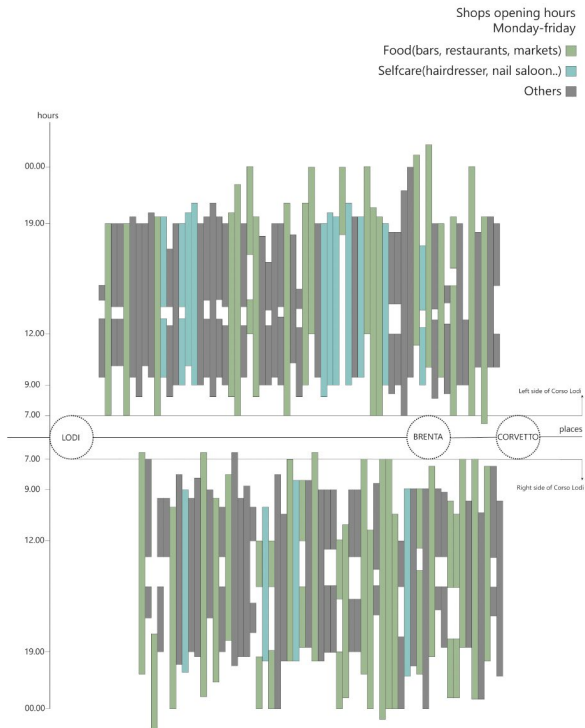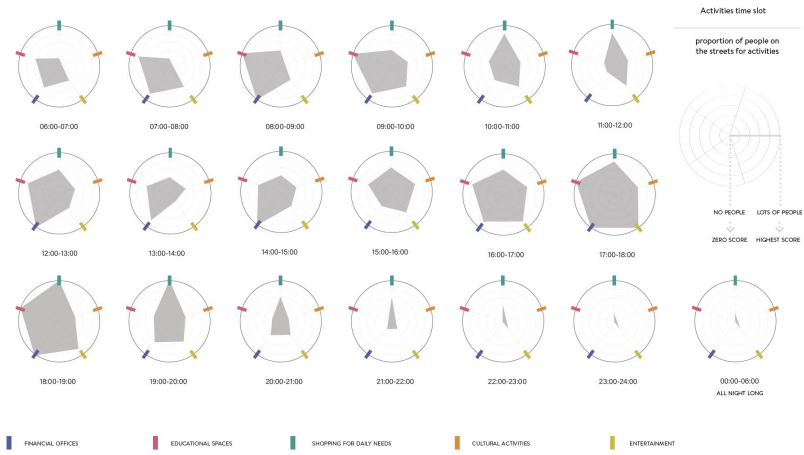
CHRONOTOPE

Activities time slot

proportion of people on the streets for activities

06:00-07:00   07:00-08:00   08:00-09:00   09:00-10:00   10:00-11:00   11:00-12:00

12:00-13:00   13:00-14:00   14:00-15:00   15:00-16:00   16:00-17:00   17:00-18:00

18:00-19:00   19:00-20:00   20:00-21:00   21:00-22:00   22:00-23:00   23:00-24:00   00:00-06:00 ALL NIGHT LONG

NO PEOPLE   LOTS OF PEOPLE

ZERO SCORE   HIGHEST SCORE

FINANCIAL OFFICES   EDUCATIONAL SPACES   SHOPPING FOR DAILY NEEDS   CULTURAL ACTIVITIES   ENTERTAINMENT

Shops opening hours
Monday-friday

Food(bars, restaurants, markets)
Selfcare(hairdresser, nail saloon..)
Others

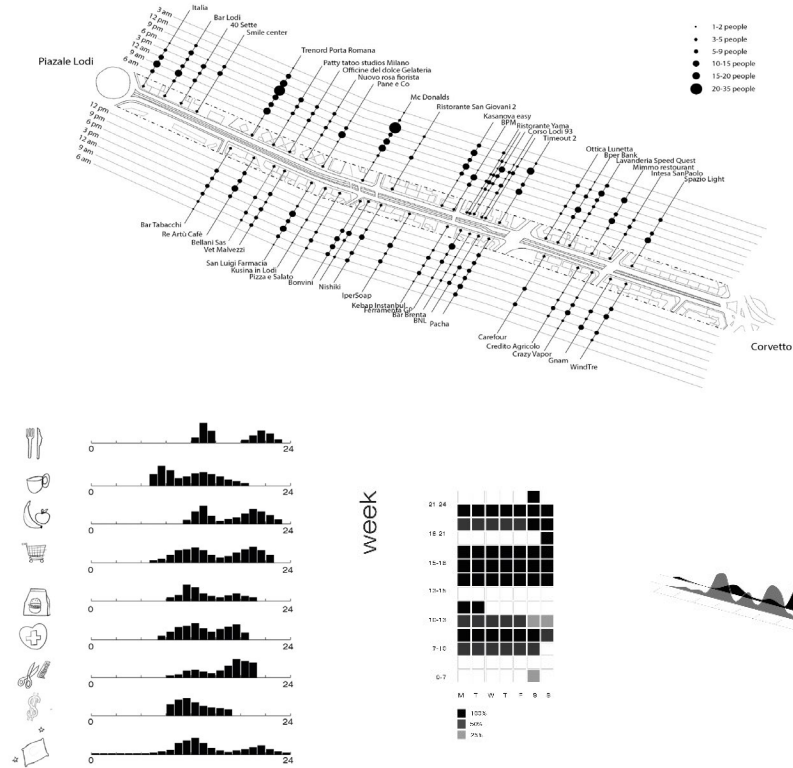

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ACTIVITE'S CLIENTS TIMELINE

Fig. 22 - All the above images are Chronotopes. The social nature of time chronotopes as project tools. Chronotopes, besides being a tool for analysis, can also play a role of projection, of project, of sharing able to tell the potentialities of some project scenarios according to times, users, activities and services and the compatibility between them. Chronotopes build maps of movements, speeds and slowdowns, maps of services and times of different communities. Through chronotopes we try to understand when street furniture and bike lanes, benches are used, but also how they are used and by whom, to design a possible, different configuration making the space more welcoming and inclusive. The same chronotopes were used to reconcile the times of residents with those of visitors, workers, and users. Finally, through the chronotopes it is possible to formulate proposals for time-based design able to use less space, not requiring the construction of additional buildings, but a better use of time than those that already exist. Designed by the students of the Ephemeral Lab, Politecnico di Milano, a.a. 2021-2022. Designed by: Giuliana Burga, Viviana Galloni, Alejandra Gonzalez, Emma Torreggiani, Luisa Uscategui, Ciliberti Elisa, Drakonaki Angeliki, Kalachev Krastio, Osman Alaa Faisal, Wynants Maxim, Yuhsuan Lin, Alessandra Alocarni, Andrea Cavallier, Mahafarid Kazemi, Pegah Khazaeli, Vittoria Romanian, Elisa Arrigoni, Fang Shuyi, Nan Jiang, Stefano Garagiola, Valerio Morgante, Yuhan Wen, Ilaria Allioli, Valentina Steffenoni, Grazia Tonoletti, Xiaowei Zeng, Paula Abdelmalek

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3.10 Can we use CHRONOTOPES for the future studies?

It is evident that we can no longer speak of a single time, but of temporalities that move at different speeds and on different planes. The present alternative, as well as the possible, desirable, probable futures, etc., of a territory or an economy or a country do not move in sync with each other. The future of one area of the planet may coincide with the near past of another, or our present coincides with the desirable future of that of another country. Our future may yet happen, or perhaps somewhere it has already happened.

And in this very idea, chronotopes could be tools for future studies that, as it happens in the cinematographic fiction, can draw a multi-chronemic narration, moving along several parallel or intertwined stories, creative sequences, and developments, able to bend time and space according to geometries useful to the plot.

Designing the forms of TIME must not mean designing speed, but it will also have to mean designing rhythm (Lynch, 1977) and designing slowness (Sennett, 2018). It will not have to mean designing only the future of an elite. The competitive time we have experienced so far has a divergent future, that we can no longer sustain.

We will have to design times to reconcile work and living, care and education, and different cultures and generations (Bonfiglioli, 1990); we will have to design times to slow down and become more aware of the spaces and places we inhabit and traverse (Sennett, 2018); we should design times to possibly decrease or take backward paths perhaps (Latouche, 2014); to be collaborative with neighboring communities and reconstitute short networks between people and places (Manzini, 2021); we will need to be inclusive in the future, able to bring together innovation and sustainable development so that it is accessible to most people.

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4. Rethinking temporalities in design through literature

by Susan Yelavich
Parsons School of Design

Abstract

Where design projects possibilities, literature activates their potential. This is evident in an unstudied genre of novels, poems, and essays, which give voice to objects and spaces and the force fields that bind and break them. These narratives offer a way of thinking about design that doesn't segregate the instrumental and the theoretical. Instead, such works synthesize the quotidian and the poetic yielding a wider tributary in the thought of things and places. In this paper, the spheres of design's multifarious entanglements will be examined within the temporalities of design itself. The effects of design and designing will be considered within three broad understandings of time: as deep, as immediate, as yet-to-be. Needless to say, these temporalities are as artificial the systems we have contrived to measure time. Moreover, these three frameworks are porous. This paper – written from a design studies perspective that draws on semiotic and textual analysis – is meant to be viewed as much as a literary exercise as the source material that informs it.

4.1 The value of literature to design

Design, in its ubiquity, invites taxonomies. This paper presumes to offer another. It considers design through the lens of time. It doesn't

discount other factors such as culture, politics, and technology, which the author has dealt with elsewhere. Rather it offers another lens through which to view the multivalent nature of design. For example, a phone can be understood as a technological extension of the senses, and it can also be understood to have the properties and values of temporal immediacy. Literature is especially useful in amplifying one or more of these characteristics. Here I deploy it as a method of design research, drawing on excerpts from novels, essays, and poems in which things and places are protagonists. And in keeping with design studies pursuit of theory (here, literature) through practice, the paper will be punctuated with works of contemporary design as double reading of the matter at hand.

The overarching ambition of this chapter is to open up ways for designers, design students, design scholars, and general readers to think of design as the configuration of things and places that set up conditions for alternate plot lines, and not as an end in and of itself.

Literature offers a rich a compendium of scenarios in which those things and places act. The fact that those things (two- and three-dimensional objects, systems) and places (streets, rooms, cities, buildings) are rarely, if ever, described as 'design' in literature is especially germane to the ambition of my project. That is, to locate design in between particular characteristics of objects and spaces and the generic ideas they enact.

We see this synthesis of the specific and the poetic in Ivo Andrić's novel *The Bridge on the Drina* (1977), when he describes the inherent and the social character of the bridge of the book's title:

> A man was then as if in a magic swing; he swung over the earth and the waters and flew in the skies, yet was firmly and surely linked with the town and his own white house there on the bank with its plum orchard about it (pp. 14-15).

Yet it is always only *this* historic bridge[1] that encourages cultural cosmopolitanism with its *kapia* – a swelling in the middle of its span with a s*ofa* where people of different persuasions have met and talked

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1. The plot of Andrić's novel *The Bridge on the Drina* centers on an actual bridge in Bosnia designed by the Turkish architect Mimar Sinan, perhaps best known as the designer of the Süleymaniye Mosque in Istanbul.

for centuries. It is both in time and out of time. As is the contemporary bridge below in Sarajevo with its vertical *kapia* with a bench inside inviting both a pause in an otherwise linear span and an interruption of linear time.

Fig. 23 - Festina Lente, Adnan Alagić, Bojan Kanlić, and Amila Hrustić, 2007-2012.

Andric and authors like him thus expand design by repositioning it the space-time of language. In short, they show us the nature and ramifications of things and places that we've lost sight of simply because we see them all the time (Yelavich, 2019).

Drawing on literature for such insights demands what literary critic George Steiner calls "a politics of the primary" (Steiner, 1989). One that demands van openness to an author's way of presenting a work (and implicitly a world view), and abstention from critique until the work is fully ingested, and not merely digested. Steiner argues for a performative criticism, which, in this context, entails focusing intently on an author's words for their own qualities instead relying on secondary and tertiary exegeses. By the 'qualities' of words, I mean

their resonance, cadence, sequencing, adjacencies, and etymology, all of which converge in meaning.

Steiner's commitment a close reading of an author's words, however criticized in literary circles as deaf to divergent readings, is striking for its parallels with that of close observation. One of the challenges of design education is creating conditions in which students can lift the veil of preconception. (As happens, when, for example, a presumption about the needs of refugees, or any given population, occludes more appropriate design responses). Of course, close reading and close observation do not preclude bias on the part of designers, nor is it a guarantee of how design will be received and changed by choice or accident. But close reading and close observation do offer opportunities to think design differently, which, in and of itself, takes time, something the economies that support design rarely permit.

4.2 Three temporalities of design

Design's relation to time has been discussed in terms of patina and the social value it confers (Appadurai, 1997); as a matter of durability and environmental sustainability (Verbeek, 2005); and in terms of the simultaneous realms of the digital as it affects spatial design (Barbara, 2014). What this paper seeks to add to this abbreviated list of perspectives is a study of how the perception and experience of time is designed in and by artifactual narratives made visceral by literature.

The texts and projects that I will discuss deal with the dialectic between subjective and objective time. Through the selection of excerpts that follows, I hope to draw out insights into how design alters temporality in different circumstances, provoking reevaluations of our relationships to human and non-human actors. By creating ruptures in the present – either by animating aspects of the past or proposing future possibilities – design and literature lift us out of the everyday, and, if only momentarily, shift our positions in time and space, enabling us to question the world as we find it.

4.2.1 Deep time

How is it possible that design can make the past present? Self-conscious attempts such as commemoratives, memorials, grave markers, historic preservation, and plaques tend to have the opposite effect. They put the past in a frame and pre-edit our associations with it by explaining what happened and when. It may be the case that unadulterated things and places, which were once designed, transmit the deepest sense of time-in-the-past. Admittedly, designers cannot fashion a temporal experience because they can't access the state of mind of everyone who might come across their work. Nonetheless, associative triggers lie dormant in the configurations, contexts, and materiality of the myriad things and places we encounter – some more than others, depending on their notoriety.

W.G. Sebald delves into this phenomenological dimension of design in his 2001 novel *Austerlitz*. In it, he takes his reader on a journey in which temporalities collide in train stations, villages, and fortresses. The protagonist, the eponymous Jacques Austerlitz, is an architectural historian, who sets off in 1967 to discover the fate of his Jewish parents and in doing so to understand his own history and the recurring sensations he's never fully understood. Sebald's is an essay in the uncanny, which appropriately, in German means *das Unheimliche*: unhomely or unsettled (Vidler, 1992). In fact, the protagonist's origin story begins with his removal from his home in Prague. At the age of four he had boarded one of the *kindertransport* that rescued Jewish children from Nazi German-controlled territories. As the story proceeds, Austerlitz discovers that his mother was taken to a concentration camp in the Czech town of Terezín (renamed Theresienstadt by the Germans). It is the town itself, which he finds disquieting.

He notes there are only two shops, one of which, strangely enough, given the town's history, is an antique store. …In the muteness of the shuttered village that turns a blind eye to his gaze, we sense, with Austerlitz, the politics of denial, a perceptible aesthetic of denial (Bell, 2001, p. 12).

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He muses that his mother and the other 60,000 prisoners:

Had never been taken away after all, but were still living crammed into those buildings and basements and attics (Bell, 2001, p. 189).

In some sense they were after all, the world is composed of matter in various stages of decay and traces of human DNA might still be found there. But with Sebald, this is less about the bio-chemical than it is about the psychological and the temporal character of the town's architecture, which has the aura of the uncanny classically associated with loss and transition.

For Austerlitz, the cumulative effects of encountering the now deserted town, its Ghetto Museum, and photographs of the charade of bucolic camp life is profoundly disorienting. With regard to the latter, in fact and in Sebald's fiction, a particularly insidious distortion of reality took place at Theresienstadt in 1944, when the Nazis converted it into a picturesque Potemkin village to deceive Red Cross inspectors. Through Austerlitz's confrontations with jarring evidence of evil's effects – effects which are embalmed in the physical fabric of present-day Terezin – Sebald gives us to understand that space is designed as much by time and narrative as it is by its material presence.

This fusion of past and present also happens outside the pages of the novel, as when a street sign morphs into memorial, as it does with Stih and Schnock's project in Berlin (below) in which constructs of past, and present coincide. Their project calls attention to the way the Nazis used time to dilute the impact of the Jewish laws, staging them over months and years to hide the full extent of their program of dehumanization.

Fig. 24 - Jews in Berlin may only buy food "between four and five o'clock in the afternoon," (July 4, 1940), Places of Remembrance, Renata Stih, Frieder Schnock, Photo: Ian Johnson, 1993

Likewise, James Fenton's poem "A German Requiem," positions objects meant for one temporality into another, here in the aftermath of World War II. In the midst of chaos and destruction in 1940s Berlin, care is still taken to design a response to death. As the poet writes (Farrar et al., 2006, p. 15):

But when so many had died, so many and at such speed,
There were no cities waiting for the victims.
They unscrewed the name-plates from the shattered doorways
And carried them away with the coffins.
So the squares and parks were filled with the eloquence of young cemeteries:
The smell of fresh earth, the improvised crosses
And all the impossible directions in brass and enamel.

The brass and enamel name-plates meant to welcome the dead home in some near or distant future now mark their permanent dislocation.

One imagines that it would take small acts of patience to unscrew them from their 'shattered doors' and affix them to coffins. Here, the expedience of wartime burial is tempered by improvised displays of tenderness (Yelavich, 2019).

Informally but no less profoundly, design offers a modest bridge between two states of being, momentarily assuaging the most radical temporal split. Inert pieces of metal become synonymous with life in

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death. Unnerving distortions of time and space are not confined to the heterotopic spaces of criminality or war. They can also infiltrate supposedly normative situations, as they do in Raymond Carver's short story "Why Don't You Dance?". In it, a man stages a yard sale of the contents of his home. The bedroom's furnishings are laid out on the front lawn exactly as they were in the bedroom.

> The mattress was stripped and the candy-striped sheets lay beside two pillows on the chiffonier. Except for that, things looked much the way they had in the bedroom – nightstand and reading lamp on his side of the bed, nightstand and reading lamp on her side. His side, her side (Carver, 1989, p. 3).

What didn't fit on the lawn was staged in the driveway. Even the appliances were hooked up.

> [E]xcept for the three cartons in the living room, all the stuff was out of the house. He had run an extension cord on out there and everything was connected. Things worked, no different from how it was when they were inside (Carver, 1989, p. 9)

We are never told if the occasion for the sale is a divorce or a death, but it's clear that the man of the house has set out the tableaus. There is no girlfriend or wife in sight, though a couple shows up and meanders through this strange domestic simulation. The man invites the couple to drink with him; the boy passes out and the girl agrees to dance to one of the man's records. He tells her that he hopes she'll like the bed.

> Later, the she talks about it with anyone who will listen, trying to understand what she felt surrounded by things that felt depleted yet still emanating something of their past. Something was transferred in the dance that cannot be dismissed (Yelavich, 2019, p. 216).

In Carver's prose we hear an echo of architectural historian Anthony Vidler on the subject of the uncanny, when he writes of "the inhospitable context of [being in] the here-and-now at the same time as imagining a there-and-then".

What else is a yard sale but the transference of goods and their pasts to someone else's future? Here the innocence of the transaction is compromised by time, the time to which the bed continues to bear witness, the time before it had to be sold.

4.2.2 Immediate time

The second temporal perspective I want to discuss flows from the present-tense processes of thinking, making, and perceiving. While the work of design often includes long phases of research, the synthesis of that research into an outcome generally happens in a compressed time, one that often feels immediate.

The psychologist Mihály Csíkszentmihályi describes this state of absorption (be it designing, writing, or conducting surgery) as one of 'flow' (Csíkszentmihályi et al., 2014). The term is particularly useful here as it doesn't reduce time to a point but rather to the time-space we otherwise call 'now'. The precondition for entering that space is practice. Until then time is choppy. Even the most experienced of hands can find that the process of mastering a new technique proceeds in fits and starts.

These are the circumstances in which we meet a potter named Cipriano Algor in Jose Saramago's 2002 novel *The Cave*. Algor has been making earthenware dishes and jugs his entire life and suddenly his wares are no longer in demand. The modern 'Center' that had been his main client only wants wares made of plastic. Rather than give up his life's work, he decides to make a new ceramic product: figurines.

But configuring clay into the miniature nurses, clowns, and other costumed characters proves exasperating. The clay doesn't cooperate. Saramago's omniscient narrator offers an explanation – one that demystifies what is otherwise called the design process – observing that:

> Very few people are aware that in each of our fingers . . .there is a tiny brain. The fact is that the other organ which we call the brain, the one with which we came into the world…has only ever had very general, vague, diffuse and, above all, unimaginative ideas about what the hands and fingers should do. …The brain has never been curious enough to ask itself why the end result…bears so little resemblance to its instructions to the hands. Anything in the brain-in-our-head that appears to have an instinctive, magical, or supernatural quality – whatever that may mean – is taught to it by the small brains in our fingers. In order for the brain-in-our-head to know what a stone is, the fingers first have to touch it (Saramago, trans. from Costa, 2002, p. 67).

Like all designers, Saramago's potter draws on knowledge gleaned in two different time frames. His process involves both his past experience working with kilns and clay and the unpredictable behavior of the medium in the present. Algor gradually achieves proficiency and production proceeds apace. The deep pleasure of mastery is his, until he must break the rhythm of the studio and present his work for sale. Again, he finds he is out of step with the market's tempo. The Center's buyers tell him the figurines

Most likely use for modern consumers would be for target practice (Saramago, trans. from Costa, 2002, p. 287).

The values of speed and novelty reject the temporality of intensely concentrated work, and the manufacturing process itself mitigates against the pleasures of 'flow'.

Just as designing opens up a 'state of exception'[2] from time, so does love. In Orhan Pamuk's 2009 novel *The Museum of Innocence*, a young man's infatuation thrives in an atemporal oasis: the family home of the woman he adores. Having missed the opportunity to marry Füsun when she was free, the protagonist Kemal contents himself with visiting her at her parent's apartment in Istanbul with the innocent explanation that he's a distant cousin. This goes on for eight long years. Every evening that he sits with Füsun and her parents the Keskins, he enters a romantic purgatory. Counter-intuitively, his willing immersion into that space makes him that much more attuned to how time is measured and designed. The most conventional mechanism, the wall clock, serves both

A reminder to the whole family of time's continuity, and to bear witness to the 'official' world outside (Pamuk, trans. from Freely, 2009, p. 283).

Public and personal also co-exist in other domestic technologies: wristwatches and televisions, still a novelty in 1970s Turkey. Every night at seven o'clock, when the news comes on, the Keskins

2. The term 'state of exception' is a term associated with the philosopher Giorgio Agamben and usually refers to extreme political actions that dispense with the rule of law. Here it is used to refer to a condition that dispenses with the laws of the marketplace.

synchronize their watches with the start of the national broadcast. Kemal muses that as they did this, they

> felt the presence of the millions of other families, all doing likewise, and the throng that was the nation, and the power of what we called the state, and our own insignificance (Pamuk, trans. from Freely, 2009, p. 286).

(Note the novel takes place in Turkey when it was governed by Mustafa Kemal Atatürk, who sought a homogenized nation). Here, Pamuk's protagonist is describing time-keeping as both a collective pledge of allegiance and an acknowledgement that:

> It was not Time we remembered but other families, other people, and the clocks that regulated our business with them. It was for this reason that Füsun studied the clock on the television screen to check if she'd adjusted her watch 'perfectly', and perhaps it was because I was looking at her with love that she smiled so happily – and not because she'd remembered Time (Pamuk, trans. from Freely, 2009, pp. 287-288).

Love and the informal social bonds forged in daily life have nothing to with official 'Time' – what Pamuk calls the "evil line" that reminds us of death – judging by the preponderance of evidence, design seems partial to the linear model of time, moving it ahead with the ticking of the clock, the shifting dots of LEDs, even the shadows on the sundial.

That said, Pamuk offers an exception to the rule in a story about a watch owned by Füsun's father that

> had two faces, one in Arabic numerals, and the other in Roman (Pamuk, trans. from Freely, 2009, p. 289).

'Time' doesn't disappear entirely here, but the Eastern and Western dials do make the point that it is variable.

Fig. 25 - Askew Clock, Tibor Kalman, 1989.

Perhaps the best that design can do is to complicate time, offering cues that our awareness of it is conditioned as much by emotion as its diurnal rhythms. That time is fungible is also apparent in Tibor Kalman's Askew clock, below. Like Pamuk's protagonist, Kalman recognizes that time is fungible, told by durations of pain and pleasure, of boredom and curiosity.

4.2.3 Time as yet-to-be

The temporality of the 'yet-to-be', once considered a void, has become particularly congested today with the advent of speculative design and its offshoots. Such work is undertaken in large part in response to global warming and its attending social and environmental consequences that threaten to poison, if not entirely preclude, the future.

There is, however, another sense in which design can signal the future. It acts as the embodiment of hope in the face of uncertainty. A poignant example is to be found in Wisława Szymborska's poem "Clothes".

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A woman has just seen her doctor, who tells her to see him again and that for now:

It's not too bad (Szymborska, trans. from Barańczak and Cavanagh, 1996, p. 137).

After he leaves the exam room,

It's time to tie, to fasten with shaking hands
shoelaces, buckles, velcro, zippers, snaps,
belts, buttons, cuff links, collars, neckties, clasps
and to pull out of handbags, pockets, sleeves
a crumpled, dotted, flowered, checkered scarf
whose usefulness has suddenly been prolonged.
(Szymborska, trans. from Barańczak and Cavanagh, 1996, p. 137).

Of all the objects and attending gestures involved in getting dressed, it is the scarf that matters most here. Unlike the mechanical and structural "zippers" and "sleeves", the explicitly "dotted, flowered, checkered" textile is ornamental. Where she looking to a future of hospital gowns, it is unlikely the poet would take such care in dressing and more significantly add the ornament of the scarf.

Where Szymborska uses cloth to signal that there will be a future worth dressing for, Bruno Schulz uses it to fabricate an alternative future – a counter-scenario to the one being pursued by Germany at the time – *The Street of Crocodiles*, published in 1934, is set in the small Polish town of Drogobych, now part of western Ukraine. In it, the narrator's father offers a "Treatise on Tailors' Dummies, Or, The Second Book of Genesis", claiming

The Demiurge... has had no monopoly of creation, for creation is the privilege of all spirits. Matter has been given infinite fertility, in exhaustible vitality, and, at the same time, a seductive power of temptation which invites us to create as well (Schultz, trans. from Wieniewska, 1977, p. 59).

To break that monopoly, he proposes to create a species of beings with deliberately limited capacities. There will be a different creature, each with only one limb, for every gesture. Moreover, they will not be precious.

We shall give priority to trash. We are simply entranced and enchanted by the cheapness, shabbiness, and inferiority of material... "In one word" Father concluded, "we wish to create man a second time in the shape and semblance of a tailor's dummy" (Schultz, trans. from Wieniewska, 1977, p. 62).

The tailor's dummy is an argument for an imperfect future – the opposite of a future – uniformly populated by Aryans. It is also neither golem, nor superhero; it is not envisioned as a savior. Instead, it is a rejection of all utopias. Schulz could have made his argument against purity without resorting to materiality (the stuff of design) or referencing the figure of the Demiurge (the designer). That he chose to do so suggests an understanding that the future is not abstract, that it is made, tailored as it were.

Though he would have been no stranger to history of pogroms, it is unlikely that that Schulz could have anticipated the implementation of Hitler's Final Solution. And yet, there is a prescience to the tale of the tailor's dummy. This is true not just in his affection for ungainly creatures (perhaps surrogates for the denizens of the Jewish ghettos), but also in his attention to the liveliness of the materials they are made of, writing:

Matter never makes jokes: it is always full of the tragically serious.... Can you imagine the pain, the dull imprisoned suffering, hewn into the matter of that dummy which does not know why it must be what it is, why it must remain in that forcibly imposed form which is no more than a parody? (Schultz, trans. from Wieniewska, 1977, p. 64).

In this Schulz anticipates the new materialism[3] almost a century before it entered the consciousness of design, an example of which we see below in biodegradable bottles designed by Ari Jónsson. Made from oceanic algae, they exhibit the kind of imperfection that Schulz's tailor wants to will into being.

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3. Susan Yi Sencindiver writes that new materialism rejects "received notions of matter as a uniform, inert substance or a socially constructed fact, new materialism foregrounds novel accounts of its agentic thrust, processual nature, formative impetus, and self-organizing capacities, whereby matter as an active force is not only sculpted by, but also co-productive in conditioning and enabling social worlds and expression, human life and experience". https://www.oxfordbibliographies.com/view/document/obo-9780190221911/obo-9780190221911-0016.xml Accessed 1/28/20.

Where Schulz was tacitly addressing the future of the Jewish people, Jónsson is speaking to the survival of all sentient beings whose futures are already compromised.

Fig. 26 - Biodegradable bottles, Ari Jónsson, 2016.

4.3 Conclusion

This chapter has looked at time as latent in things with Sebald, Carver, and Fenton. It has considered time experienced as an elastic present embedded in the act of designing with Saramago and in response to designed timepieces with Pamuk. With Szymborska and Schulz, it has also looked at design as aspirational and prefigurative.

The careful reader will by now have concluded that design embodies all of these notions of time and that their validity as distinct design behaviors is a matter of perspective. Even if it is the case that design is inherently multi-temporal, *experiencing* design as simultaneously retrospective, present, and propositional involves practice and risk. As Vladimir Nabokov warns:

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A thin veneer of immediate reality is spread over natural and artificial matter, and whoever wishes to remain in the now, on the now, should please not break its tension film. Otherwise, the inexperienced miracle-worker will find himself no longer walking on water but descending upright among the staring fish (Nabokov, 1989).

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5. Time and (timely) behavioural patterns

by Indu Varanasi
Architect and interior designer, Dubai, UAE

Abstract

Time goes on!

But what is time? A measure of what?

A name of the rising and setting of the sun or is it the names of 'many moons ago'. Expressions to denote time or passing of it is expressed in different languages and different time periods through history.

The measure of 60min to an hour, which is accepted universally today, in our times was not the case for a good part of human history. In India, time of a day was measured in *prahars*, 8 to parts, 4 each in the daytime and nighttime. Several smaller measures were also there. The same goes for ancient Greeks, they too had a different system of *chronos, aion* and *kairos*. My intention is not to take you to a journey on time and it' measure but to understand the human behavior towards time and space.

How do we react to the same space in different times of the day?

How do we react to different spaces at the same time of the day?

How do spaces affect us? Do they really affect our well-being?

Is Globalisation and Technology making us lose our sensitivity towards Time?

Time is not represented by the various watches and clocks which man has invented.

Time is represented by the Sun, it's cyclic nature which brings about the life source of our being. Somehow, through-out history human has woken up with the rising sun and slept with the setting sun. The on-set of seasons is a process of change, old replaces new. The changes celebrated as festivals.

Time represents us as human beings in more ways than one. Each culture having it is own intonations to it. Time, habitat, food, and clothing represent us as human beings, who react and create these fundamental constructs and narratives, which then define the 'culture', 'religion' and day to day lives.

The universe is a time machine, and it acts as per with special sub-systems, which scientists are still discovering. Measured in different ways all coming down to the universal fact, that there is movement in the skies, and it has its consequences so to say on the earth.

We design our lives in many ways, our daily routines are guided by 'time'; our longer terms goals have a time frame. It is our own lives that we constantly govern or manipulate to suit. And as Architects and designers we are constantly anticipating how others behave, how others will react and behave in the spaces we design; how other factors like the culture, festivities, climate, and context determine the outcomes.

To dwell a little more deeply on this matter, I must go deep into this topic from different perspectives and understanding, what it means to be associated with different aspects, which affect us as human beings.

The drama of 'living' is closely related to the habitats, nature, climate, culture and so many knowing and unknowing things that one wonders, can we live in our own 'shell' ever.

The answer is NO and very difficult to explain. In the next few pages, I will try and explain this beautiful interconnectivity which we have and how our behavioural patterns are defined by Time.

The outcome of design has to factor in various time frames in which we perform, be it in the times we live in, the spaces we articulate and all the things in between which finds us in a situations beyond our control.

5.1 Time and us… now. To explore our changing relationships

Human beings are extremely conscious of time.

Through human existence time dictated everything in our lives from daily activities to special occasions.

Time is a measure we like to assign to everything, whether we have it or not, to do what we have to do. Time is a finite resource although we consider this as an infinite resource.

There is finite space (spatial configuration) and there is only a finite amount of time and somehow both these finite entities create infinite possibilities for us human beings.

It is the human spirit, with intelligence, memory and articulation of thought, word and manifestation that we are able to create our own habitats, distinct, diverse and ever changing.

Daniel Kahneman has referred to in his book *Thinking, Fast and Slow* (Kahneman, 2013) that:

Intelligence is not only the ability to reason; it is also the ability to find relevant material in memory and to deploy attention when needed.

It is our ability to find nuances, recall experiences and react to them when needed 'timely' makes us stand apart from other species. Has our ability to create lives beyond the basic needs of survival has made us arrogant that we want to ignore the basic structure of the universe and master it?

So, what is the need of these times, now?

Our now is being determined by of constant need for virtual interaction, our need to define ourselves in the world which does not exist physically as we have known it. There is constant glorification of the human being today forgetting the part of the ecosystem we live. Our ability to define ourselves as interconnected beings is our future to survival. It is in the world of the physical or meta-physical or spiritual realm the idea of time and our being is coined by the Buddhist monk Thích Nhất Hạnh in his famous word 'interbeing'. It is this thought that he is conveys in his own words.

This morning, before giving a Dharma talk [Buddhist lecture], I was having breakfast with my attendant, a lovely novice monk.

I paused and said to him, "Dear one, do you see the cow on the hillside? She is eating grass in order to make my yogurt, and I am now eating the yogurt to make a Dharma talk".

Somehow, the cow will offer today's Dharma talk (Thích Nhất Hạnh, 1999).

We, ourselves live in the context of the relationships with the time and spatial hierarchy of other living beings, we need to develop a contextual behaviour that has a direct consequence of our 'progress' and development. Our behaviour is not isolated, it is interconnected, and it is this thought that the Buddhist Monk reiterates through the concept of 'interbeing'.

The progress and development have led us to distributing ourselves in a manner which does not respect the relationship with nature, the concentration of people is leading huge congregations of human beings called cities, more population, it is a time to re-think our notion co-habitation.

Our interactions with nature are on the wane. If 2/3rd of the world's population is going to live in urban areas, the interaction with nature will be interpreted with a different meaning. We create places of 'natural' interactions like 'parks', curated animal habitats, water channels and so and so forth to define the urban setting.

Our buildings are more and more climate controlled, in spaces where the time of the day does not matter because artificial light is always there, the temperature does not matter because the air-conditioning is working 24/7. Our interaction in daily lives is reducing.

The concept of time is determined by regulation and sometimes our pangs of hunger only.

In The Harvard Gazette, William J. Cromie writes in his article "Human Biological Clock Set Back an Hour" about this relationship of circadian cycles which corroborates the link to our existence in tandem to the concept of "interbeing".

In more connected world, where time is determined by the source of the task, globalisation and work from home have given us a new meaning of 'time'; that time which recognizes only the 'hour' clock and is not in sync with anything in our natural universe.

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Tasks performed for clients in the US from India (being the out-sourced customer service capital of the world) for example, the have cycles of day and night completely reversed. The stress to co-habit with society during the day, family, children, parents etc. and work at night has created a strange imbalance at an individual level leading to burn-out (Raja & Kumar Bhasin, 2014). This topic is well research and documented in the 'Health Issues Amongst Call Center Employees, An Emerging Occupational Group in India' by Jeyapal D. R. and Sanjiv K. B.

Our need to be connected to each other is one thing, but in this rush, to forget the need to be connected to our larger habitat may cause a lot of problems and is defined below, in our need to understand the future. It is our time to think and understand how we are closely linked to the infinite cycles of time and the universe and it for us to determine our behavior. Human behavior affects our individual and collective being.

We are irrational now, but we think that we'll be rational in the future. That's why we outsource the current important decisions for our future self to handle. And when the future becomes the current reality, we feel regret for not being more rational in the past. That's time inconsistency. Our ever-changing self in the ever-changing world (Dumonski, 2021).

5.2 Time and space. Adaptation of human behaviour in built environments

Built Space remains constant. It is static, it does not move, it does not change. It is not living.

And yet, our reaction to the same space is different times of the day, night, and season. People react differently to the same space. But how does this space treat 'us'?

How an individual behave in a private space like his home is an interesting behaviourial study and is impacted by social class, location, economy, culture and sometimes only the basic need for survival.

Home is an interesting aspect of definition. The concept of *work from home*, seems to be new concept in burgeoning cities all over the world; however, there is a huge section of population, in the lower

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segments of society, who have always worked from home. I refer to the study of the largest slums of Asia, Dharavi, which encapsulates what a typical cohesive society does versus 'designed/planned' buildings.

It is interesting on how the space is transformed from a cooking space, to sleeping room to workspace, in the same limited area; allowing for childcare while 'work' is being done. Specific examples of the 'Khumhars' or potters is given in the context of redevelopment.

This article is student research called SRS (Slum Redevelopment scheme) by the Government of India. "Rethinking Dharavi: An analysis of redevelopment programs for slums in Mumbai, India" (Ransmeier, 2001). Abigail Ransmeier writes about the successes and shortcomings of slum redevelopment programs in Mumbai.

> The Kumbhars specialize in making pots, a craft they brought with them from their homeland in Kutch. Their traditional potting methods mandate specific spatial arrangements. Women tend to their homes and to their kilns, integrating their pottery activities with child-rearing and household chores. This unique way of life makes relocation to the proposed SRS buildings impractical (Ransmeier, 2011).

A lesson to be learnt, is how our homes have transformed themselves into our workspaces, and how this transformation has brought about different nuances of life and work interrelationships, which we have never considered in our 'sanitised' design of different set of design rules for residential, commercial, industrial etc. What designers need to consider is the ability to factor in time transformations into design of spaces. The ability of individuals to transform spaces as per their need and the time of the day/night.

Although a lot of research has been done through the years, the outcome in actual design practice is much more complicated and is perhaps lost in the narrative of 'rate per sqm' design.

The above article also observes the seamless way in which the community comes together as a fabric in a social system which is not translated in our living patterns in modern design solutions which defines are spaces into living room/bedroom etc. A re-think on designing living areas.

Public spaces have a great narrative behind them: enclosed public spaces constantly transform themselves, spaces where un-related

people use the space, it can bus stops, train stations, building lobbies, lifts etc.

Studies have been done on human behavior being conditioned by the environment, to quote "general perception that individuals are influenced by their built environment". In her essay "Architecture and the Human Behaviour", Kimberly Mah sights the two different scenarios of how the built environment is shapes the economy, behaviourial patterns including the utilization of time.

While all this is true and well- studied, an important aspect of how to factor 'time' transformation as an important parameter is often overlooked (Mah, 2013). To take an example of a Train station, the interaction of the space when people are rushing in and out of the station is very different when they wait for a train, how long is the wait, the factor of time defines the architectural definition of space to be serviced. The cultural nuances make a difference too, when the in Tokyo, people eat their food in the food stalls in the stations whereas in India, only people in transits (time in between) eat at stations. The same station transforms itself from being a short-term waiting area, to a long-term seating area to an eating place, all as a factor of time which the user controls.

If take a lobby of a public space like a business tower, the lobby is a transition space, a waiting space, extension of a retail, and sometime a place for events, all this factor in time of the day, time of special occasions and time spent. Lobbies become a precursor to the expectation and perception of how a building creates an impression on its users.

Bill Puetz in his article on *Making An Entrance: How Workplace Trends Are Influencing Building Lobby Design* (Puez, 2019) makes a case for real estate transformations based on this building lobbies which is an interesting point in redevelopment and refurbishment due changing times.

Would we like to look at building lobbies as spaces which can transform themselves in time, through the day, from circulation pathways or transition zones, to meeting places as extensions to café's during lunch time, to meeting places during work breaks. We need to understand that space like time is not static.

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5.3 Time and the city. How technology has influenced our cities

The telegraph may have made the country into "one neighborhood" but it was a peculiar one, populated by strangers who knew nothing but the most superficial facts about each other (Neil Postman).

If telegraph changed the way news travelled, the internet did the same in a much larger scale. We know everything about everyone and are still starved of 'news'. We are all connected to people we know or do not know in the virtual world and yet we lost our communities to physical this congregation of human populous. According to the (UNEP, 2020) by 2050 two out of three people will be city dwellers. Our cities are larger than any time in history, we spend more time in travel and commute than any past civilizations. Our cities are beginning to look similar, we have similar problems, congestion, pollution, lack of open spaces etc. However, there are fundamental differences in cities, it is their definition and cultural reaction to their contextual existence that define them in 'time'. Tokyo, Delhi, Sao Palo and others mega cities are 'big' but there is something which makes them different despite a certain commonality. To see cities just a congregation of people for economic activities, it is time to see and experience the 'world' is a collective experience of society.

Human has great ability is modifying spaces for different uses. Jane Jacobs is her seminal work *The Death and Life of Great American Cities* (Jacobs, 1992) has extensively described the need for 'flexible' spaces which change with time, spaces which get transformed from busy streets to bustling marketplaces, from open squares to congregational areas with an inherent ability of people to connect with each other.

To forget that the city is a collection of several people living together and recognizing the need to create the transformation through time is important to create a supportive structure.

Older cities, in places like India, have congregation spaces in places of worship, ranging from the neighborhoods (*nukkads, chowks)* to city wide celebrations. Depending upon which part of India we are, festivals vary; this is the relationship of time and culture.

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This transformation is spontaneous with collective expression of festival is the need to retain the local cultural context instead of one solution all and copy pasting solutions, which are making our cities look the same, look boring because we are forgetting the factor of the transient nature time, and transformation, through collectiveness, and for a reactive transient economy. Such transformations lead to temporary economies of tourists, festive sales of clothing, cultural icons (flowers, idols, caps, flags, food, etc.), which define a city's identity. In the research paper *Patterns of City Making* (Nivedita Varma, 2014) the author has bought out a comparison between the old city of Ahmedabad and new planned city of Gandhinagar in terms social nodes and connectivity which are defined as pulsating factors of a city's life.

Cities need to be planned to define time too and not just space. If the motorway only defines are city and all developments are either towers defining skylines or gated communities along a central spine(s); the city is only intermediate spaces left between defies the purpose of collectiveness of city. What we develop as pockets do not act a cohesive unit.

With human trust getting transformed into technological surveillance, a new city may emerge where movements are defined and guided. As technology defines our time, new patterns may emerge and spatial configurations of defining cities to zonal patterns of residential, industrial and commercial may merge like in the older fabric of cities. Time in a larger context of years governed by man-made inventions, discoveries and reactions is in constant motion.

Shoshana Zuboff (2019) in "The Age of Surveillance Capitalism", writes of a virtual behaviour model which are governing, directing and mis-directing our patterns of buy, sell, move, wear, eat which directly or indirectly defines our cities. The influence of the internet is just creating a collective experience like never before and so our behaviour is governed by several factors in the collectiveness of action or inaction for the time we are in sync with our interbeing.

5.4 Time and retail

What does a retail transaction entail, simple buy and sell? Someone buys from someone and sells to another. The simplicity of a transaction has many influences location, built-environment, security, age, culture and on-going narratives of the 'in-thing'. There essentially two types of retail regulated and unregulated (semi) and each of them behave very differently to time. Regulated retail in high-streets and shopping malls have timings, 10.00am to 8.00pm where these cluster of retail shopping offering open to 'sell' their wares. There is cyclic patterns of heavy footfalls during holidays, weekends, festivals or promotions and all returns to normal. The time of the year determines how much is the 'buy'. What is crucial here is to understand that in Shopping paradises like Dubai, shops are open almost always. The sense of time is completely lost, you want something you go and buy it. The movement of goods through the world has increased by multitudes. As per an estimate by Statista Research Department, Nov 23, 2021, the volume of trade (in billion tons) has grown from 0.6 in 2000 to 1.85 in 2020.

In modern cities like Dubai there is no concept of a 'local' produce; everything is brought is from across the world. Every major international retailer has a presence here. The region is now defining what happens when the world becomes one.

We suddenly lost the sense of 'time' in retail timings, retail product and more importantly retail identity. Everyone shops the same things and wears the same thing, have we lost the sense of who and where are as shoppers in the glitz of the 'big' mall in a modern city?

On the other hand, unregulated is very time specific. 'Produce' is available, and also a limited supply, so you can buy only when available within a time frame.

'Produce' is seasonal, so time defines when or which part of the year you can buy it. 'Produce' can be bought to your doorstep (in some places). 'Produce' is location specific and showcases identity of the place it is produced it. And finally, it does not travel miles to reach us. While there is merit in the fact that technology allows us to use similar virtual platforms, from anywhere on the planet, means that we are able to access goods and services from one part of the world to another.

While the notion of a connected world seems very beautiful and enticing; breaking all barriers of time we have, over a period of time created a 'same ness' which hurts because when everything is the same, there is no diversity. Diversity creates dialogue and innovation.

Regulated Retail needs to learn from the unregulated section of constant reactions time defined by culture, season, and availability – the need instead of pushing the narrative – of a sale without any responsibility and distinctive identity. An effort to a conscious effort in the direction is by a company called 'Hidesign' producing leather products in India with an approach to revive chemical less tanning methods to treat leather and make products which suit the modern taste and design 'Hidesign'. They have been able connect a time tested ecological effort with a fashion vocabulary of the modern times. In this process they have also been able reach out to various parts of the world. This a high fashion brand which creates the narrative of distinctive design philosophy which is timeless. Regulated retail needs to find the right balance of respecting the time and thereby creating built atmospheres which do not respect the 'time' but create artificial atmospheres which does not believe in day or night or summer or winter.

Is it that the new malls are only acting as entertainment centers with shopping becoming another entertainment rather than a transactional need? With retail digitization, the factor of time for shopping becomes almost irrelevant and design needs to tackle experiential qualities which are well documented by Anna Barbara in her book *Extended Store* and concept of 'Time' and the relationship of the 24/7 shopper.

Time as factor in Retail has to be treated with caution and as product of a continuously changing virtual experience (Barbara & Ma, 2020). The difference between a need-based shopping to an experiential shopping might be the key to what aspirational values are created to make the sale.

5.5 Time and identity

There are two levels to understand 'identity': defined by our multitudes of individual existence (daughter, mother, wife, doctor so and so forth); and as collectives of society in different parts of the world (from a country, city, districts, neighborhoods, etc.).

At the individual level we are the same people, who behave differently at different times of the day in from being in the comfort of their homes where their interactions maybe casual, intimate to formal depending on who is present in the same space and what time of day it is. A daytime interaction is very different from a nighttime. These subtleties define the sensitivity to design patterns and circulation systems. The same individual is very different in a workplace, the formality of an American corporate is very different from an artist's studio in Pondicherry in India and yet both are work. Culture, type of work and the very perception of work is different. Identifying the spatial relationships in a cultural context is important in design solutions. And at a collective societal level (defined partially by geography too), summer is celebrated the temperate climates and holiday seasons cater to this time of year whereas the same summer is dreaded in the tropics for its unrelenting heat. Clothing, festivities, holidays, weddings, all are sub-set of the collective consciousness of difference. Time of the day in a place, cultural context, social fabric and geographical context all require a connection which is being ignored in our attempt to unify everything as a 'global good' is defying the time of existence and embracing the difference.

And finally, our digital identity, seems to define everything of our being today. In his book Digital Minimalism, Cal Newport has identified various factors which make us products in the digital world and how we are becoming pawns in our digital world.

People don't succumb to screens because they're lazy, but instead because billions of dollars have been invested to make this outcome inevitable (Newport, 2019).

How we spend our time today will determine our future tomorrow; it is our behaviour with time its components, constituents and consequences which will determine the tenacity of human existence.

Human existence is undeniably linked to time as factor of mere existence, whether we do it in tandem with our fellow living creates and the earth is our choice and only 'Time' will tell.

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6. International space station as time machine. New routines of everyday life: establishing a time in space

by Annalisa Dominoni
Department of Design, Politecnico di Milano

Abstract

Living and working on board the International Space Station (ISS) produces a cognitive, postural, physiological, and semantic 'shift' that significantly affects the thoughts, emotions, and behaviours of the crew. The routine of everyday life is altered by different conditions, including confinement and microgravity, which have a decisive influence on the perception of space and time. In addition, there are two orders of 'space': the one inside the *time machine*, the spaceship, and the one 'outside' seen through the windows of the Cupola, the Cosmic Space, the void, the infinity.

The idea of considering the ISS a time machine is fascinating.

During the orbital journey around Earth at a height of 408 kilometers, the astronauts live 16 sunrises and 16 sunsets in 24 hours, every 90 minutes. How can this extraordinary experience not affect the physiology and especially the psyche of human beings who have lived their daily life through days marked by the natural cycle of day and night?

Time is a fundamental dimension of everyday life. We cannot see or touch time; however, we can unequivocally perceive its passage and adapt our behaviour accordingly. Like other senses, our perception of time is not true, but rather is modulated by changes in the environmental context. Experiences suggest that emotions can be powerful modulators of time perception that could be analysed

according to different parameters – including neuronal mechanisms and networks, cognitive functions, awareness (which implies cognition), age, and culture – whose interrelations and effects are not yet well known, but become of extreme interest to those who must design environments in confinement and microgravity conditions, like space stations, the ISS and the future Gateway, but also future habitable bases for the Moon and Mars. In this essay the author – Space Architect with 20 years of experience in the design of objects, equipment and extra-terrestrial environments, as well as Principal Investigator of several experiments carried out on board the ISS with the collaboration of astronauts – proposes a perceptive and cultural 'shift' that presents the ISS as a *time machine*, in which the role of architecture and design is to 'mitigate' the effects of the extraordinary environment lived in Space trying to bring back the 'weightless inhabitants' a condition of balance and increased well-being.

6.1 The design of gravity determines a cognitive "shift"

The assembling of the International Space Station (ISS) in orbit began in 1998 and started to be habited in 2000. Today, more than twenty years later, it remains the only experimentation project shared by several nations that has managed to be an anticipator, and at the same time, a virtuous example across the current and emerging macro-themes of our time as Space Design. Beyond the extraordinariness of the project itself – the first and unique International Space Station orbiting the Earth able to continuously accommodate crews with the aim of investigating life in Space and the effects on the human being and conducting scientific experiments to improve life quality and well-being – and especially, the conditions that differ most from the terrestrial ones to which we are accustomed including the lack of gravity, the confined environment and cosmic radiation, other aspects to consider are equally important, which concern the inevitable cognitive 'shift' that crew experiment living and working in Space and that change completely how to relate to theirs bodies, the daily life activities, people, and the environment on board, including the time variable.
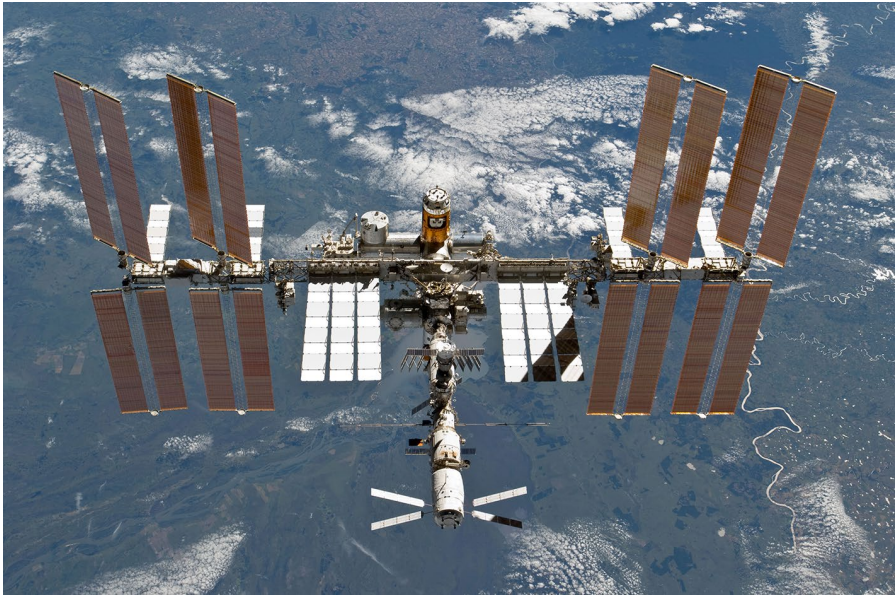
Fig. 27 - The International Space Station (ISS) at the final configuration stage. Credits by NASA.

We live on our planet unknowingly connected with gravity, the great cosmic architect, who tirelessly draws our habitat and in the same way we live with the unknown, embrace it, inhabit it.

In Space, out of the Newtonian world of which we have experience, gravity becomes a variable that transforms in relation to the curvature of space-time, a line on which to slide, without effort. Gravity is a modeler, a constraint and a variable: it is the first and largest *designer* capable of creating new conditions and constraints unknown to our traditional way of living and relating with the body and the surrounding environment.

In order to approach the 'unknown' and experience what it means to live in Space, and above all, how design for Space in which human beings must live, a conceptual and formal shift is required that extends to thought, from the point of view of housing size and behaviour. In Space the human body undergoes strong physiological, sensorial and perceptive alterations. Sensory deprivation in confined environment, lack of natural light and microgravity significantly affect the shape, posture and functioning of the body, as well as the feeling of having

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no weight, floating without reference points and spinning alters the perception of self and environment. Few are aware of the rapid bodily transformations that the human being experiences in microgravity.

The funny definition 'puffy face' among the scientific community is to indicate the visible result of the redistribution of bodily fluids pouring from the lower to the upper body – because the redistribution system works like on Earth, and it also continues in space to counter gravity by pushing fluids upwards – causing the circumference of the waist to increase, while the legs become thinner, and the face becomes puffy, and a total change of the body shape and balance.
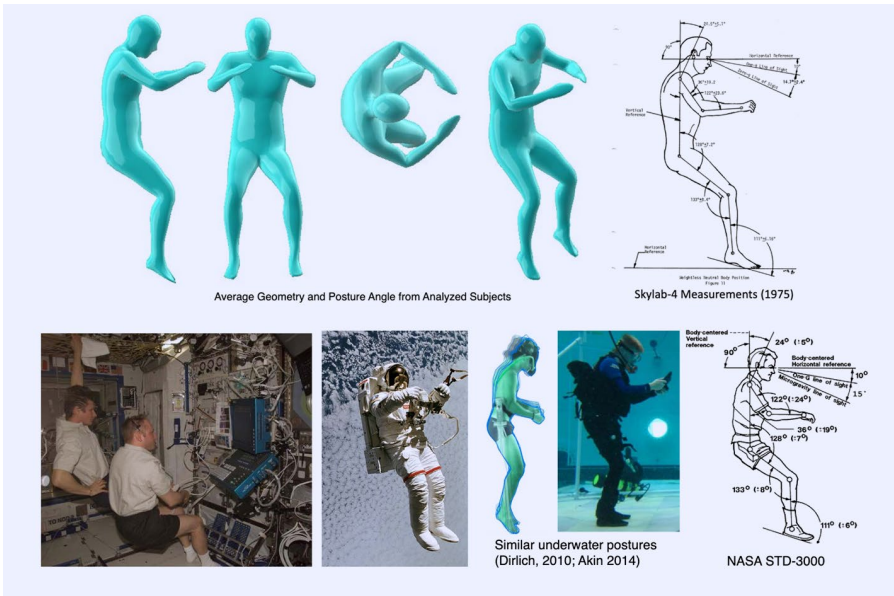
Fig. 28 - Examples of Neutral Body Posture (NBP) in Space and similar underwater postures with average geometry and measurements. Credits by NASA-STD-3000 (2019).

Beyond the harmful effects caused in particular to the nervous, cardiocirculatory, muscular and skeletal systems, definitely determinant but not so primary to consider for a designer in his design, what I am interested in is the alterations that modify the shape of the body, the new postures, the movements to maintain balance and to move from one point to another, the use of space, usable in a total way,

in which there are no floors and ceilings, but only surfaces to anchor to. The observation of these phenomena is fundamental to design equipment and objects that can restore an acceptable balance between the various extraordinary conditions and allow the crew not to feel so alien to the environment (Dominoni, 2012). The Neutral Body Posture (NBP) is similar to the posture a body takes on underwater, and it seems to mainly result from a new balance of muscular forces in relation to the tension deriving from fabrics acting on the body's joints.

To be more specific, when the body is relaxed, it moves into a semi-curled up position in which the knees and elbows are at an angle of approximately 130 degrees. The pelvic angle changes and the curvature of the backbone flattens out around the lumbar and chest areas, due to the fact that no pressure is exerted on the discs, causing the body to extend by over 10 centimeters. The head and spinal cord fold forwards and the upper limbs rise up towards the trunk by 450 degrees. The result is a "new body" in variable order, experiencing a 'disorienting space'.

In Space change the orientation, the sensory perceptions with respect to the volumes of the objects, to the colours, that without the pressure on the retina appear more nuanced, to the tastes and, as a consequence, also the thoughts change, emotions and relationship systems that affect the operational and performance of the 'time astronaut', so precious and expensive in Space missions.

6.1.1 Homunculus vs gravity: disorientation and transfiguration

The disorientation of the body is not only determined by the physiological changes due to the microgravity, but also by the different perception of space, of our body in the space, and of the way we relate to it and to others. We perceive the world in which we live through our body and a system of cognitive processes that are represented by the map of the *cortical homunculus*, a topographical neurological interpretation to define the unique relationship between the different parts of the human body. The cortical homunculus is the subdivision of a part of the cerebral cortex, in the form of a map, to represent the body scheme of man. It's a somatotopic representation

of the human body pattern that was developed by Wilder Penfield in the 20th century. The size and order of the different parts of the body depend on the amplitude of the dedicated motor brain tissue. This means, for example, that the hand, which has enormous sensitivity and multiple functions, will take up more space than the elbow.

Fig. 29 - Homunculus somatopic representation. Credits by the Author.

The result is a distorted human body, a 'homunculus' precisely, with hand, very large tongue, trunk, and smaller limbs, that is divided into psychic homunculus and motor homunculus. We react to the stimuli of the external environment through actions determined by cognitive 'pre-sets' (conscious and unconscious) that we accumulate living and experiencing and that allow us to move and interact with others and the environment around us, but that in Space do not serve and require mutations.

Fig. 30 - In Space on board the ISS we experience spatial disorientation and transfiguration: there is not up and down, unless by convention, and the chaotic environment aggravated the sense of balance. Credits by NASA.

Orientation implies an awareness of the position that everyone occupies in space, the changes of its own and other elements in space. Gravity determines an above and a below, a right and a left, and consequently, a spatial orientation built by convention. On board the ISS, thanks to microgravity, a spatial transfiguration takes place, a change of aspect in relation to the spatial position: talking to another person by looking at his face upside down undermines the identification and recognizability of traits that we are used to codify only on Earth. In Space *new kinaesthesia and gestures* are created.

Proprioception (also known as kinaesthesia) is the ability to perceive and recognize the position of one's body in space and the state of contraction of one's muscles without sight support and is of fundamental importance for movement control through sensory feedback neurons.

On board the ISS, the lack of gravity requires a different postural adaptation compared to the terrestrial one as well as the calibration of forces to take an object must be remodulated and muffled: the gestures

are soft, the movements slowed and more conscious, more directed to the action, more studied because unpublished and to experience, to observe.

Designing for Space means dealing with an "unknown dimension" that is not part of the Earth's experience and that resets all the parameters that we have consolidated over time to form our mind maps and move around the world with more efficiency and participation. In my experience designing for Space I can say that one of the most ability is to *predict experience*: ss designers unable to personally experiment with our designs through prototypes and full-scale environment, we have to get used to predicting how an object will behave in space, how it will be used by astronauts and how it will relate to them and the surrounding environment, what kind of experience it will offer, considering that lack of severity alters many physical and cognitive parameters that we have no experience of. For that reason, I created a new methodology, specific for Space Design, called Use and Gesture Design (UGD) in which the new objects, the equipment and the surrounding environment are imagined and formed simultaneously with the gestures that the human being will have to put in place to interact in the unknown dimension characterized mainly by confinement and reduced gravity (Dominoni, 2002). That means projecting the features of the future object on the scene of its possible uses, and visualize it in action: in your hands, put on you, in the environment to zero gravity where the object will be used, and foresee how it will be used, in which ways, in which environments and with which interfaces. In the design process, the artifact is of equal importance compared to the usage's scheme and creation of an idea, a concept design for the space, derives from the simultaneous design of action, movements and gestures that are simulated in function of how and could be used the designed object. The challenge is to imagine how Earth's cognitive "pre-sets" in Space can be redefined as we immerse ourselves in a completely unknown environment, and especially how these 'zero-gravity re-sets' can induce new behaviours.

6.2 The confinement in Space changes behaviours and perceptions

Beyond microgravity, the other major difference between living on Earth and in Space is the confined environment, which involves a series of sensory deprivations essential for the physiological and psychological balance of the human being that directly affect cognitive behaviour, and also, the perception of time.

Living in *isolation* for long time produces a quantity of negative effects on the human physiology and psychology that impact on the quality of life and at the end on the general wellbeing of the crew. The wellbeing of the astronauts depends on a series of *environmental stimuli* such as light, colours, variations in the air, wind, heat, cold, smells, tastes, etc. which are normally present on Earth, and which are able to activate vital body functions.

The human being reacts to these stimulations by tuning his or her equilibrium to nature and to the surrounding environment, and the lack of even one of these stimuli can jeopardize the whole biological and mental health of the individual.

Natural daylight, for example, has a direct influence on the *circadian rhythms*: in a closed environment, these rhythms undergo strong alterations and thus cause problems of insomnia and general intolerance, compromising the health and the efficiency of the astronauts in the performing their activities onboard as well as the good results of the mission. Inside the ISS, for the moment, the artificial environment recreated inside the pressurized modules is unable to reproduce all the stimuli present in the terrestrial environment and, in the long term, this provokes a sense of monotony and a general lack of interest among the astronauts. The psycho-physical state of the crew members, who become more and more unmotivated, tends to reduce vital functions to a minimum, even if sometimes they try to find personal solutions to counteract this problem, as the initiative of the cosmonauts Anatoly Berezovoj who in 1982 spent part of his 7 months on board of Salyut 7 listening to a cassette player in which they had been recorded the sounds of woods, birds, wind and of the storming of the leaves, in short, the terrestrial sounds (Clark, 1988).

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The confined environment usually implies the crew to live a small space for long time in which more people have to share everything, *no privacy* at all, without the possibility to go out for a walk. It is sufficient to consider that the standardized dimensions of the living quarters on the ISS have an internal diameter of 4.6 meters which – considering the space taken up by the four racks, the modular replaceable "cupboards" which contain equipment, provisions, experiments and space for stowage and which are arranged around the cylindrical wall surface of the module forming a square section – is reduced to only 2.2 meters that can effectively be used by the astronauts (Peercy, 1985). The reaction to this extraordinary situation is the increasement of emotional stress, intensified by the fact of living in a *permanent state of emergency* that can give rise to feeling of anger and aggression. Astronauts are trained for manage that, but unpredictable situations can happen, and there is a *gap* between to be prepared to a mission and living and working on ISS. The crew must be able to check the aggressiveness that develops because of the lack of space, the forced isolation and the constant sensation of risk, a situation that is potentially aggravated by the heterosexual and multicultural characters of the subjects involved. Considerable tension has been recorded onboard among crew members (Raasch, 1985). A part the little space available, the isolation and the consequent *nostalgia* is the problem that generates the most *stress* and *depression*, even if the communications technologies and social media allow the astronauts to remain in contact with their families, and with the whole planet, in the most natural way possible.

6.2.1 Earth as a ready-made: the overview effect

The wonder that astronauts experience looking at the Earth from Space is not only about the perception of time but also extends to consciousness. It's called the *overview effect* and it's a cognitive change that many astronauts perceive as they look at Earth from space for the first time. Psyche, emotion, and spirituality seem overwhelmed by the dramatic change in perspective that occurs during space travel in the Earth's orbit or to the Moon, when our world suddenly appears as a fragile sphere in the immensity of the Universe. A unique and rare

place that is our home, the home of all humanity. Without territorial boundaries and social divisions, race, or religion.

Being able to see the Earth from another place in its totality as an object in itself determines not only a revolutionary change of perspective but also induces us to readjust our symbolic cosmology. Seeing the Earth as a small and rather squashed ball immersed in cosmic Space can be disconcerting and, perhaps, give us a greater awareness of how precious its resources are, particularly those non-renewable resources. But it can also cause "ecumenical disorientation", as Boatto has pointed out, due to the change in scale, because our planet, which we perceive every day on a real basis, is transformed into a de-contextualised object floating in empty space like some giant "ready-made" whose centre of gravity has been shifted into another dimension. Whereas the planet Earth that we walk upon remains a fragmentary concrete experience for us, when observed from outside – and for those of us who are not astronauts satellite images will do – it turns into a unitary image and, as an image, a symbolic object, something abstract that we can no longer relate to our own experiences. Whereas Duchamp dissociated objects from their setting and their practical purpose, placing them in art galleries and thereby changing their meaning – causing a certain bewilderment on the part of onlookers – technological innovation applied to cosmic exploration has the same effect, transforming the Earth into a mega-object and altering the onlooker's perception of their place in the world.

Art, science, and technology often come together and play an important part in defining our material world and the relational structures forming the society in which we live: integrating them together as part of a much more complex and elaborate process, which, from its historical roots initially based around craft reproduction and then industrial mass-production, extends to other current and future scenarios of art, architecture and design in which the boundaries between human creativity, scientific thinking, technological invention and controlled experimentation become increasingly thin (Dominoni, 2015).

6.2.2 New routines of everyday life: establishing a time in Space

The confinement then causes a series of alterations that affect the course of the activities in orbit and the behaviour of the astronauts, their feel. But the thing is very complicated if we consider that the confined environment, closed, is lived (from inside) only in part: the view of the Earth from the Cupola of the ISS, the Earth "from outside" and the fast passages of 16 sunrises and 16 sunsets that follow each other in the span of only 24 hours create a 'split' time: there is time inside the *time machine*, which artificially reproduces the 24 Earth hours with the cycles of day and night in line with those of Earth; but there is also a time outside that flows very fast and that if we consider the rhythm of natural light, it corresponds to 16 days instead of one.

This is astonishing! Inside the *time machine*, the *dualism* experienced by astronauts in Space compared to that of outer space that astronauts can observe is even more exasperated by the wonder emotion of the extraordinary experience of looking at Earth, its sunrises and its sunsets "from the outside", because it is confronted with an internal and daily reality that be lived through a time programmed precisely, decided months before their mission, a time in which work, rest, make fitness, lead the experiments, the ordinary maintenance activities of the ISS, as well as those related to personal care, are scheduled by programs and procedures that leave no room for personal interpretation, let alone emotions. The new routine of everyday life in Space creates an *artificial time* that does not coincide with the outer time-space, nor with that perceived within a confined environment, and not even with that perceived according to the situations and moods.

Time perception is a fundamental human function involved in all activities of individuals. Today, the clock and calendar are among the main cultural symbols of the western industrial society. The concept of *linear time* in the western world has been the basis of intellectual and religious thought for many centuries. Western time was conceived as directional, advancing, and *non-repetitive* (Helman, 2005). The cultural concepts of aging are closely related to the cultural concepts of time. Many different concepts of time have been described as: the time of human development, the time of the calendar that describes the

division of the year, the religious time related to feast days or fasts such as Christmas, Easter, or still, the time of the social relationship which is related to personal events as the date of birthday, marriage, etc. In 1983, anthropologist Edward T. Hall described the predominant form of modern western time as "monochrome" time. In this perspective, time is conceived as a ribbon or road that extends from the past to the future, divided into segments called minutes, hours, days, months, and years. Thus "time is organization", essential for the smooth functioning of a complex industrial society, in which the actions of large groups of people must be coordinated, so that industries, shops, airlines, etc. they can all operate at the same time. In western societies, most people live at the *intersection* of different forms of cultural time, both linear and cyclical, which are imposed on them (exposure begins at birth, with feeding times and meals for children, and then continues throughout life). Each of these times can have important effects on the physiology and psychology of an individual, as well as on his behaviour. Despite this, many people live largely outside the clock (such as children, unemployed people or even people suffering from depression etc.) and there are often differences between the city's accelerated time and the slower time of the countryside. Monochronic time coexists with 'polychrome' time, which is less linear and less tangible. In this case, life is experienced as constantly flowing and not as rigid as in clock time. It is a common view in many parts of the non-western world: in more traditional agrarian societies, for example, time is often experienced as *cyclical time*, as it flows slowly and is *repetitive*.

It is known that our emotions influence the perception of time.

Time and perception of time have been studied by neuroscientists and psychologists for many years. It is now widely believed that emotions can alter our experience of time. Previous studies of emotional modulation on temporal perception focus primarily on behavioural and psychological experiments. In recent years, studies on the neurophysiological mechanisms of time perception have made much progress (Lake, 2016). Changes in excitement and attention have unique influences on time judgments and contribute to the emotional distortions of time perception.

Like other senses, our perception of time is not true, but rather is modulated by changes in the environmental context. Experiences

suggest that emotions can be powerful modulators of time perception that could be analysed according to different parameters – including neuronal mechanisms and networks, cognitive functions, awareness (which implies cognition), age, and culture – whose interrelations and effects are not yet well known but become of extreme interest to those who must design for Space looking at astronauts' behaviours and wellness.

6.3 Space design for time machine

Life in Space produces a 'shift' involving, as we have seen, several spheres, including cognitive, postural, physiological, and semantic, which has a decisive influence on the thoughts, emotions, and behaviours of the crew, and consequently, on-board performance that can determine the success or failure of a mission. That's why the role of Space Design is so important. Planning in order to improve living conditions, life and work in microgravity and confined environment, taking care of the health and physical and psychophysical well-being of the crew is a priority that does not only bring benefits to astronauts, but it improves the outcome of the entire mission.

The fascination of Space and the idea of considering the International Space Station (ISS) a *time machine* stimulates many questions that induce as many design's reflections: "How to create a balance in a confined environment without natural stimuli so necessary on Earth because they guide us in daily activities in harmony with our body and the surrounding environment?", "How to mitigate the sense of *spatial and temporal disorientation* that causes living and working in Space, "from the inside" and "from the outside?".

Is it possible through the project to help balance new physical sensations, perceptions, and emotions derived from moving without weight in spaces where references and directions are lost? What if imagine a "new Space routine" between work activities, experiments, and relaxation? How could improve the life and the perception of well-being living and working on board? And again, can memories activate another perception of time?

Our psychological relationship with passing time affects the quality and the wellness of our lives. What we know from the dawn of

psychology – and in a speculative way, thanks to philosophical thought, even from long before – is that our assessment of the past, in terms of satisfaction given by experiences as we remember having lived them, has a significant impact on our current satisfaction.

The attention to the quality of the present time, in psychological terms, has increased over time thanks not only to psychological interventions less focused on the past, but also thanks to the progressive interest shown by the world of professionals in awareness practices (Boniwell, 2009). The creation of well-being therefore seems to have a positive effect on the perception of time and on the quality of memories. Unfortunately, no experiments have yet been carried out in Space on the ISS to ascertain how the state of greater well-being can positively affect the entire balance of the crew. As a designer, however, attention to the comfort and mood of the astronauts is very important and as we have seen can affect the success or failure of an entire mission. So, what if we introduced *entertainment* activities for the crew to increase the wellness and mitigate the 'shift' which causes *disorientation* in Space?

I can give a concrete example of disruptive project on this topic, maybe the first at this time, concerning a new space station that Thales Alenia Space (TAS) has commissioned me with a recreational space, with *more room for astronauts' entertainment*. The assignment concerned Innovative Concept Design Solutions aimed to Emphasize the Italian Style by Design supporting the programme for a *New Orbital Infrastructure Recreational/Habitable Configurations* and specifically for *Window Design in Pressurized Modules* (task 1) and *Recreational/Habitable Module Interior Design* (task 2) introducing also proposals of fashion and products design elements in the interior's habitat under definition of TAS in Italy[1].

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1. I led and developed the project of the new spaceship together with Benedetto Quaquaro identifying, according to Thales Alenia Space, Preliminary Design Solutions for the Support to New Orbital Infrastructure Recreational/Habitable Configuration inside our Space4InspirAction Lab at the Design Department of Politecnico di Milano.
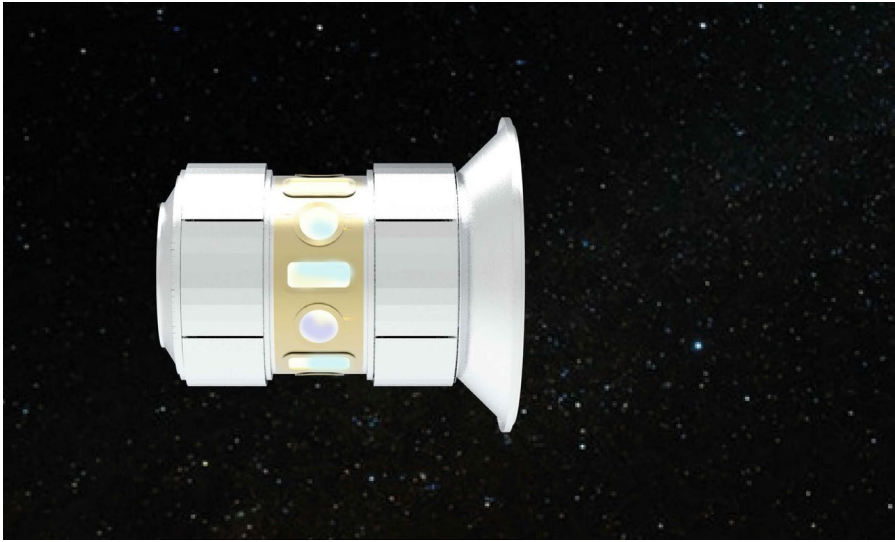
Fig. 31 - The new Space Station designed by Annalisa Dominoni and Benedetto Quaquaro for Thales Alenia Space has a strong identity: a precious object, a "Jewel in Space". Credits by the Author.

We applied design methodologies as User-Centred Design (UCD) and Use and Gesture Design (UGD), together with ergonomics aspects, to increase the comfort and the efficiency of the crew in confined environment and microgravity condition optimizing crew space usability and subsystem arrangement through flexibility and re-configuration. Our proposals concerning Concept Design Solutions for both external and internal configurations and volumes of a new Space Station were focused on the two tasks given: Window Design and Recreational/Habitable Module.

Concerning the task 1, our purpose was to design various solutions injecting style elements to the existing technical solution conceived by TASI to build a strong identity of the new Spaceship focusing on recognisability (also from outside the Spaceship) modifying panes alternative shapes and colours according to the materials' requirements.

Fig. 32 - The interiors of the new Space Station designed by Annalisa Dominoni and Benedetto Quaquaro for Thales Alenia Space promotes the entertainment time. Credits by the Author.

The goal we wanted to achieve was to transform the Spaceship in a precious object, a *Jewel in Space*, in the dark sky, designing a new configuration alternating round and oval windows as precious stones creating a 'ring' to highlight the window light stands out against the dark sky, if black, or the aluminum modules softly, if gold, or strongly, if red.

Concerning the task 2, the study of the internal accommodation of the recreational/habitable areas was focused on four topics: re-configurability, free room optimization, illumination adaptability, stowable functional furniture (e.g. working/lunch desk, restraints); the innovative design solutions related to fashion and products design elements in the interior habitat explored various possibilities among which *relaxing couch, privacy feeling enhancement* (e.g. isolation, including acoustic noise), handrails, foot restraints and stowage solutions focusing on aspect of technical feasibility and in compliance with the constraints/requirements given by the preliminary concept

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provided by TAS. Imagining the Jewel in Space from inside, it reveals an immersive experience into the dark Space, the feeling we want to transmit was entering the window, surrounded by glass – sliding into the interspace created by the round window – and "looking at the stars lying on the sofa".

We have re-designed completely both the exterior skin, including the windows, that alternate different shapes and create the idea of a transparent and continue surface, and the interior of the habitation module: an acoustic textile padding able to reduce noise and increase acoustic isolation covers the structure of the windows, as well as the interior of the module, creating sofa rings and giving a smooth feeling like a hug. The project of a New Orbital Infrastructure Recreational/Habitable Configurations was related to the request of Thales Alenia Space to find "Innovative Concept Design Solutions aimed to Emphasize the Italian Style by Design". The inspiration which has driven this not easy task was made by three keywords: *Italian Design – Sixties – Space Age.*

"Re-configurability" was the key to gain more internal space and flexibility. The racks on the International Space Station (ISS) are replaced by easily removable cylindrical volumes that can slide and transform themselves into "tailored chaises longue" for a free room optimization. The cylinders run on tracks serving as soft surfaces of support, as well as shelves, or removable containers. The internal space of cylinders it is foreseen for stowage of equipment and tools.

Flexible restraints to maintain softly the body posture on the cylinders/chaises longue are foreseen, as well as accessories for working, having lunch, resting and so on. Female Velcro® shapes are distributed along the whole soft surface to allow crew moving or maintaining the body posture thanks to male Velcro® socks.

The re-configuration of the internal spaces has been given to gain more free volume and flexibility according to the different activities and needs of the astronauts: working, relaxing, gathering, reading, playing and listening to music, resting, looking outside the windows, organizing meeting and lunchtime.

Light changes intensity and colour following circadian rhythms with the aim to change the perception of the environment according to the various activities, while the overall feeling is of relaxation and wellness. We put *wellness* as focal point of the whole project creating

a sensorial environment in which all senses were stimulated, to *contrast the lack of natural stimuli in Space and balance the disorientation feeling*. In order to reach the illumination adaptability, we imagine LED Rings for diffused light that change intensity and colour in relation to the various activities on board and integrating circadian rhythm system with chromotherapy: for examples, white-gold light during daily life activity, white-blue light when a relaxing environment is required, gold light for gathering, recreational activities and eating together or orange light for fitness activity that implies to be very active and energetic. Removable personal lights to be fixed where needed inside the space station were also foreseen. In addition, we propose to introduce light walls to divide virtually the interior space of the module introducing the use of Artificial Reality (AR) for fitness activities and immersive experience into nature.

The whole project has foreseen the design of the environment and the proposal of specific crew system/outfitting items and tools to be integrated into the interior with the aim to enhance space re-configuration for crew privacy and socialization purpose, as a collapsible textile partition made of innovative acoustic textile inspired by the "gennaker snuffler" used in sail competitions, and a foldable relaxing chaise longue to provide a support for relax and rest activities.

This project of a new space station is at the forefront of well-being and the importance given to crew entertainment activities to increase well-being and decrease the effects of *time machine* that alter cognitive aspects and perception of astronaut time. A comfortable, soft environment that envelops you as in an embrace, where it is easy to relax and observe the "Earth of the outside" lying down as if in a comfortable sofa at home helps to restore a mental balance that also affects the functioning of physiology creating a more relaxed and favourable attitude that has a decisive influence on the quality of performance and the best outcome of the space mission.

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7. Tradition and modernity / place and time
The island of Murano: past–present–future

by Peter A. Di Sabatino, Claudia Mastrantoni
Department of Design, Politecnico di Milano

Thing, order, character, light and time are the basic categories of concrete natural understanding. Whereas thing and order are spatial… character and light refer to the general atmosphere of a place… Time, finally, is the dimension of constancy and change, and makes space and character parts of the living reality, which at any moment is given as a particular place, as a *genius loci*.

Genius Loci is a Roman concept. According to the ancient Roman belief every "independent" being has its *genius*, its guardian spirit. This spirit gives life to people and places…

(Norberg-Schulz, 1980, pp. 32, 18)

We have an innate capacity for remembering and imagining places. Perception, memory and imagination are in constant interaction; the domain of presence fuses into images of memory and fantasy. We keep constructing an immense city of evocation and remembrance, and all the cities we have visited are precincts in this metropolis of the mind.

(Pallasmaa, 2005, pp. 67-68)

… the city is a construction in space, but one of vast scale, a thing perceived only in the course of long spans of time. City design is therefore a temporal art… At every instant, there is more than the eye can see, more than the ear can hear, a setting or a view waiting to be explored. Nothing is experienced by itself, but always in relation to its surroundings, the sequences of events leading up to it, the memory of past experiences… Every citizen has had long associations with some part of his city, and his image is soaked in memories and meanings.

(Lynch, 1960, p. 1)

Abstract

This chapter creates a rhythmic weaving of various critical theories of place- and time-based design through the writings from selected seminal texts. These themes range from larger scale, broad-based issues, such as the relationships amongst the past, present and future to more specific, smaller scale aspects with the inclusions of topics pertaining to presence, memory, meaning, experience, storytelling, narration, movement, and ritual. More explicit themes, such as layering and sequencing, are developed in the text. Importantly, they are visually articulated through focused design work exploring the various themes and a specific location. Time, movement, and change manifest in many rich and associative manners... including how relationships amongst existing and new places, people, and things may co-exist and change over time.

This focused weaving, with a bias towards time-based references, gets further woven into a specific place: Murano, Italy. Murano serves as a sort of ideal case study location for this exploration. And it exhibits strongly that perhaps place and time manifest with the most resonance in the city and in nature, and that perhaps the most 'natural city' is an island-city. Also, the past, present, and future of Murano, including its fame and dependence in glass making and creativity, is explored, and design proposals are included to communicate opportunities of place- and time-based research and design. This work shows how time can be made more plastic and elastic with a progressive approach to the possible continuum of past, present and future time. This theoretical, locational, cultural, social, economic and ecological 'starter-yeast' that combines with the themes of place, time and presence has been research, explored, and transformed into design work on the island of Murano. The design work and the images produced, therefore, inherently merge Murano with these themes and with other important intentions. They manifest the *ideas and paradigms* into tangible, visual expressions and articulated examples; and they show how design can be transformative. The design work looks towards the future, while being steeped in the present and past. This work merges urban, spatial, interior, landscape, graphic, product, and system/service design.

Lastly, the chapter briefly touches upon issues surrounding the relationship between design and research. It includes the basic paradigm positioning "design as research and research as design" in and beyond the academy. It calls attention to the importance of words *and* images. And it tries to advance the widely accepted position that research, scholarship, and creative work are fluid, interchangeable, and integrated entities… or that scholarship is both research and creative work.

7.1 Introduction and methodology

Place and time are the focus of this book, and also of this chapter. To realize greater consistency and coherency, the chapter will bias towards issues surrounding 'time' and 'time-based' design, but place, presence, and other themes and issues will hardly be ignored.

Immediate prior work is intimately linked with this chapter and its work. That work and other past explorations and experiences serve as initial steps in the development of this body of investigation and work… as this chapter will serve as the next steps for future work.

Time is always with us. The focus is on time, place, and presence. Key voices, or perhaps key players (as if in a story plot, orchestra, or team), include significant authors and seminal publications. The authors include T. S. Eliot, Christian Norberg-Schulz, Kevin Lynch, Robert Venturi, Colin Rowe, and Juhani Pallasmaa. These historians and critics contribute to establish and articulate some of the ideas and themes of a "time-based design paradigm", and hence bring a critical facet to the over-arching, meta-plot, and put into play the relationships of the other key voices. The voices, and influences, of Italo Calvino, Antoine De Saint-Exupery and others offer qualitative additions of tone, depth and breath, and speak directly to a narrative sense of relationships and rites.

The second key voice or player is Murano, Italy. This, of course, includes it physical properties, inhabitants, visitors, and its various tangible, quantitative aspects. Murano's qualitative and intangible heritage are equally important, including the histories, stories, and rituals of its people, objects, and places found, often latently, in its rich past, present, and future states. Murano's contribution of providing an

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explicit and specific context into this investigation and exploration is critical. Additionally, the future of Murano, including its long-standing position with glass and glass making, creativity and innovation, is explored. Its future is not so clear and predictable; and it seems that Murano can no longer simply rest or rely on its past.

While this falls within the general condition of towns currently facing declines in populations, economic activity, and overall sustainability, the particular historical and current conditions in Murano are specific, evocative, and palpable. Murano, as an island and historic center of creative production, where water and tides intersect work and play, serves as a perfect 'case study' location and typology in many ways.

The third key voice or player is the design and research work that is presented periodically through the text, and especially through the embedded images of the design work. The images contribute a particular voice and focused attention. They collectively share the individual acts of exploration, analysis, and synthesis of the themes, and of the design work within the *common* location of Murano. They provide a focused common point of reference and greater coherency.

Maybe they are a sort of visual anchor… or they provide visual markings, and a rhythmic beat for the chapter. They visually contribute to the investigation of the chapter, and towards a greater understanding and representation of how place, time, and presence may interact and become tangible. The design work was realized in a final graduate studio of the Interior and Spatial Design Master's degree program at Politecnico di Milano. Historical and present conditions were researched and explored (including direct, primary source research and experiences via site visits, interactions with glass foundry owners, workers, and the citizens), leading to particular proposals to stabilize and reverse declining trends, and enhance positive opportunities. This work was done analytical and creative work engaging various scales, processes, and typologies.

This included urban master planning at the larger scale, and specifically developed interventions at medium and smaller scales. At times, explicit 'touchpoints' were developed in a more comprehensive, rhythmic and tangible systems approach. New products were developed, along with new mobility and urban approaches. The work was inter- and trans-disciplinary, and included

urban, spatial, interior, landscape, graphic, product, system/service and environment/experience design. Ideas, strategies, and plans to create a more sustainable, progressive, open, and resilient Murano – and a future with creativity, innovation, entrepreneurship, well-being, and community at its core – were explored and manifested through the foundation of place – and time-based design.

However and importantly, this chapter's focus is not on that studio, nor teaching or education. The choice to use this work, rather than selections from established architects, designers, and artists is intentional, as stated above, and shall be touch upon through the development of the chapter, and within the final comments. And the final key voice or player is the co-authors of the chapter, acting as the collectors, conductors, and provocateurs that reveal and synthesize the voices and various elements.

They provide a degree of critical overview and coherency. Seeing, selecting, sequencing, applying hierarchy and volume are fundamental and transversal creative and critical acts. Perhaps like time itself, and certain approaches to time-based design, the chapter seeks a sort of sense of simultaneity and multiplicities, or of what might touch upon polyphonic and contrapuntal theories in music… a kind of nascent, polyphonic writing perhaps.

But, like the authors' voice, this is not the focus and is not incorporated heavily. T.S. Eliot calls for this sort of creative abstraction in authorship when developing the theme of the removal of the self (of the individual), and the importance of the focus on the work, when he writes:

What happens is a continual surrender of himself as he is at the moment to something which is more valuable.

There remains to define this process of depersonalization and its relation to the sense of tradition. It is in this depersonalization that art may be said to approach the condition of science. I, therefore, invite you to consider, as a suggestive analogy, the action which takes place when a bit of finely filiated platinum is introduced into a chamber containing oxygen and sulphur dioxide.

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The analogy was that of the catalyst. When the two gases previously mentioned are mixed in the presence of a filament of platinum, they form sulphurous acid. This combination takes place only if the platinum is present; nevertheless, the newly formed acid contains no trace of platinum, and the platinum itself is apparently unaffected; has remained inert, neutral, and unchanged. The mind of the poet is the shred of platinum. The emotion of art is impersonal. And the poet cannot reach this impersonality without surrendering himself wholly to the work to be done. And he is not likely to know what is to be done unless he lives in what is not merely the present, but the present moment of the past, unless he is conscious, not of what is dead, but of what is already living (Eliot, 1989, pp. 52, 54, 59).

The writing of the chapter tries to express and fully integrate these voices or players, interweaving them while trying to link their specific facets or contributions into a greater, collective whole and synthesis. Additionally, this chapter tries to move beyond time-based design paradigms, or ideas about time-based design, through the inclusion of design work that articulates or manifests time and time-based design in direct, palpable, and provocative ways.

In the Book of Tea, Kakuzo Okakura gives a settled description of the multi-sensory imagery evoked by the simple situation of the tea ceremony… In Okakura's description the present and absence, the near and the distance, the sensed and the imagined fused together. The body is not a mere physical entity; it is enriched by both memory and dream, past and future (Pallasmaa, 2005, p. 45).

7.2 Tradition and modernity + place and time

As an artist I frankly write about what I like in architecture: complexity and contradiction. From what we find we like − what we are easily attracted to − we can learn much of what we really are. Louis Kahn has referred to "what a thing wants to be", but implicit in this statement is its opposite: what the architect wants the thing to be. In the tension and balance between these two lines many of the architect's decisions (Venturi, 1966, p. 14).

A bipolar diagram, expressing the spectrum of positions regarding the continuity and development, or the fracture and rejection, of 'tradition' or 'modernity' represents a fundamental sense of time, place, and attitude. To place one's self in this spectrum, it is required to take a critical position, or at least an attitudinal approach,

concerning the relationships towards time in general, and specifically on the type of relationship existing amongst the past, present, and future. This representation of the interplay of history, heritage, tradition, modernity, transformation, innovation, and invention may embody of one of the essential creative paradigms, and one of the meta positions regarding the possible fluidity, interchange, and overlap of time, or of its confinement and segregation. The question of where each artist and designer positions himself or herself in this spectrum is fundamental. This fundamental issue of time and positioning is addressed in T. S. Eliot's seminal essay entitled *Tradition and the Individual Talent*, especially in his writings concerning the 'historical sense':

> …the historical sense involves a perception, not only of the pastness of the past, but of its presence; the historical sense compels a man to write not merely with his own generation in his bones, but with a feeling that the whole of the literature of Europe from Homer, and within it the whole of the literature of his own country, has a simultaneous existence and composes a simultaneous order. This historical sense, which is a sense of the timeless as well as of the temporal, and of the timeless and of the temporal together, is what makes a writer traditional. And it is at the same time what makes a writer most acutely conscious of his place in time, of his contemporaneity (Eliot, 1989, p. 49).

Eliot continues in the essay to note that to become a part of any discipline, one must become fully versed in that discipline, which is a very core idea of a 'discipline' and of a profession. All of this takes time and great effort, and it is also about a fundamental *understanding* of time. From his point of view, as well as the authors, the apparent domains of past, present and future are not so fixed or completely separated from each other… there are overlaps and interchanges.

> No poet, no artist of any art, has his complete meaning alone. His significance, his appreciation is the appreciation of his relation to the dead poets and artists. You cannot value him alone; you must set him, for contrast and comparison, among the dead… The existing monuments form an ideal order among themselves, which is modified by the introduction of the new (the really new) work of art among them. The existing order is complete before the new work arrives; for order to persist after the supervention of novelty, the whole existing order must be, if ever so slightly, altered; and so the relations, proportions, values of each work of art toward the whole are readjusted; and this is conformity between the old and the new (Eliot, 1922, pp. 49-50).

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Equally, it is vitally important to underline quickly and decisively the lack of blind or irrelevant adherence to the past, or to tradition.

With these relationships cutting across time, the relationship must be multidirectional, reciprocal, and open. So, for example, when Le Corbusier makes the Villa Savoye, the order of work (architecture in this case) shifts; the relationships, the positioning, rankings, and hierarchies of significance and contribution to the discipline adapt. And this is a continual phenomenon. The past shifts, and the future readies itself, due to an act in the present. Further, Eliot makes it clear that inappropriate conformity, or blind adherence to tradition and the past, would be a serious misstep for the creative.

> Yet if the only form of tradition, of handing down, consisted in following the ways of the immediate generation before us in a blind or timid adherence to its successes, "tradition" should positively be discouraged.
>
> …what happens when a new work of art is created is something that happens simultaneously to all the works of art which preceded it. The existing monuments form an ideal order among themselves, which is modified by the introduction of the new (the really new) work of art among them. The existing order is complete before the new work arrives; for order to persist after the supervention of novelty, the whole existing order must be, if ever so slightly, altered; and so the relations, proportions, values of each work of art toward the whole are readjusted; and this is conformity between the old and the new (Eliot, 1922, pp. 48, 50).

This overarching, primary idea of creativity over time, and of an ever-developing disciple and profession – of a body of work, theory and history – is not confined to Eliot. True creative work and significant authorship necessitate integrity and authenticity… as well as great effort needed to truly understand and respect the past, while one lives in the present, with an eye towards the future. This dynamic sense of time and work, and hence of place too, is also acknowledged by Norberg-Schulz:

> To respect to the *genius loci* does not mean to copy old models. It means to determine the identity of the place and to interpret it in ever new ways. Only then we may talk about a *living tradition* which makes change meaningful by relating it to a set of locally founded parameters. We may again remind of Alfred North Whitehead's dictum: "The art of progress is to preserve order amid change and change amid order". A living tradition serves life because it satisfies these words. It does not understand "freedom" as an arbitrary play, but as creative participation (Norberg-Schulz, 1980, p. 182).

To find the genius loci of a place, and then to understand it and work with it takes time and effort. Perhaps this is another reason why design work, and the engagement of its processes and products serve as excellent vehicles for research, as well as creative production.

Design here is a verb, it requires action, and therefore it requires direct and intimate engagement. It is also multisensorial and multivalent.

And, at least for the authors, it is best undertaken with a simultaneity of actions and issues, rather than a simple, linear progression. This complexity of issues, scales, and time allows many paths to open. It brings a dynamic sense of time and place and requires a very strong and sustained presence. Perhaps this liberal attitude towards time and place facilitated the research and design work that follows to also have the possibility to be woven into this chapter as a contributing voice, and in a relevant and revealing way that helps shift attention to more specific aspects and articulations of time and time-based design.

Threads: Co-dependency, co-production, transformation, landscape, natural and artificial systems, parks, gardens, and agriculture, greening, extension, growth, community…

Place and time merge strongly in the design proposal entitled Own Place. The research included first-hand, primary work attained by site visits, and by ongoing efforts to engage the inhabitants of Murano strongly and persistently. These efforts of engagement with the glass factories and the local citizens brought into focus the importance of co-dependencies and interrelationships amongst the furnaces, the community, and nature. The design work exploits the current waste of heat and energy being lost at the furnaces to create new and sustainable greenhouses and other initiatives to benefit Murano and its inhabitants, while also diversifying the business/production opportunities of the furnaces. This, and other designed initiatives located on the underdeveloped Sacca Mattia island, help to bring more nature, parks, and locally grown foods, plants and trees to green all of Murano over time, and to a foster a greater sense of community in Murano. Landscape architecture is inherently about time; it is a time-based discipline and profession. Plants and trees grow, and often transform

seasonally. The effect of the sun and seasons is profound on the landscape, and on people and places in general. More specifically, designed landscapes and gardens may have a built-in programming of natural, 'temporal rhythms'… such as the sequential blooming of flowers, the planned growth and transitions of plants and trees, the seasons of fruits and vegetables, etc.

Light is not only the most general natural phenomenon, but also the less constant. Light conditions change from morning to evening, and during the night darkness fills the world, as light does during the day. Light, thus, is intimately connected with the *temporal rhythms* of nature which form a fifth dimension of understanding. The phenomena which distinguish a natural place cannot be separated from these rhythms… The temporal rhythms obviously do not change the basic elements which constitute a natural place, but in many cases they contribute decisively to its character...

In general we have to emphasize that *all places have character*... To some extent the character of a place is a function of time; it changes with the seasons, the course of the day and the weather...   (Norberg-Schulz, 1980, pp. 14, 32).

Gardens are fundamentally human constructs in close relationships with natural materials and processes. They also make us aware of time, and perhaps our lives, being cyclical rather than simply linear. Natural cycles and rhythms are more noticeable, and a part of our lives. *Own Place* brings these facets into play for the inhabitants at social and community levels in parks and gardens, and at the scale of agricultural production in two ways: of trees and plants to achieve the 'greening' of Murano, and in terms of 'consumption' at new local markets with locally grow produce via new community gardens and larger scaled production.

The weakening of the experience of time in today's environments has devastating mental effects. In the words of the American therapist Gotthard Booth, "nothing gives man fuller satisfaction than participation in processes that supersede the span of individual life". We have a mental need to grasp that we are rooted in the continuity of time, and in the man-made world it is the task of architecture to facilitate this experience. Architecture domesticates limitless space and enables us to inhabit it, but it should likewise domesticate endless time and enable us to inhabit the continuum of time (Pallasmaa, 2005, p. 32).

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Fig. 33 - Factory and greenhouse addition

Fig. 34 - Greenhouse interior

What, then, do we mean with the word "place"? Obviously we mean something more than abstract location. We mean at totality made up of concrete things that have material substance, shape, texture and color. Together these determine an "environmental character", which is the essence of place (Norberg-Schulz, 1980, pp. 6-7).

Fig. 35 - Greening of Murano phasing diagrams

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Fig. 36 - Community park – greening of Murano + extension of water

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Images retrieved from the student's project:
Own Place, a smarter, greener future.
In their abstract they stated: "Own Place is where you feel at home. It is where you are free to be yourself. It is comfortable, welcoming and made by the community. You always take care of it. Own Place Murano gives a new social role to glass companies: cooperating, they will become first actors in the environmental improvement of the island. In the new eco - sustainable Murano, CO2 emissions are reduced, the water is clean, the electrical energy drives boats and the quality of locals' life gets better every year".
Students: Berilsu Cambaz, Aysu Kucuker, Ilaria Odoli, and Sara Valassina.

Threads: Water and landform, island, tides, layering, patina, transformation, new urban typologies, memory…

Murano is a 'true' island still. You cannot arrive to Murano in a car, bus, or train. You can only arrive onto Murano by the water that surrounds and defines it. This is an important and fundamental characteristic of an island. Its disconnection reinforces an essential characteristic, and an overriding sense of it as a place. Norberg-Schulz, like Lynch, highlights the importance of boundaries (edges) in the definition of place; and he writes "In the boundary, thus, character and space come together" (Norberg-Schulz, 1980, p. 15).

Venice, instead, has become more like a peninsula due to its direct connectivity to the mainland of Italy, and the way those 'land-based/bridged' connections are made. One only arrives and leaves Murano via private boat, water taxi, or the public transit 'vaporetti' system. Norberg-Schulz underlines the important of water and landform in the creation of place, especially in the case of an island.

But water also generates particular kinds of spatial configurations: island, point, promontory, peninsula, bay and fjord, all of which must be counted among the most distinctive natural places. The island thus, is a place *par excellence*, appearing as an "isolated", clearly defined figure. Existentially the island brings us back to the origins; it rises out of the element from which everything was originally born. The word "peninsula" means "almost an island" and thus language expresses an important spatial structure (Norberg-Schulz, 1980, p. 39).

Water, and specifically the tides and increasing sea level changes attributed to climate change, were the most influential elements of the research and design studies for the design project entitled "Fenice". Murano had record setting flooding (second highest reached in recorded history) that was particularly violent and influential. Also,

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the new "technological" system called MOSE (Modulo Sperimentale Elettromeccanico) that had been planned to resist increasing high tides and sea levels on the islands in the lagoon was still not functioning after years of construction and ongoing, large financial investments… and it will likely always have its vulnerabilities. Both factors were influential during the timeframe of the design work shown here.

Fenice takes an alternative direction and attitude towards nature. The project investigates, and the images articulate, what would happen if we stopped fighting nature, and allowed nature, and natural systems, to be a core aspect of living, and of design. This manifests in large-scale urban acts and in small details. For example, at the smaller-scale, the ebb and flow of the seawater also manifests itself in a material and visceral sense with the high-water levels becoming traced onto the corten steel at various locations in the project. Therefore, the sense of time and movement is always present and apparent.

This sense and presence of time exists in the built environment, and the degree of that sense and presence may be conscious and controlled depending on the intention, awareness, understanding, and ability of the designer, artist, or architect. Juhani Pallasmaa's speak directly to this opportunity when he writes about materials and their relationships to time.

Natural materials – stone, brick and wood – allow our vision to penetrate their surfaces and enable us to become convinced of the veracity of matter. Natural materials express their age and history, as well as the story of their origins and their history of human use. All matter exists in the continuum of time; the patina of wear adds the enriching experience of time to the materials of construction.

Buildings of this technological age usually deliberately aim at ageless perfection, and they do not incorporate the dimension of time, or the unavoidable and mentally significant processes of aging. This fear of the traces of wear and age is related to our fear of death (Pallasmaa, 2005, pp. 31-32).

The use of the corten steel establishing the traces of the water levels changing over the years and makes time evident in the design project and in the lives of the residents and visitors to Murano. It enriches their experience and understanding of both the specificity of place, and their place in the broader context of life, history, and time.

In English, 'Fenice' translates to 'Phoenix'… the Greek/Egyptian mythical bird that symbolizes rebirth or renewal. In this context, we may say that it represents a new future for Murano, a sort of progressive and transformative renaissance born out of a paradigm shift that seeks continuity with the past, and a new vision and form for the future, while fully informed by the present.

At the urban scale, the decision to work with nature – the fundamental paradigm in history – resulted in the need to re-think the city and the urban experience in Murano. Projected water level increases result in the almost continual submersion of the current ground floor of the island-city. Tidal fluctuations bring increased variations to the presence of water, and the marking of time. This results in the needed transformation of the layers of Murano, and exposes the theme of 'layering' as a principle articulation of time and time-based design. Further, the new, upper Murano, inspired to initially compensate for the 'loss' of what was known as the 'ground floor' – which becomes known as the 'water floor' – takes its urban orientation from the direction of the prevailing winds. This orientation was apparently the initial urban orientation for Murano, and may have assisted in the evacuation of water from the city with the help of the natural air currents.

So, we may have, in a sense, a *return* to a formal aspect of the *genius loci* of the place. And also, what may initial be seen as a radical proposal to build this new Murano onto the existing city, may not ultimately be seen as so 'new' or 'radical' when placed in a more reflective, and broader, sense of time. Isn't 'layering' a consistent urban, and natural, process? Haven't we, literally, as in this case and others, been building upon previous conditions, and civilizations, since the development of human settlements?

'Layering' is inherently an action, or process, that involves time. In nature, that timeframe may be quite long, as in geologic layers and geologic time, or rather quick, as in a volcanic eruption. It can be 'permanent' and very visible, such as the stratification in sedimentary rocks, or fleeting as in snowfall. The range and impact of the temporal aspect of time itself, and of 'natura' and 'artificial' processes and events, is wide and varied.

These themes can also appear in simple, quotidian objects… such as the new line of bottles produced by the glassmakers of Murano.

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They become portable memory icons that underline the gains and beauty discover by working with nature and with the patterns of time.

Or, maybe they are just simply beautiful bottles to be used in daily life that may occasionally bring a smile.

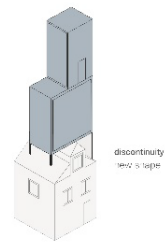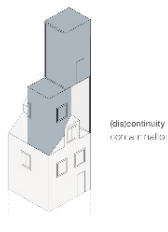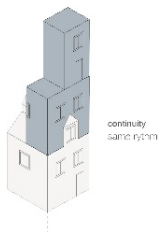Fig. 37 - Approacing the new Murano + future masterplan
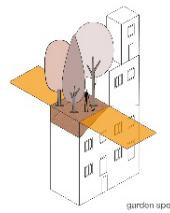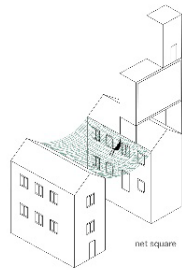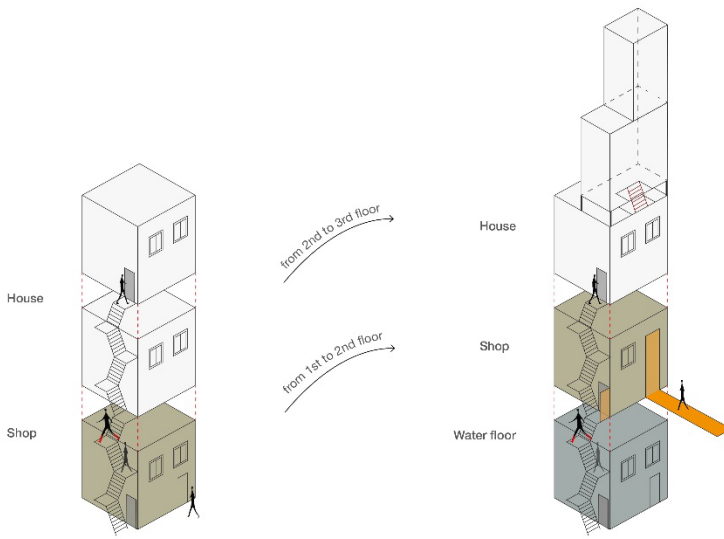
Fig. 38 - New urban form – dist
Fig. 39 - Existing urban form – new urban form (with water floor)

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Fig. 40 - Fenice canal view - day

If the environment is visibly organized and sharply identified, then the citizen can inform it with his own meanings and connections. Then it will become a true place, remarkable and unmistakable (Lynch, 1960, p.92).
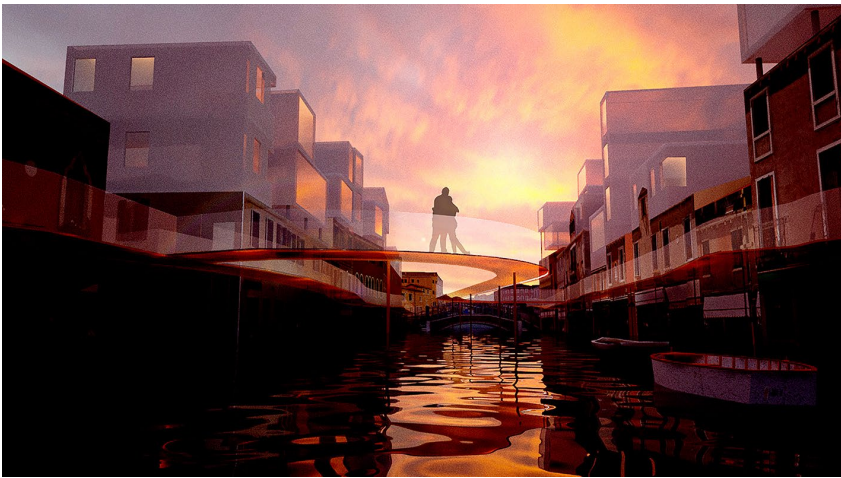
Fig. 41 - Fenice canal view – night
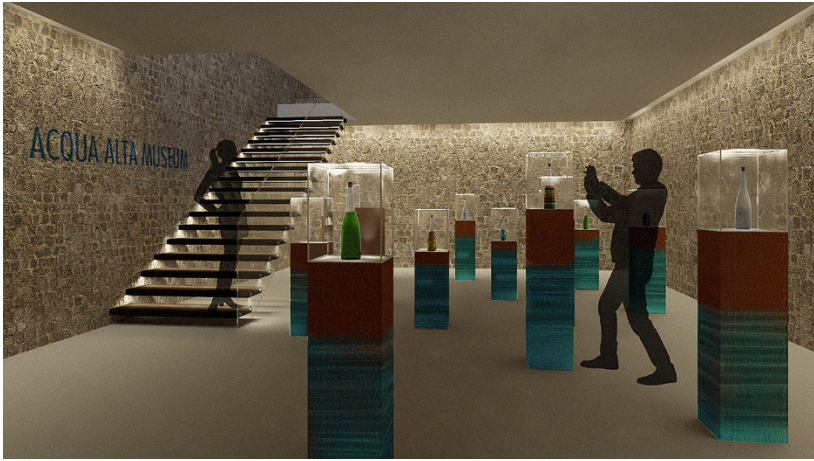
Fig. 42 - Fenice waterfloor interior – wet
Fig. 43 - Fenice bottles – new urban product
Fig. 44 - Fenice waterfloor interior – dry

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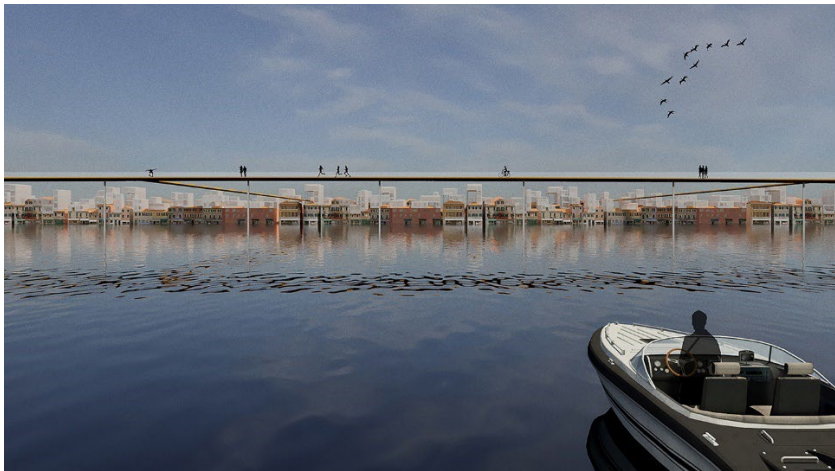
Fig. 45 - Fenice landart – internal view
Fig. 46 - Fenice overview from lagoon

Images retrieved from the student's project:
Fenice, towards a new rise, In their abstract they stated: "Fenice is what Murano needs right now. Due to climate change, the island is going to be underwater by 2100. The project starts from the idea that it is possible to coexist with water by leaving it its vital space. It determines the shift of the old city of Murano in height, creating new layers. This departure from water defines a reversed reality where people walk on the existing roofs and enter their houses from above. However, the connection with water is preserved through the 'water-level' and a land art installation. The former features different experiences to get people in touch with the ancient Murano. The latter aims to show that water needs its space and that it has to be respected".
Students: Cristina Brena, Martina Gorio, Mauro Magarelli, Samane Qashqaei

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Threads: Installations, movement and motion, perspective, sequencing, rhythms, systems…

Perception, perspective, sequencing, rhythms, movement, and motion are fertile threads and formal manifestation or opportunities when working with time-based design. These possible strategies and tactics become more noticeable and understandable through a series of built installations in the design work entitled Encoding. The movement and motions of water passing by, perhaps from a natural current, or from the wake of a passing boat… or from the rising and falling tides… or from the wind, the sun, the moon… or from reflections in the water or other materials employed… or from the window on a passing train heading to Venice… inspired and informed the research and design work.

The specific installations are precise in their intentions, placement, and configurations. Some relevant details that may contribute to the interweaving of ideas and applications include material, performative, and conceptual aspects. For example, SLOW is positioned to welcome arrivals to Murano on the vaporetti system, and while it plainly communicates the fundamental concept of the design project, it can only be clearly legible from a specific vantage point. Formal articulations of time-based design include the varying tidal levels obscuring or revealing the text, and, materially, its mirrored front providing ever-changing images and reflections. The kinetic planar wall of Komorebi is composed of colored Murano glass tiles that move by the winds and water, its actions over time also remind us of forces beyond us. The most distant installation from Murano is Shouganai, and while it shares many attributes with SLOW, it is more abstract, and perhaps serves as a kind of distant outpost or moon for Murano, as marker in the lagoon for travellers in boats, and as an opportunity for glimpses of Murano for those in passing trains to and from Venice.

These 'melodic' installations are subtlety centralized by a specific charged experience through Kalpa, a kind of human meridian, linking the individual to the collective and the cosmos, and the parts to the whole. Kalpa is located by the cemetery, and is the formal center point of the installation system… a system, or constellation, of installations orbiting around a central point that can be occupied by a person. It reinforces the concept of 'slow time' by not proving precise information on actual, normative time. These installations may be best

woven into an except from Lynch that describes two basic modalities of serial elements in time. The passage presents the idea of a 'simple' and 'melodic' sequence regarding episodic, time- and place-based work. The installations in Encoding present a more melodic approach, while the path in Novo Ridotto, the next design project, may appear to be more of a 'simple' sequence.

> *Time Series*: Series which are sensed over time, including both simple item-by-item linkages, where one element is simply knitted to the two elements before and behind it, and also series which are truly structured in time and thus melodic in nature (as if the landmarks would increase in intensity of form until a climax point were reached). The former (simple sequence) is very commonly used, particularly along familiar paths. Its melodic counterpart is more rarely seen, but may be most important to develop in the large, dynamic, modern metropolis. Here what would be imaged would be the developing pattern of elements, rather than the elements themselves, just as we remember melodies, not notes. In a complex environment, it might even be possible to use contrapuntal techniques: moving patterns of opposing melodies or rhythms. These are sophisticated methods, and must be consciously developed. We need fresh thought on the theory of forms which are perceived as a continuity over time, as well as on design archetypes which exhibit a melodic sequence of image elements or a formed succession of space, texture, motion, light, or silhouette (Lynch, 1980, pp. 107-108).

Lynch is correct that such work is full of opportunities for both place- and time-based design, and that additional "consciously developed" work is needed with new and open-minded thinking… and here we also quietly and quickly add 'design and creative actions' to the call for thinking.

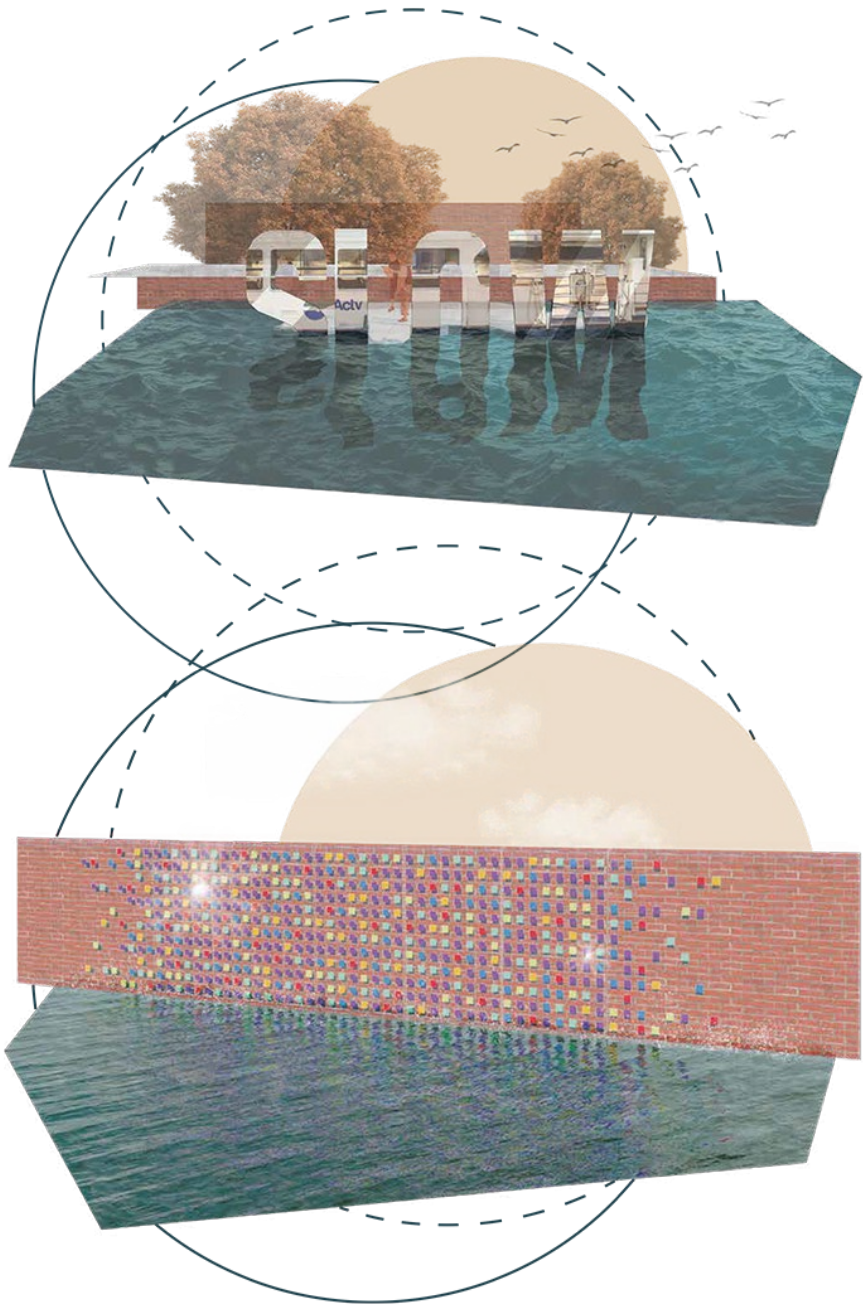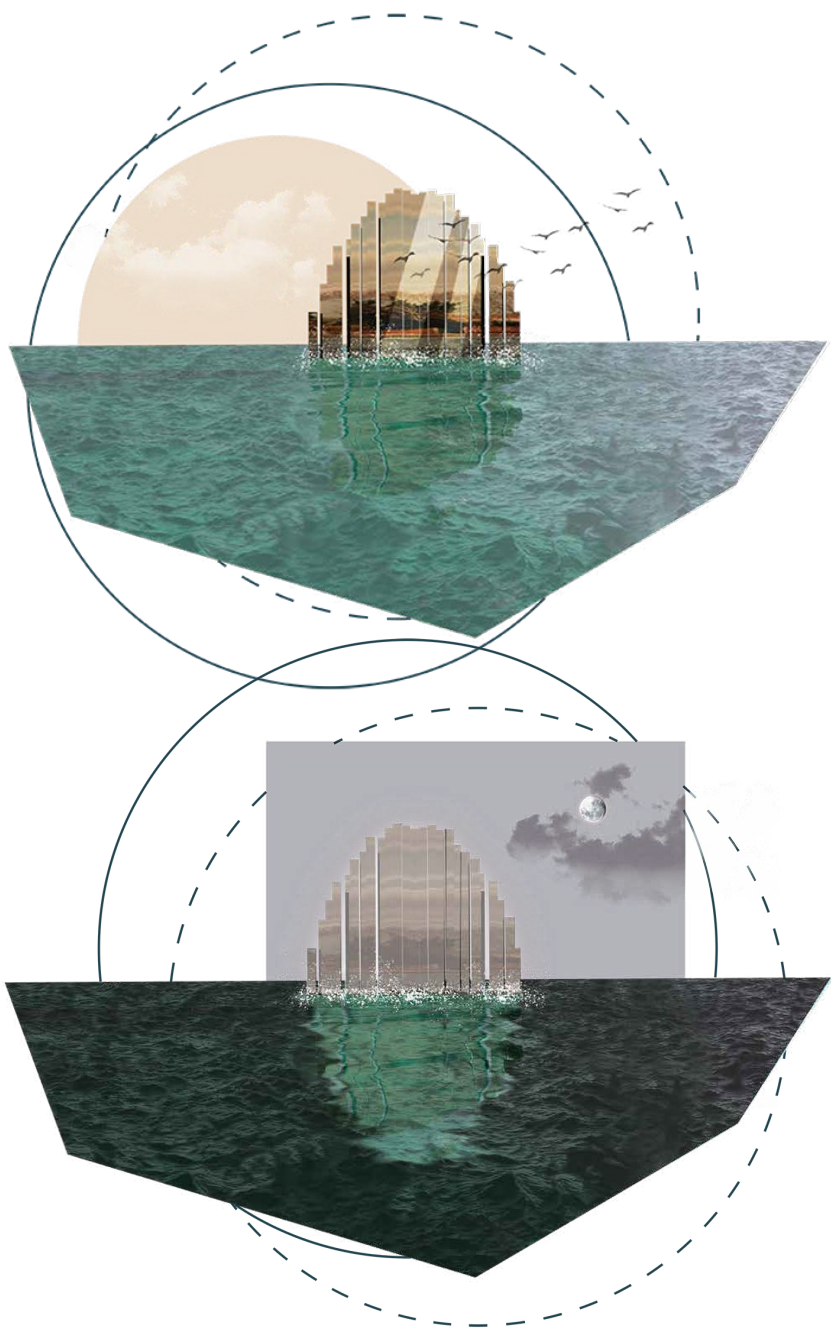*Fig. 47 - Slow and Komorebi (walls) Installations*

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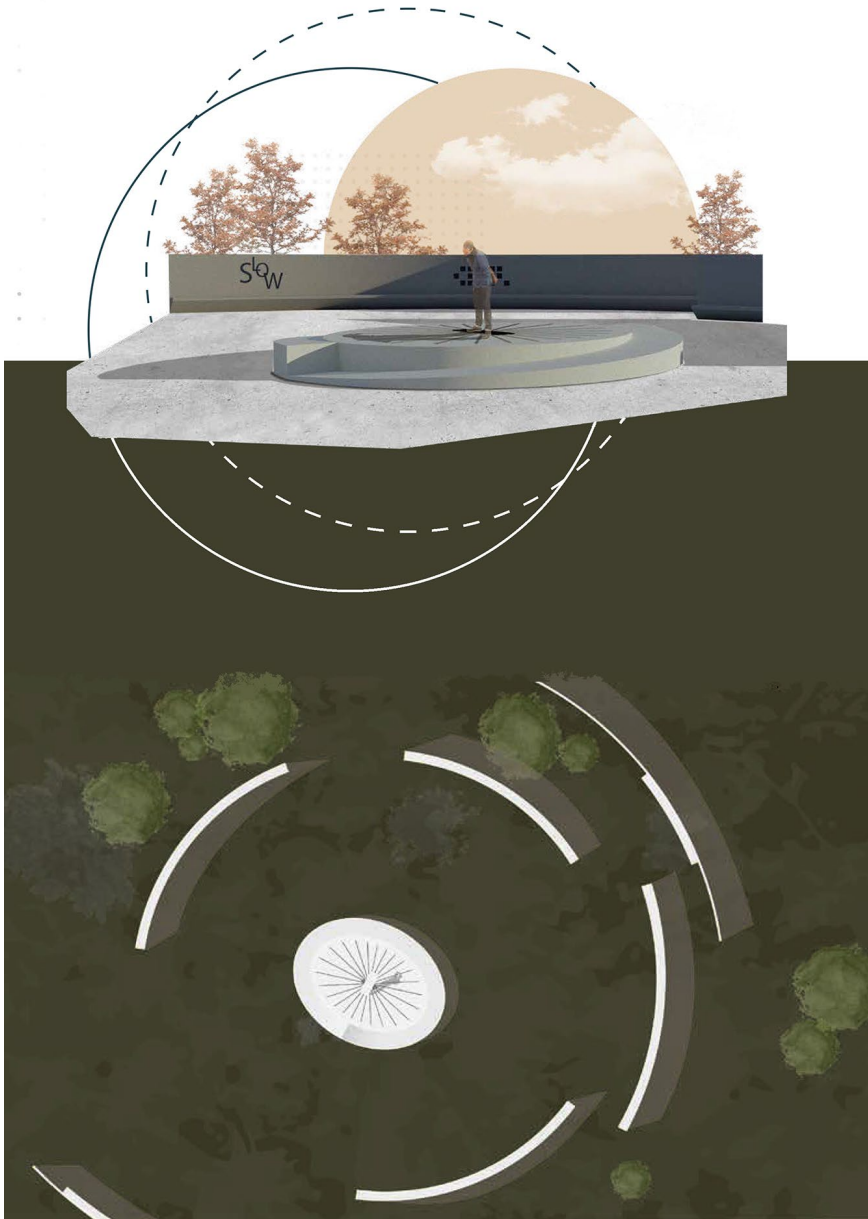*Fig. 48 - Shouganai (mirror) installation day and night*

Fig. 49 - Kalpa (meridiana) Installation – with a person and plan

Threads: Sequencing, memory, ritual, transformation, community…

We must immediately recall Lynch's excerpt on "Time Series" quoted above; he wrote that "Series which are sensed over time, including both simple item-by-item linkages, where one element is simply knitted to the two elements before and behind it, and also series which are truly structured in time and thus melodic in nature (as if the landmarks would increase in intensity of form until a climax point were reached)" (Lynch, 1960, p. 107, emphasis added by authors).

While the principal path presented in Novo Ridotto may appear to be within the typology of a "simple sequence", the overall transformative sequence of the experience, including its 'starting' and 'culminating' points, seem more aligned to a melodic sequence. We must be careful of appearances and quick assumptions, and in either case, the path from the new campo created to the new thermal bath is anything but simple. The project employs time in many ways. In the new campo, the community has a place to gather and spend time together.

They can simply watch people bringing their small round glass balls, called 'doni' and which have been produced in the furnaces of Murano, for placement into the water basin of the campo. They know that this is the first step of the ritual that will transform those who enter into the path towards the thermal bath.

This path is punctuated rhythmically by arches, that also act as thresholds, and that provide heat from the furnaces in the colder months, and a cooling mist or ice layer for cooling in the hotter seasons. There are 'lockers' and places to disrobe (*devestitio*) and

leave your normal possessions while picking up the minimal essentials for the baths ahead. This slow, and gradually mounting experience allows time for, and prompts, the transformative ritual of removal, cleansing, relaxing, and regeneration. The apex is found in the Nudity Gallery where all is removed, and one is reminded of beauty in nature and across time. Eventually, one may collect a donum for another time, or for a memory.

Novo Ridotto researched the history, community, and physical context of Murano deeply, which allowed an evocative and responsive proposal to conditions and opportunities to emerge. It brings new life and new rituals, steeped in the past, and in memory, to the present and future of Murano. It strengthens community, renews an abandoned furnace and declining neighborhood, and provides a memorable, transformative experience for residents and visitors. Novo Ridotto's flexibility, transferability, or transgressions in and of time, present a dimension of work not typically seen in contemporary work. The blending, blurring, and merging of time and place through the use of historical figures allow for a provocative jolt to the present and to memory; and speak to a radical and conceptual shift of time in the guise of tradition. It allows the mind to wander and consider time-travel, or how one can travel in time, as well as in place. It is also strange, and at least somewhat magical, when there are coincidences and overlaps that resonate deeply, and bring a sense of both clarity and wonder, such as the following quote by Pallasmaa.

> The incredible acceleration of speed during the last century has collapsed time into the flat screen of the present… As time loses its duration, and its echo in the primordial past, man loses his sense of self as a historical being, and is threatened by the "terror of time". Architecture emancipates us from the embrace of the present and allows us to experience the slow, healing flow of time. Buildings and cities are instruments and museums of time. They enable us to see and understand the passing of history, and to participate in time cycles that surpass individual life.
>
> Architecture connects us with the dead; through buildings we are able to imagine the bustle of the medieval street, and picture a solemn procession approaching the cathedral (Pallasmaa, 2005, p. 52).

In their direct research including observations and conversations, and reinforced by secondary and tertiary research (the 'Ridotto' was a place where people would gather and spend time together),

opportunities were found that could be addressed through a multi-layered design and provocative images, and that would bring about positive ecological, economic, social, and cultural results.

Threads: Circular economy, circular time, geometry, movement, motion, mobility, waste, research, innovation, part and whole, aggregation, services, systems…

N.E.M. (New Ecosystem of Murano) creates a new hybrid geometry for the expansion of the city based on the foundation of the existing geometries discovered in the analysis of the islands.

It also uses the existing waste and debris of Murano to create innovative new products, new research activities, and a new research and educational district. Murano becomes something like a city found in Calvino's Invisible Cities.

It creates its own future from the rubble and detritus of its present and past conditions… ever changing, developing, growing, producing, and reproducing in new and innovative ways, including new circular economies… and perhaps a new sense of circular or spiral time. Motion is prevalent, and the world, with perhaps you on it, floats by, in new and non-linear ways.

We are presented with not only a new ecosystem, but also new systems and services for living, working, creating, playing, and relaxing.

Figs. 50 and 51 - New communal Campo and entry to the path of the Thermal Bath

Figs. 52 and 53 - Path to the Thermal Bath and points of exchange / transformation

Figs. 54 and 55 - Thermal Bath - Nudity gallery and "Doni" collecting place.

Images retrieved from the student's project:
Novo Ridotto. Create new rituals
In their abstract they stated: "The aim of Novo Ridotto is to create new rituals, both sacred and profane, as the real soul of Murano; to stimulate people to get rid of their ordinary life, opening to a new extraordinary possibility, in order to build the sense of community between inhabitants and tourists. In this gradual intensification of the experience people become lighter and lighter, starting with a mental purification that leads to a process of physical purification, which ends in the Thermal Bath, located in the renewed abandoned furnaces in the promontory of the island. Guests get closer and closer to their own and others' nudity, meant as a celebration of nature, beauty, and art. Novo Ridotto wants to offer an experience to visitors and to inhabitants to rediscover their own fragility and sensitivity, contributing to grow a profound sense of community".
Students: Elnaz Amiri, Sofia Dalmonte, Alice Lonardi, Sabina Elena Quocchini

As Lynch's 'Time Series' quote expressed a theme that was woven into more than one instance of articulation through design work, so too does his quote on the possible motion of city elements, of mobility through the city, and participation.

Moving elements in a city, and in particular the people and their activities, are as important as the stationary physical parts. We are not simply observers of this spectacle, but are ourselves a part of it, on the stage with the other participants. Most often, our perception of the city is not sustained, but rather partial, fragmentary, mixed with other concerns. Nearly every sense is in operation, and the image is the composite of them all (Lynch, 1980, p. 2).

As we see from the images of N.E.M., the continually produced platforms join the vaporetti and other boats and barges in the water-based system of movement around and through Murano. The new platforms also carry people and goods, but they also provide new services, carry new ideas, and create new urban forms and districts.

They are a mobility of ideas and experiences, allowing the body and mind to wander over place and time. They offer an intellectual and conceptual mobility.

They are innovative, made of waste, and intended to help generate a new Murano, with new parades, parties, and rituals… and new forms of production and consumption. And perhaps they offer a new sense of time. We pass into Norberg-Schulz again and find within his writings, interwoven with Heidegger, the fundamental importance of *things* and *making*.
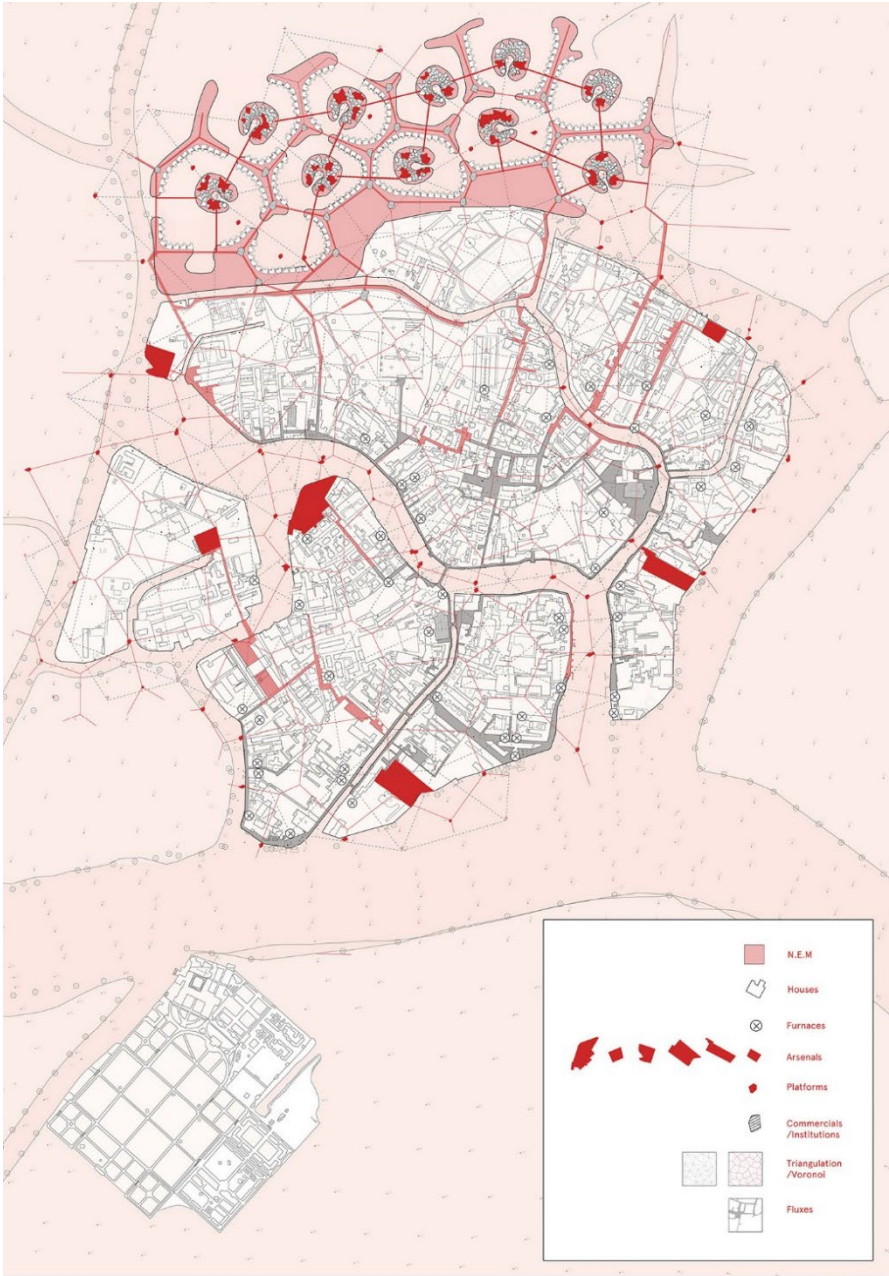
To fulfill their function, these spaces ought to contain all those "things" (buildings, monuments etc.) which make manifest the meanings gathered by the place. Thus Heidegger says: "…the things themselves *are* the places, and do not only "belong" to a "place".

We have to be able to "see" the meanings of the things that surround us; be they natural or man-made. Things always tell several stories; they tell about their own making, they tell about the historical circumstances under which they were made, and if they're real things, they also reveal truth. The ability of a thing to reveal truth depends upon how it is made, and the next thing to learn is therefore *making*. Seeing and making are united in inspiration and concretization. Thus, Louis Khan said: "Inspiration is the moment of possibility when what to do meet the means of doing it" (Norberg-Schulz, 1980, pp. 176, 185).

The platforms and their systems provoke additional possible themes, and touch upon foundational design principles and basic principles and processes in urban design. The platforms can be viewed as a unit, as a part to the whole. This brings us to the process of aggregation… to grouping, collecting, and assembling over time… to growth. We see from the diagrams that follow that the platforms, the units and parts aggregate to form a new whole. Hence we have a direct relation of part to whole, and a continuum of creation. Like layering and stratifications, and other themes and processes explored, this is not so 'new' either; rather it is a common pattern and process. One can think of the beehive in nature, for example, and early Roman town planning where the courtyard housing, with its solid perimeter and central void is basically the same as the urban block, and as the void of the piazza is similarly formed by the mass of the blocks creating its perimeter. There is a continuum, a pattern, system, and rhythm. We are reminded again of Lynch's mention of the relationship between notes and melodies when he wrote above that

we remember melodies, not notes (Lynch,1960, p. 107).

but, of course, we would not have melodies without notes.
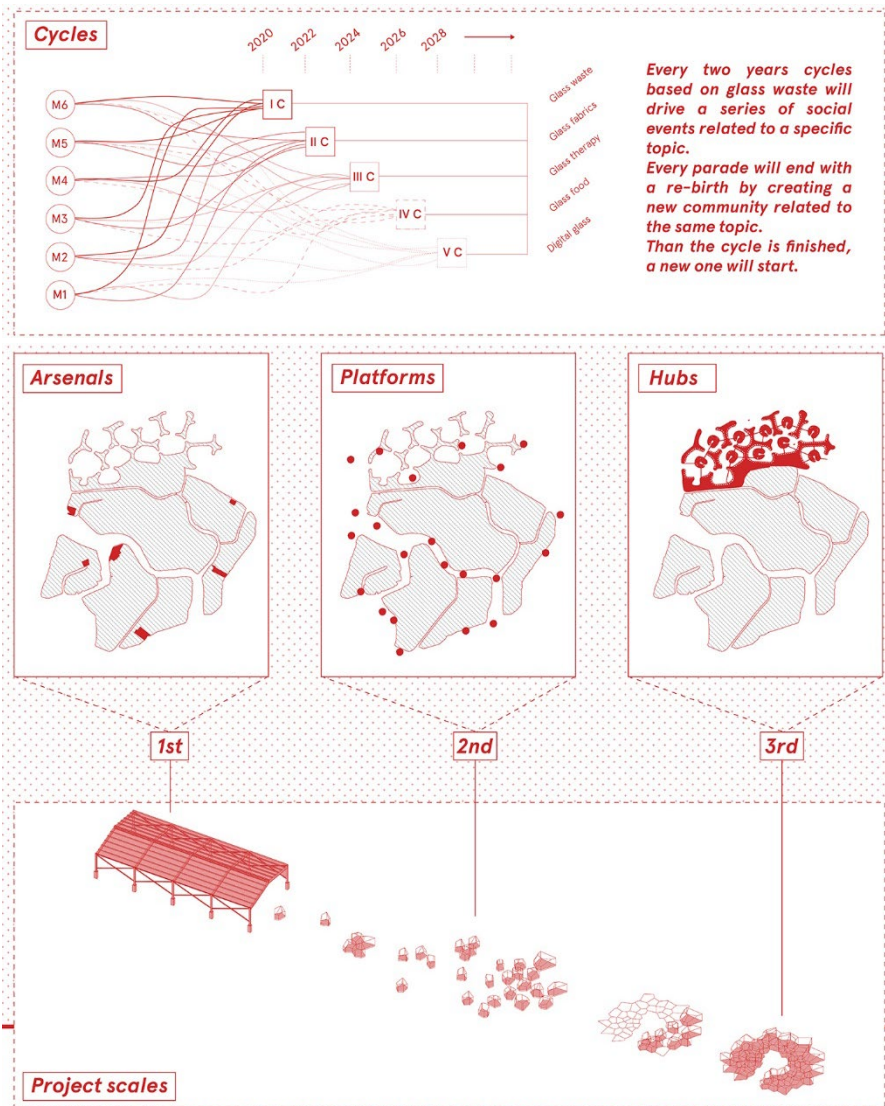
Figs. 56 - NEM masterplan

Fig. 57 - Phasing and cyclical diagram

Within the figure:

Cycles

2020 2022 2024 2026 2028 →

M6, M5, M4, M3, M2, M1

I C, II C, III C, IV C, V C

Glass waste, Glass fabrics, Glass therapy, Glass food, Digital glass

Every two years cycles based on glass waste will drive a series of social events related to a specific topic.
Every parade will end with a re-birth by creating a new community related to the same topic.
Than the cycle is finished, a new one will start.

Arsenals

Platforms

Hubs

1st 2nd 3rd

Project scales

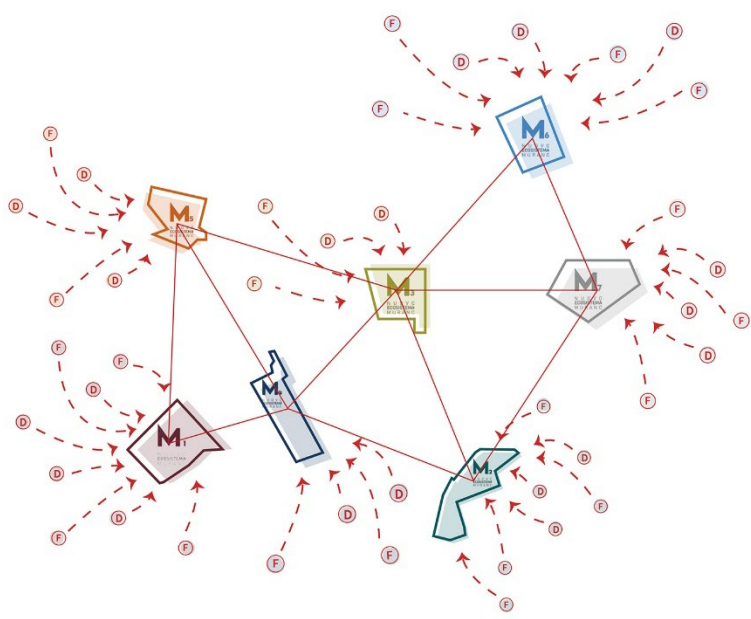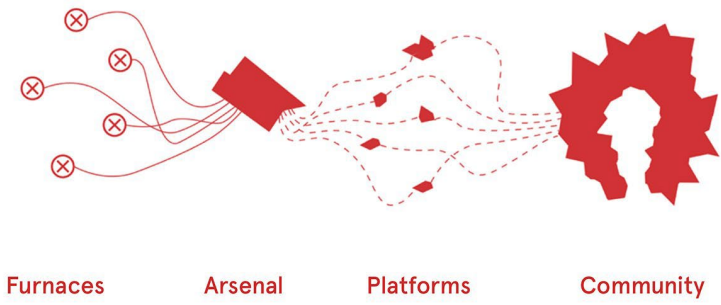Furnaces   Arsenal   Platforms   Community

Fig. 58 - New Urban components and aggregate forms
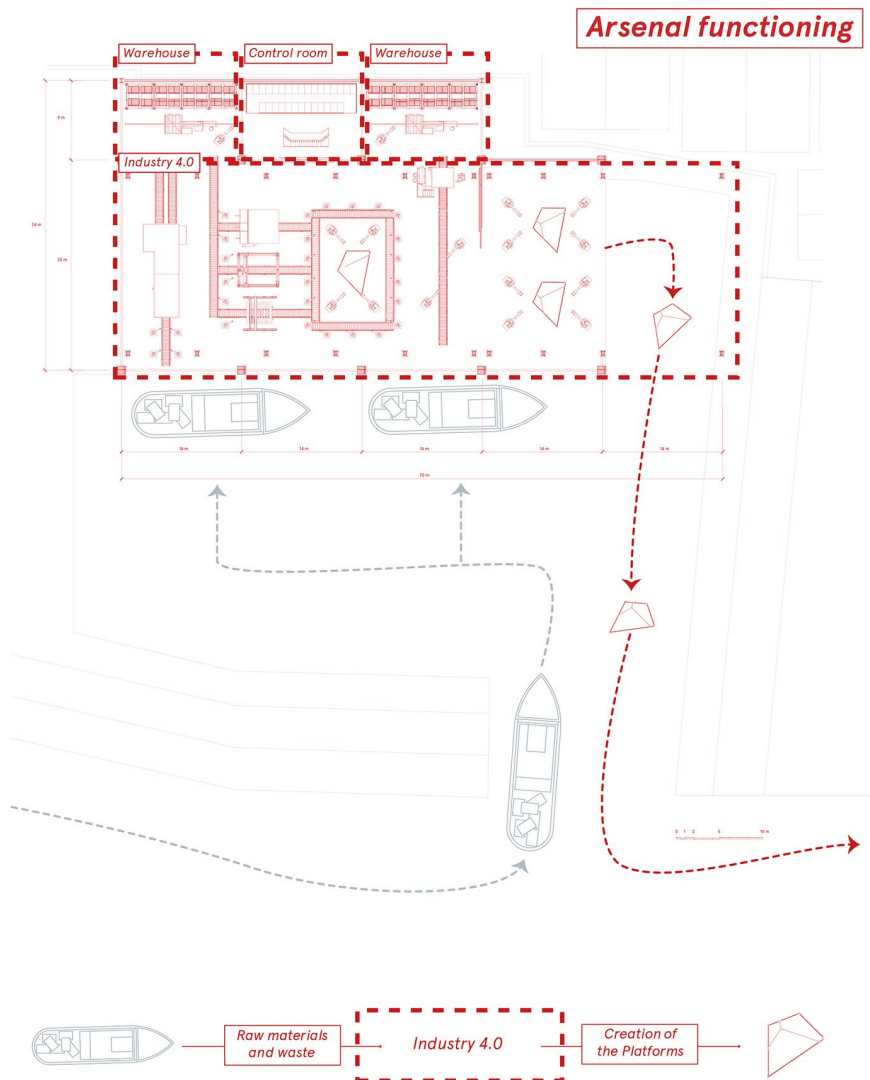*Fig. 59 - Parts to whole and aggregation diagram*

Fig. 60 - NEM arsenal recycling and production diagram

Fig. 61 - NEM platforms - day
Fig. 62 - NEM platforms - night
Images retrieved from the student's project:
N.E.M. New Ecosystem of Murano
In their abstract they stated: "Designers and furnaces collaborate together in a 4.0 industry setting up floating platforms for temporary events to create glass waste products. These platforms will be connected to build up advanced research hubs and new communities in order to establish a circular economy for the new ecosystem of Murano".
Students: Mattia Barrile, Giovanni Bettinelli, Andrea Escudé, and Simone Salcuni

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Denouement

'What does 'tame' mean?' (asked the little prince)
'It is something which is too often forgotten", said the fox. "It means to establish ties..".
'One can only understand the things that one tames,' said the fox.
(Saint-Exupéry, 1943, pp. 76, 78).

… we need an environment which is not simply well organized, but poetic and symbolic as well. It should speak of the individuals and their complex society, of their aspirations and their historical tradition, of the natural setting, and of the complicated functions and movements of the city world. Such a sense of place in itself enhances every human activity that occurs there, and encourages the deposit of a memory trace (Lynch, 1960, p. 119).

The chapter has tried to interweave ideas, themes, and images into an exploration of place, presence, and time. Time and 'time-based design' have been *present* in research and design work by the chapter authors over many years, and have been discussed in countless studios and projects. But, with the *focus* on time-based design and time-based paradigms by the book editors, things have shifted, and a more precise point of view was embraced by the authors. This prompted a fresh review of some of the seminal texts by authors on place, environments, and design… and time. However, it should be clearly stated, that the vast majority of quotations used here are being used for the first time in this chapter by the authors. Of course, they existed in the original pivotal texts, but they were hardly the focus of them, their bias was towards place and other things. So, the chapter authors did not come to the texts with the same perspective. The shift of perspective, with a bias towards time, facilitated the excavation of the texts and the 'finding' of the quotations. The texts include some significant nuggets on 'time' as well; but these jewels are somewhat scattered about, and typically overwhelmed by the focus on place and presence. You have to be looking for them, and have a place for them, a relationship, ties… they need to be tamed.

It seems that there were maybe three 'taming' devices and processes. The imposed focus of the book, Murano, and the design work of the students from the studio in general, but specifically and importantly, from their images. The images provided the clearest and

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sharpest focus in the rereading of the seminal texts. They helped tame the texts, and assisted the authors of the chapter to find quotations linked to the articulations of the images.

This is also why it is important to use the work from the studio in this chapter. To begin with, it is respectful to that work, and acknowledges the work. It is also an act of honesty and transparency.

The students' images and the work of the studio informed the making of this chapter[1]; and the authors of the chapter learnt things from the studio and Murano along with the students. And, as previously mentioned, the studio work and these images, contribute an inherent relationship to Murano and the interweaving being attempted here. But also very importantly, the studio work and images provided a limited boundary and scope for the chapter. Like an island, like Murano, its boundary is critical to its definition and focus. The studio work and images created a focused context for the chapter, and for the first step in this more structured and constructed exploration of time.

Of course, this chapter is not a book, and so, some constraints and limitations are important. If we go beyond the bounds of the work from the studio, we can start to discuss the palimpsest and the Japanese technique of kintsugi, where gold is used to mend a broken object. Both of these have strong and important histories and meanings; and both are incredibly beautiful and visually rich. And both have broad application, and in fact have been used in design and studio work by the authors previously. This touches on the future, as well as the past.

A following next step from this chapter is to further excavate this work and include a broader domain to create a more comprehensive and structured exposition of time-based design. This has been slightly initiated in this chapter with the inclusion of the 'threads' above, and as only an early, minor step. A more comprehensive publication could also include a specifically designed matrix that could organize, classify, and cross-reference the types and characteristics of themes

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1. In fact, the studio had the working title of The Place of Glass_Murano: Past_Present_Future. The faculty included Frank Clementi, Barbara Di Prete, Peter Di Sabatino, and Monica Mazzolani. The teaching assistants included Althea Gailli, Nicoletta Intrepido, Claudia Mastrantoni, and Savina Radeva. We were assisted by Christian & Maurizio Mussati, the founding partners of WonderGlass, and our collaborators who introduced us to several key people and businesses in Murano.

and manifestation. The matrix becomes a sort of periodic table for time and time-based design. Perhaps it also becomes organized in terms of ideas/paradigms, themes, strategies, tactics, and techniques. The authors directed the creation of a matrix for the conclusion of a five-day workshop a few years ago. It not only helped bring the individual group work together as a collective image of the intensive workshop, but it organized and collated the work in a systemic way.
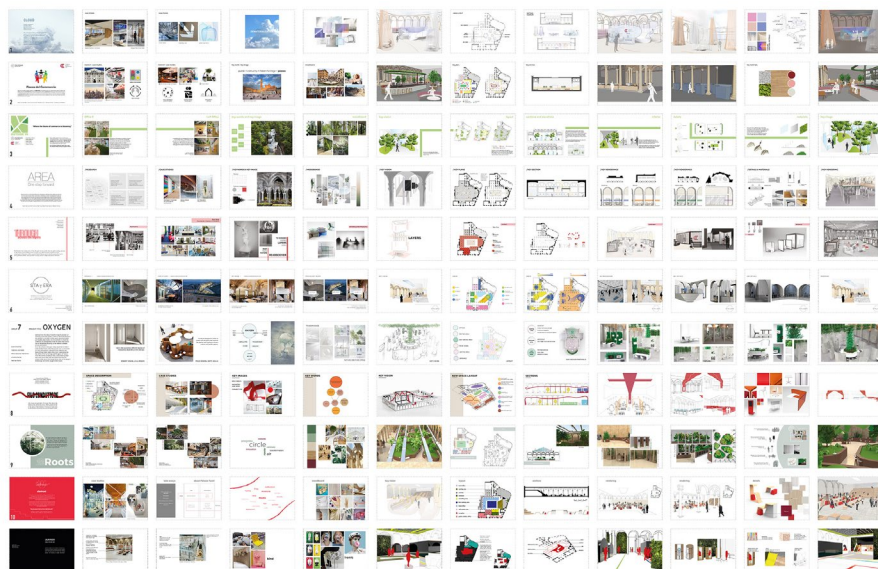

Fig. 63 - Studio Matrix from PSSD design workshop, 2019: Salone Del Futuro - Connecting Commerce; Palazzo Turati, Milan. (Di Sabatino, 2020, pp. 347-349)

The design work from the studio that is included here is also linked to the LEM (Landscape, Environments, and Mobility) section of the Design Department at Politecnico di Milano. Ultimately, the work and images touch upon all of the facets of the Department at the School of Design, and hopefully this will also amplify the possibilities of incorporating the opportunities of time-based design further into our fabric and work. As the book editors mention in their abstract, there seems to be a gap of focused explorations.

Fig. 64 - Studio Matrix from PSSD design workshop, 2019: Salone Del Futuro
- Connecting Commerce; Palazzo Turati, Milan. (Di Sabatino, 2020, pp. 347-349)

And lastly, this all circles back to design itself, and its recognition, understanding, and valuation. As mentioned in the abstract, this brushes up to ongoing discussions and perspectives about the relationship between design and research, and about the often agreed upon, but hardly universally accepted, positions that support "design as research and research as design" and that scholarship, in the academy and beyond, includes both research and creative work. And while this is not the focus of this chapter, it is linked. For example, it is important for everyone to understand that the use of student design work does not automatically connote work on teaching or education. It is design work… but if design work is not fully valued, and fully recognized as important work that contributes to the discipline, profession, and beyond – like other acceptable research and scholarly work – we all miss an important opportunity that represents an important aspect in all of our lives. In *Design Research*, Peter

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Downton opens his book with: "Design is a way of inquiring, a way of producing knowing and knowledge; this means it is a way of researching" (Downton, 2003, p. 1). As we consider time, and as we reflect on the importance of voice, hopefully we could provide the time for additional conversations and actions of everyone's contributions to the advancement of our disciplines and the betterment of our world.

"Memory's images, once they are fixed in words, are erased", Polo said. "Perhaps I am afraid of losing Venice all at once, if I speak of it. Or perhaps, speaking of other cities, I have already lost it, little by little" (Calvino, 1972, p. 87).

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Epilogue

by Tu Shan
Academy of Arts and Design, Tsinghua University

In the summer of 2019, I had a study tour to Milan and Florence with dozens of students at Tsinghua University. When we arrived at Bovisa, Politecnico di Milano, Prof Barbara gave a lecture on "Time-based Design", which was very enlightened to all the Tsinghua group. After coming back from Italy, a group of s build up a more comprehensive presentation of the due layer dome of Santa Maria del Fiore Church. Finally, I found the students previewed the tour by playing "Assassin's Creed" (a game of Ubisoft Entertainment) and used the virtual experience overlapped on their site visit to support the presentation. That summer was a really nice experience for every visitor.

Besides an electronic game, I think people more often tend to explore the destination through google maps before the tour to the site. They use various App to book hotel room, tickets, and restaurant, or find a path to some destination. "Media have become indispensable tools for creating a sense of closeness at a distance, aided by simultaneous, non-deferred interaction. Asynchronous media have a lower degree of engagement than sharing media, of the experience embedded in the space of places" (Castells, 1989). Navigation App now offers a time saving route based on calculation, with integration of all kinds of geographic, environmental, spatial information and all sorts of transport media and service, tries to offer convenience but also

effect user's self-thinking, behavior, and connection with space in a comprehensive way. For an instance, navigation App uses voice instructions to replace the user's visual interaction between eyesight to the landmarks during the trip. Focusing on the voice instruction, users intend to have less connection with the environment along the planned route. "Through this connected presence, all the places we pass through are imbued with a sense of intimacy, but also a sense of separation from context and absence" (Perry, 2001).

Smartphone becomes a sort of organ extension of human body, and "places and moments of disconnection are increasingly rare: everything you can do online is open 24/7" (Barbara, 2012). People go shopping while working at office, they social in either cafe or toilet all by phone. (An US survey in 2013 showed that 75% informants used their phone while they were in toilet). Space and function are not fixed any more. Although modern static space design tries its best to carry the characteristics of mobility, communication and sharing, but as digital technique traversed the space in 'no time', made the space has far more less constrains and effects to human's actions, and subsequently loses its "strategic value". According to George Simmel's saying, "valuable is determined by the difficulty of acquisition", Zygmunt Bauman declared the "Near-instantaneity" of software time predicts the devalue of space. "As time multiplies, transforms, and empowers, on the contrary, there is a sense of the inadequacy of the real estate market and the real spaces in which we live. They are static spaces, unsuitable for the new forms of living that the revolution of technologies now allows" (Carpo, 2017).

The Pandemic and the blocked promoted comprehensive spatial intrusion of network technique into individuals and private space, and the residence has become an extension of urban space. My friend Zhang Qi shot a short film, reflecting the living condition of a small family of three in a blocked city in China. Their small apartment was forced to transform into public functions such as classrooms, offices, conference rooms, as the agenda of students(son) and employee(husband). Thus, housewife lost her boundary at home and finally affected her living condition. Space "invades" private territory,

causing the confusion of mixed-use and unclear boundaries between public and private original space fields. Under the pandemic, space is forced to make a flexible reflection of time. The film ends with the hero and heroine having sex in a car in an empty street during the mid-day, naming the dislocation of time and space, public and private.

When the physical space is blocked and dissolved during the Pandemic, the art works showed in the virtual world blurred the boundaries of reality, and even expanded the real space. Chinese art group RaidenINST recently organized an art exhibition called *Coordinates Shift*, which is based on Cryptovoxels technology in a gallery on Meta-verse. My short visit experience of this exhibition on Meta-verse was that the virtual identity, prelude before the exhibition and space jump, and immersion exhibiting environment changed the five elements of time in the book the *History Identity, Movement, Duration, Rhythms and Nodes*. We more often consider the risk of losing the meaning of static physical space and the invasion of virtual space into physical space, but in fact the virtual world is growing and closing independently, and it is also required further exploration and research.

Besides the development of data and media technique and the pandemic, capital flow dynamic changes the relationship between time, space, and people. If information era is more breaking through the division of personal and social space, globalization with capitalism is more focused on the macroscopic spatial and temporal changes of countries and regions.

As one of the first areas to start the trial of Economic Reform of China in 1984, Shenzhen must be a point with intense gravity. The inburst capital finally changes the small seaside village into a metropolis with 17.6 million population which eventually brought China into the world's economic system. Benjamin Franklin's famous saying "Time is money" was adopted by Shenzhen as a slogan.

Supported and affirmed by Deng Xiaoping, this slogan had even become one of the most crucial slogans and directions for China's reform in the last century. Shenzhen had the most density of Fordism

factories in both the country and the world at that time, which made Shenzhen the fame of world factory. Fordism enterprises, as described by Daniel Bell, were powerful hotbed/fortress/prison factory which established a strict separation of *inside* and *outside*. Big and comprehensive scale implies efficiency, advanced and sophisticated. "With the rise of capitalist society and wage labour, the home began to take on the exclusive role of dwelling, where therefore living is constituted as a 'separate' and valued function (Tosi, 1994).

This is where the functional separation between the domestic living sphere (inside the home) and the productive sphere (outside the home) began. It was also during this period that the functional subdivision of rooms became established" (Banali, 2015). Living and production, work and leisure, function and form, is dialectical division from that time.

The ungraded version fordism factories are owned by the big brands based in US and Europe and the production also designed for the market of these areas. While these brands might have even larger scale but are distracted by small volume and numerous departments around the globe. The *inside* and *outside* are no longer that clear. Global transportation network and Internet linked the factories with the brands and the markets, and also reduced space resistance and compressed the space. In the process, Shenzhen's successful use of time as a tool, connecting China and the world more closely, set up a significant "time-based design" module, while the value of time continues to rise the value of space based on distance continues to decrease.

The XIX Century was the era of "an empire could be only defined by another empire". Space self-production realized by capital beyond the limits of space and the wealth and power were rooted in the expansion of space brought about by maritime embargo. The transformation of space and time lay on the allocation and connection of raw materials, manufacturers, and markets. In the globalization era, as capital accumulation, space, and time are shaped by money which flowed around followed the gravity of profit, exactly like matter fell in twisted space which created by gravity. When power acquired the ability to acquire and process information quickly enough, it will turn

more likely to support the cyber space. With the rotation of value from land to capital, and then to information, the meaning and value of its real place will be constantly dissipated, and new scales will inevitably emerge. more and more nomads will put their lives in virtual space and leave their body in static physical space, the meaning of reality and virtual will be exchanged.

Virtual space will not be virtual forever. Instead, it may be more realistic.

Essays in the book make a great effort to discuss the changes of space and time in multiple perspectives of globalization, poetics, space travel, architecture, interior and furniture and other dimensions which are both inspired and foresighted. This remind me what Geoffrey Scott stated in *the Architecture of Humanism-A Study in the History of Taste*, "Not only do we inherit the wreckage of past controversies, but those controversies themselves are clouded with the dust of more heroic combats, and loud with the battle-cries of poetry and morals, philosophy, politics, and science. For it is unluckily the fact that thought about the arts has been for the most part no more than an incident in, or a consequence of, the changes which men's minds have undergone regarding these more stimulating and insistent interests".

The book, *Time-Based Design Paradigms*, brings important and especial meanings at the time of pandemic, and the discussion came right at the time.

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Authors

Anna Barbara (editor). Associate Professor in Interior and Spatial Design at Politecnico di Milano. She has been visiting professor at Tsinghua University, Beijing (China); Kookmin University, Seoul (South Korea); Hosei University, Tokyo (Japan) and many others. She designed professional projects in China, Japan, USA, Europe, UK and UAE, as founder of Senselab, most of them awarded and selected by international juries. Some of her researches and products have been selected by ADI-Index 2019, Italian Design Ambassador 2020, 2021; awarded Eccellenze della Lombardia. She exhibited her works at Biennale di Venezia 2010, 2011, 2021; Triennale di Milano 2018. The relationships between senses, time, spaces and design are developed in education, conferences, publications and professional works. She is the author of *Storie di Architettura attraverso i sensi (Stories of architecture through the senses*, Bruno Mondadori, 2000), *Invisible Architectures. Experiencing places throught the senses of smell* (Skira, 2006), *Sensi, tempo e architettura* (Senses, time and architecture, Postmedia Books, 2012), *Sensefulness, new paradigms for Spatial Design* (Postmedia Books, 2019), and the book *Extended Store. How digitalization effects the retail space design*, written in collaboration with the author Yuemei Ma (FrancoAngeli, 2021), as well as many other international publications.

Silvia Maria Gramegna (editor). Designer and PhD, member of Lab.I.R.Int. – Lab. of Innovation and Research on Interiors – she 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 and 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. She is Visiting Professor in KTU Kaunas University of Technology in Lithuania, and has been the recipient of ADI Design Index and Menzione d'Onore in Premio Compasso d'Oro in 2020.

Mauro Afro Borella. Architect and designer. Among his projects the first exhibition at the ADI Milan Design Museum. He is an adjunct professor at the Design School of the Politecnico di Milano and Brera where he was Coordinator of Specialist Degree in Product Design.

Teacher in the field of design for Master Courses in several university around Europe, he has developed the relationship between Industry, Design and Art by his articles and essays and by the organization of exhibitions, conferences, talks, seminars and workshops on this topic. He is a member of international scientific committees and awards juries and probo viro in ADI (Italian Design Association). Winner of the Excellence award of the Lombardy Region - ADI for Design 2019 and of the CECart award for design and architecture 2019.

Barbara Camocini. Architect, PhD in Interiors and Exhibition and Interior Design, Associate Professor at the Department of Design of Politecnico di Milano where she is also member of Lab.I.R.Int., Lab. of Innovation and Research on Interiors. Her research topics concern the contemporary human environment, changing through Adaptive Reuse processes, and the resulting strategies upon urban and residential interiors renewal, reconciling the distance between original use of spaces and emerging needs. She cooperated in design and research projects at an international level, with a specific perspective on meta-design approach. She is also interested in the History of Design with reference to the Italian culture.

Annalisa Dominoni. Architect, designer, PhD. She leads research and teaching activities at Politecnico di Milano in the field of Design.

Through her design research and scientific publications, she has been responsible for affirming the role of design for outer space.

Principal Investigator of the experiments VEST and GOAL led with astronauts onboard the International Space Station. In 2016 she creates and directs Space4InspirAction, the 1st and unique Space Design MSc course in the world recognized and supported by the European Space Agency. She is Visiting Professor in many prestigious universities and has been the recipient of several prestigious awards, including ADI Design Index and Premio Compasso d'Oro.

Raffaella Mangiarotti. Architect, and Designer. She had taught Industrial Design and Fashion Design in the Design School of the Politecnico di Milano, where she worked as a Researcher, dealing with research and studies on product design. She has also taught at Bocconi University. Her interest is focused on research and innovation through project practice. She dedicates herself to project laboratories and workshops, in collaboration with companies. She has designed products for international companies and is the author of utility and invention patents. Many of her works are published in magazines and books, part of permanent design collections and awarded internationally.

Claudia Mastrantoni. MSc in Interior Design at Politecnico di Milano, then Research Fellow at the Design Department of Politecnico di Milano, and teaching assistant in Metadesign Studio, Contest Design Studio and PSSD. Her research, starting from the early years, focused on innovative spaces dedicated to university residences of Polimi, with the definition of guidelines for communication systems and with a focus on the study of an integrated university campus model; she took part in several scientific collaborations about the design of Spaces and Services mainly related to tourism, technology, culture, business and commerce. Now PhD Candidate in Design, her Doctoral research contributes to the discussion about Public Interiors, Environments and Activities within Public Administration.

James Postell. Architect, and Associate Professor, Product Design, School of Design, Politecnico di Milan. Professor Emeritus, College of DAAP at the University of Cincinnati. Postell has taught architecture, interior design, and product design at, Texas Tech University, 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.

Peter Di Sabatino. Associate professor at Politecnico di Milano teaching in the master's degree programs in 'Product-Service-System Design' and 'Spatial and Interior Design' since 2016. His research focuses on creative, responsible, and resilient interventions in the built environment, combined with social, cultural, economic and ecological sustainability. He is a licensed architect in California.

He has taught, spoken and written extensively in various international venues, including the following selected positions: Dean of the College of Architecture, Art and Design, and Full Professor, at the American University of Sharjah in the United Arab Emirates; Chair of the Department of Environmental Design, and Full Professor, at Art Center College of Design in Pasadena, California; Full Professor of Architecture and Urbanism at Woodbury University in Los Angeles; Director of the Community Design and Urban Research Center in Hollywood; Architect and Director of Design in private practice (architecture, urbanism, landscape, and design) including significant international projects.

Francesco Antonio Scullica. Architect, PhD in Interior Architecture, Full Professor in industrial design in the Design Department at Politecnico di Milano. He carries out research, didactic activities, and consulting in the field of interior design, focusing especially on hospitality, accessibility, design for hybrid spaces and is the author of relevant publications. Many times, he has participated in national and international conferences and meetings on design.

Tu Shan. Associate Professor in Academy of Arts & Design, he is a Director at Tsinghua University in the Institute of Yacht & Nautical Environmental Design. Based on the interests on the effect of technology on different cultural environment, he completed design works and also research projects on related topics, and attended conference and exhibitions. He gave speeches and publications, as well as related studio and workshop in Tsinghua University and coordinated with other international university. At the same time, as he keeps working as an architect and designer, maintains extensive design practice and has completed works from architecture, interior design to yacht design and installations, which had won him many national awards.

Indu Varanasi. Award winning architect and designer. Born and brought up in India, Indu discovered her ability to melt aesthetic design with function. She has a degree in Architecture from JNTU in Hyderabad and a Master's Degree in Design and Architecture from SPA, New Delhi in 1993. Starting her career in Architectural practices in India and Dubai, she discovered her love for detail design and the finer aspects of design and gravitated towards Interior Architecture. In 2004, she set up her own design practice and has since been considered among one of Middle-east's top 50 designers.

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 Politecnico 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 and organizing cultural events. She collaborates with architectural studios in the field of interior design, both commercial and residential.

Susan Yelavich. Professor Emerita, Design Studies, Parsons School of Design, The New School. A Fellow of the American Academy of Rome and the Bogliasco Foundation, she is also a member of Scientific Committee for Design at the Politecnico di Milano. Her books include: Thinking Design through Literature, Design as Future-Making, and Contemporary World Interiors.

The book *Time-Based Design Paradigms*, from the LEM_ Design International series, explores the relationship between time and the design of spaces. The ongoing digital revolution and the recent pandemic have shown that the temporal dimension of spaces is a horizon that has yet to be strongly explored. In the future it is increasingly likely that it will be the forms of time, rather than those of space, that will undergo the most interesting innovations and transformations. Within the LEM (Landscapes, Environments and Mobility) section of the Design Department of the Politecnico di Milano, a group of professors and researchers, together with some international colleagues, have tried to investigate which forms of time will increasingly impact spaces: those of memory, of the everyday, of the extraordinary, of the future, of terrestrial and astronomical spaces, etc. The essays explore time: as measurements, adaptations/compositions, memories, machines and technologies, identities, narratives, sensitivities in an increasingly globalized and wrapped world.