Envisioning Transitions

Bodies, buildings, and boundaries

Alma Mater Studiorum
University of Bologna
Department of Architecture

Architecture and Design
Cultures PhD programme

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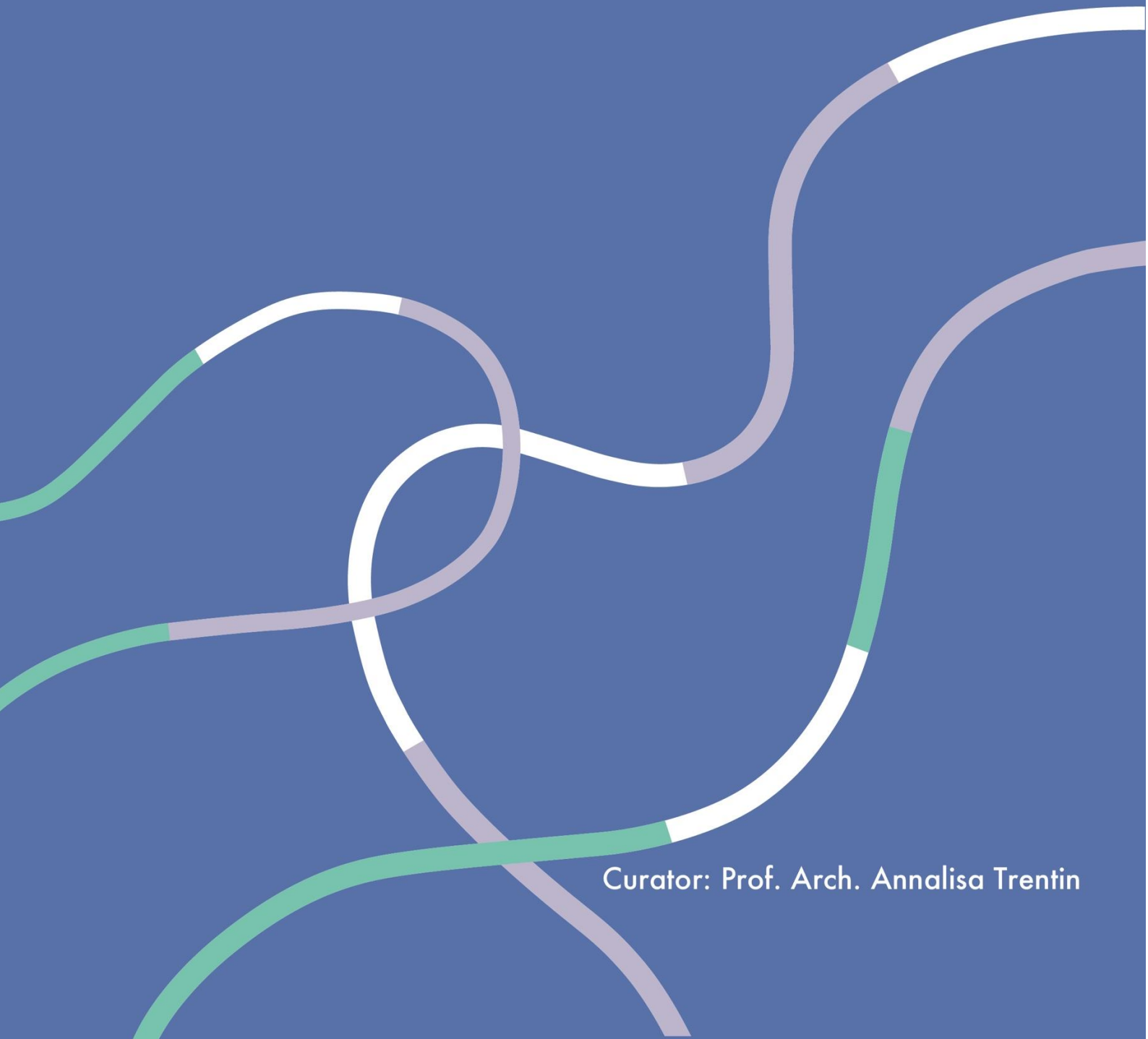

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"**Transition**" is the dynamic process of changing state, going beyond, crossing over, and passing from one point to the next. The signification of the word is close to that of **evolution, modification, mutation, and transformation**, all of which are confined into a strictly restricted timeframe.

Etymologically, "transitions" can be nothing else than temporary: they appear silently, burst, violently establish, and gradually disappear into reality. In their blinding momentariness, "transitions" bear with them the positive undertone of change and renewal, along with the hopefulness of that which is unknown.

If the term "transition" recurs regularly in the contemporary vocabulary of **architecture and design cultures**, this repetition reveals a period characterized by **overlapping and sequential changes**. The word is without a doubt overused, but not without reason. Indeed, we find ourselves in an unusually extended period of consecutive "transitions", overwhelmingly undefined in temporality and ambitions. As we are witnessing societies go through stark demographic, political, economic, and cultural changes, the intersecting problematics (e.g., ecological, digital, pandemic, etc.) form a rather complex topography of change, negatively charged by the instability of dilated time and the uncertainty of undefined destination.

The word is employed with the confidence of a natural process, as if it were a storm, and while we affirm our existence in "transition", we nod our troubled times away. Whether positively or negatively perceived, "transitions" form bridges between histories. **Yet, what does it actually mean to be in "transition"?** Can we define it as an autonomous and productive period whose importance could go beyond a starting and an ending date? How are "transitions" impacting and being impacted by human spaces, the built environment, and design cultures? What are some concrete, practical case studies that demonstrate how "transitions" could affect architecture and design cultures while emphasizing the role that these disciplines play in transitional processes?

It is within this backdrop that we put forward the theme of "transition"—in all its simplicity and complexity.

SCIENTIFIC COMMITTEE

The Scientific Committee is composed of the members of the Academic Board of the PhD Programme in Architecture and Design Cultures, Department of Architecture, Alma Mater Studiorum - University of Bologna.
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XXXVI PhD Cycle in Architecture and Design Cultures: Andrea Cattabriga, Valentina De Matteo, Francesco Di Maio, Lorna Dragonetti, Arshia Eghbali, Clara Giardina, Marco Iannantuono, Jing Zou, Giulia Marzani, Angelo Massafra, Claudia Nigrelli, Serena Pagliula, Marco Palma, Dafni Retzepi, Yuqing Zhu.

INTRODUCTION

Prof. Annalisa Trentin, University of Bologna

This publication collects the contributions selected and presented at the international conference, *Envisioning Transitions. Bodies, buildings and boundaries*, organized within the 36th cycle of the PhD course in Architecture and Design Cultures of the Alma Mater Studiorum of the University of Bologna, held in December 2022.

The international conference, organized by the doctoral students, has become an annual appointment, developed for the discussion on topics of interdisciplinary nature, useful for expanding knowledge and research goals, carried out within doctoral research and within the Unibo Department of Architecture.

The PhD program in Architecture and Design Cultures is multidisciplinary in nature, bringing together the specificities of architectural composition, urbanism, history, aesthetics, design, cultural heritage, technology, and design, combining fundamentals and applied research in an interdisciplinary perspective. The research activity is therefore developed according to thematic areas that, given the nature of the PhD program, aim to develop studies in the field of architecture and design cultures as wide as possible.

The international conference *Envisioning Transitions. Bodies, buildings and boundaries*, which follows those organized in previous years as: *The Matter of Future Heritage*; *CHANCES Practices, spaces and buildings in cities' transformation*; *The Ecological Turn. Design, architecture, and aesthetics beyond "Anthropocene"* and *Ground(s) - Mapping, designing and caring: Towards a convivial society*, once again focuses on topical matters trying to open a debate on contemporary issues.

The topic of transition and its relevance in the field of architecture and design, identified by PhD students of 36th cycle: Andrea Cattabriga, Valentina De Matteo, Francesco Di Maio, Lorna Dragonetti, Arshia Eghbali, Clara Giardina, Marco Iannantuono, Jing Zou, Giulia Marzani, Angelo Massafra, Claudia Nigrelli, Serena Pagliula, Marco Palma, Dafni Retzepi and Yuqing Zhu, was identified in three tracks with the intention of answering specific questions: the first track 'Bodies' questions on how to relate bodies and transitions; the second track 'Buildings' focuses on how architecture is adapting to the demanding framework of transition, and finally the third track 'Boundaries' focuses on how territories, cities, and various spaces of interactions are transforming and therefore the boundaries between people and objects, spaces, and different relational dimensions.

The selection of papers collected in this publication with the relevant contribution of keynote speakers Paul Emmons, Jean-Baptiste Fressoz, Laura Kolbe and Ami Skånberg Dahlstedt, testify an effort to combine contributions from different disciplines and provide different visions and interpretations on Transitions.

Annalisa Trentin
Coordinator – Unibo PhD program in Architecture and Design Cultures

KEYNOTE SPEAKERS

Opening Lecture

Jean-Baptiste Fressoz - French National Centre for Scientific Research | CNRSS

JB Fressoz is a historian of science, technology and the environment. He was a lecturer at Imperial College London before joining the CNRS in Paris. He is the author of several books, including L'Apocalypse joyeuse. une histoire du risque technologique (2012), L'événement anthropocène, la terre, l'histoire et nous (2013, 2016) and Les Révoltes du ciel. Une histoire du changement climatique, XVe-XXe siècles (2020). The latter two books have been translated into Italian. He will next publish a book entitled: Sans transition: une nouvelle histoire de l'énergie.

Track 1 – Bodies

Ami Skånberg Dahlstedt - Stockholm University of the Arts

Suriashi as a method for mortal mo(nu)ments

Ami Skånberg Dahlstedt, PhD in Dance from University of Roehampton, UK, is a performer, choreographer, filmmaker and teacher. She is the current Head of the Master's programme in Dance Education at the Stockholm University of the Arts, and also works at Academy of Music and Drama at University of Gothenburg. Ami has co-chaired the Nordic Summer University Study Circle of Artistic Research with Dr Lucy Lyons. She is a member of the Peer Review board of Journal of Artistic Research. Ami often creates stage work (solo, and collaborative) based on her embodied life story in a particular theme. Her 90 min solo performance A particular act of survival received a performing arts award at Scenkonstgalan in Sweden in 2015. Her new screendance piece Ancestor premiered at Dansfilmfestivalen in Feb 2022. Ami makes dance films and documentaries about dance. Her debut film won an honorary mention at VidéoDanseGrandPrix in Paris 1995. She walks slowly as a ceremonial, subversive act thanks to her studies with Nishikawa Senrei and work with Japanese dance in Kyoto since 2000. Her research interests are practice-led and concern gender codified movement practice, non-hierarchical processing of global dance techniques, and auto-ethnographic accounts from within the practice. Her PhD thesis has the title Suriashi as Experimental Pilgrimage in Urban and Other Spaces.

Track 2 – Boundaries

Laura Kolbe - University of Helsinki

From Socialist Capital Cities to Neoliberal Metropolises: Transformation of Urban Symbols, Identities and Histories in Central and Eastern Europe after 1989

Laura Kolbe, Ph.D. (Helsinki) professor of European history at the Department of History, University of Helsinki. She is author of Helsinki, the Daughter of the Baltic Sea, editor of Finnish Cultural History I-V and co-editor of the series History of Metropolitan Development in Helsinki - post 1945. Dr. Kolbe's research is in Finnish and European history, urban and university history, national and class history. Her latest research deals with urban governance, city halls and municipal policy making

in Helsinki and Scandinavian capital cities during the 21st century. Kolbe is founder and chair of the Finnish Society for Urban Studies (2000). She was the International Planning History Society's (IPHS) Conference Convenor in 2000 and President of IPHS in 2007-2012. She is currently the chair for History Committee of the City of Helsinki.

Track 3 – Buildings

Paul Emmons - Washington-Alexandria Architecture Center of Virginia Tech

Betwixt and Between: Architecture's Mercurial Liminality

Paul Emmons is a registered architect and the Patrick and Nancy Lathrop Professor in Architecture at Virginia Tech where he is Associate Dean of Graduate Studies for the College of Architecture and Urban Studies. Emmons is based at the Washington-Alexandria Architecture Center and chair of its PhD in Architecture and Design Research program. He earned a PhD in Architecture from the University of Pennsylvania and a Master of Architecture from the University of Minnesota. His research on design practices focusing on architectural drawing has been presented at venues around the world. His published work includes the book Drawing Imagining Building: Embodiment in Architectural Design Practices (2020) and coedited volumes: Ceilings and Dreams: The Architecture of Levity (2019), Confabulations: Storytelling in Architecture (2018) and The Cultural Role of Architecture (2012

Track 1 | BODIES

Reflections can be made about the sense of precarity and uncertainty that transitions embed, leading to initially temporary phenomena that invest the different spheres of the social dimension but then seem to become permanently adopted in the society.

How are people's habits and lifestyles changing, both individually and collectively? How do design cultures take this into account? Thinking about the somatic dimension of humans' experience, how are technologies perceived and accepted in the digital transition? (e.g., the performative construction of the identity, the artistic display of somatic experiences in the context of new technologies).

How to relate bodies and transitions? Perhaps we should first ask what the body is perceiving? And what is the position we occupy in relation to what is happening? Inner, outer, near, far, centre, periphery.

What is the temporal and spatial dimension of this particular transition? How is it affecting our perception and representation of time and space, of our "self", of our relationships with the Other?

If by transition we mean the perception that something is changing, that we are changing, that we need a different attitude towards the way we are living, the duty to produce different forms and different relations that question the assumptions that have led us so far (e.g., economic, technic, scientific), what would aesthetics of transition be about?

Reclaim (the Land used to be called by the colonizers as) Minas Gerais: Cosmopolitical Eccentricites and the new People

Frederico Canuto – Federal University of Minas Gerais / Brasil

ABSTRACT

This article is based in two research projects (Pedagogias Políticas: Arte, Cidade, Urbanismo e Democracias financed by FAPEMIG and MORAR INDÍGENA: conflitos e aproximações entre a concepção idealizada e a vivência cotidiana na produção do espaço indígena em Minas Gerais, financed by CNPQ) and it intends to present the different meanings that the term Reclaim has taken from the struggle on indigenous life in the state of Minas Gerais, Brazil. Based on three narratives produced within the scope of the Morar Indígena extension program, within the Architecture School of Federal University of Minas Gerais, it is our intention to address the specificities of each territorialized mode of life and show how they are examples of a necessary turn towards other worlds. And finally, the article discusses such reclaims and their potential in times of the Coronavirus pandemic, in 2020 and 2021.

The first narrative is a comparison between the Maxakali and Xakriabás, two indigenous people that live in north of Minas Gerais. The first ones struggles against the lack of water distribution system and the non-adaptation by them of the use of recent technologies regarding sewer and bathroom. The second one are suffering with the transition from the subsistence farming to the consume of processed food because many of the young xakriaba ae more interested in supermarket than planting. Such transitions are changing radically their relation with the land, provoking a new kind of take of their territory.

The second narrative is related to a squatting indigenous occupation by the Pataxó Hã Hã Hãe of a territory in the Metropolitan Region of Belo Horizonte, the capital of Minas Gerais. Since the environmental disaster occurred in Paraopeba river in 2019 when the Dam with mineral rejects broked and invaded the city of Brumadinho, all the relation between them and the land was transformed.

The third narrative is related to the indigenous struggle within Belo Horizonte city related to their visibility and existence from the City Hall. From the struggle to their traditional use in public transportation to the proposal of a Multi-ethnical building to welcome indigenous people from all over the country, such demandings inaugurate a new form of Reclaim.

KEYWORDS

Decolonial Thinking; Cosmopolitics; Cartography; Indigenous Living

1. Introduction

As the journalist Eliane Brum assertively affirms, Brazil is the periphery of the Amazon. She affirms that because the amazon forest is the central point of dispute regarding ecology equilibrium in a word scale. Agreeing with her, we can say that the indigenous people that lives there and protect the forest have the same importance too. But despite that importance, Amazon and indigenous people are suffering pressions from the industry of iron mining, agro-industrial business and wood exploration. On the other hand, despite the violence against them (the invasion of their lands and assassination of their own), we can see that indigenous groups are growing in Brazil, occupying and protecting land through reclaiming practices. They are growing without a legally land to be part of, but they are surviving and living. So, reclaim and occupy lands are the main objective of indigenous organizations. So it is possible to apprehend that such new lands are, in a broader sense, amazon forests.

Having this context in mind, such growth of indigenous groups happens with problems related to land limitations, struggle with government and companies, violence from the state and groups that have economical and political interest in the land. And at the same time, some of these new groups are having to relearn what is to be indigenous because such identity is defined by the use of the land, that is something that is being compromised.

In that sense, occupy a piece of land is only the beginning of the process. It is necessary to reclaim the land, or to reconstruct a bond with the place. SZTUTMAN (2018) paraphrasing Isabelle Stengers writes about the cosmopolitical repercussions of such reclaiming, relating them to enchantment and witchcraft. To reclaim is to take part of a world and not only put your foot in a place. And those difficulties are the themes of the discussion in this article.

2. Methodology

This article intends to present the different meanings and territorial occupations that the term and practice of *Reclaim* has taken from the perspective of struggle of indigenous people in the state of Minas Gerais, Brazil. Based on three narratives produced within the scope of the Morar Indígena (Indigenous Living) extension program, within the Architecture School of Federal University of Minas Gerais[1], it is the article intention to address the specificities of each territorialized way of life and show how they are examples of a necessary turn towards other worlds. And finally, the article discusses such *reclaims* and its potential in times of the Coronavirus pandemic, in 2020 and 2021.

The first two narratives (part 03.01 ad 03.02) is a comparison between the Maxakali and Xakriabás, two indigenous people that live in north of Minas Gerais. The first ones struggles against the lack of water distribution system and the non-adaptation by them of the use of recent technologies regarding sewer and bathroom. The second ones are suffering with the transition from the subsistence farming to the consume of processed food because many of the young xakriaba ae more interested in supermarket than planting. Such transitions are changing radically their relation with the land, provoking a new kind of take of their territory (part 03.03).

The second narrative is related to a squatting indigenous occupation by the Pataxó Hã Hã Hãe of a territory in the Metropolitan Region of Belo Horizonte, the capital of Minas Gerais (part 04.01). Since the environmental disaster occurred in Paraopeba river in 2019 when the Dam with mineral rejects invaded the city of Brumadinho, all the relation between them and the land was transformed (part 04.02).

The third narrative is related to the indigenous struggle within Belo Horizonte city related to their visibility and existence from the City Hall (part 05.01). From the struggle to their traditional use in public transportation to the proposal of a Multi-ethnical building to welcome indigenous people from all over the country, such demandings inaugurate a new form of Reclaim (part 05.02).

And finally, during the COVID pandemic, such experiences of reclaim generated other territories and we will address that as an unfolding of a transition time (part 06).

3. In Reservations

[1] The Morar Indígena Extension Program located in the School of Architecture of the Federal University of Minas Gerais aims to promote extension projects, linked to research and teaching, in partnership with non-governmental groups and indigenous organizations to generate and apply social technology and technical assistance methodologies in architecture and urbanism for territorial management, construction of collective spaces and housing for the indigenous population of MG, within the principles of social and environmental sustainability, aiming to contribute to the improvement of the quality of life of these groups and to the cultural differentiation of the indigenous future.

3.1 XAKRIABA

The incursions of research members of MORAR INDIGENA Extension Program into the Xakriabá territory have been taking place since 2014, but three moments stand out and serve as starting points for a closer look at land reclaims. First of all, in 2014, when we went there for the first time on order to get to know the microlocalities within the reserve and the sustainable housing project that would be implemented by the Minas Gerais Urbanization Company (COHAB) of the Minas Gerais state government. Then, in 2016, as part of a field study of the Architecture and Urbanism course at the Federal University of Minas Gerais (UFMG) within the reserve. And in 2019, as part of a partnership between FIEI (Intercultural Formation of Indigenous Educators) and the extension program Morar Indigena, both from UFMG, together with leaders of the reserve, with the objective of project and construct a birthing center within the indigenous territory. In these three moments, the dryness of the landscape always drew attention and showed how dwelling in that land was not an easy task. Even more, the school, a partner for our presence in the territory, became the epicenter of a dispute over the meanings of the living as an indigenous in that territory.

In this case, food security is an example of the numerous crossroads of the Xakriabá people who have the school as a place of conflict, ranging from the content given by the teachers, to the teaching structure and relationship with federal guidelines regarding production of food. The lack of arable land and inputs for production on a larger scale imposes on the people the difficult choice between the task of planting land that is difficult to care for; receive canned food from institutionalities; or go to town and buy your food at supermarkets. Reclaming the land is a daily political decision, as it involves assert daily as an indigenous person of that place, living from it.

3.2 MAXAKALI

There are also problems between the indigenous people and the sanitation facilities in terms of manners of using them. The toilet is not something common to the Maxakali culture, which means that they are not used to it and such non-use perpetuates problems in the village regarding sanitation and waste management. Such equipment ends up being used as places for other uses such as garbage can, chicken farm, etc. The sanitary facilities in the village placed are generic and used in any context, which means that the specificity of the Maxakali issue was not taken into account in dealing with the issue of sanitary sewage.

3.3 RECLAIM AN ECOSYSTEM

Reclaim the land for them does not mean fighting for a piece of land they can call their own, but taking part in a larger ecosystem in which their presence is not invisible, but also not synonymous with modernizing progress, as it is for white people. Building a grounding through reclaiming is to build a relationship with a territory different from that of sanitizing Modernity. The soil produces food, is a place of transit, is a place for prayers and songs, as well as a space for swimming and drinking.

4. In occupation

4.1 PATAXO HÁ HÁ HAE

The Naõ Xohã village is the most recent territory named as belonging to indigenous peoples (plural) in Minas Gerais. It is located in the metropolitan region of Belo Horizonte (RMBH). Following its occupation and foundation since 2017, the MORAR INDIGENA Extension Program saw the birth and establishment of a multiethnic community there. With regular field trips, we saw not only a territorial reclaim that is a dispute over what it means to be indigenous today.

Around 2017, members of the ethnic group Pataxó Hã Hã Hãe became aware of a territory of preserved forest on the banks of the Paraopeba River in the municipality of São Joaquim de Bicas, in the Metropolitan Region of Belo Horizonte (RMBH), about 50 km from the center of the capital, adjacent to a recent occupation of the MST group called Pátria Livre. In view of these difficulties of staying in the city related to costs and violence, in October 2017 some families started a camp that marked the beginning of the reclaiming of the land and the creation of the Naô Xohã village, marking their position. Once the village was founded, the Pátria Livre camp supported the indigenous people with material, infrastructure and travel to the city, including agreeing with them the limits of each of the occupations.

Since the beginning of the reclaim, the Pataxós Há-Há-Há and other indigenous residents of the RMBH, belonging to different ethnic groups and who made up an incipient group that sought to support indigenous causes in the city, joined forces. In addition to these, there were also some families who were related to the Pataxós Hã-Hã-Hãe families and who call themselves Pataxó ethnic group, originating from the Barra Velha village, also located in the southern region of Bahia.

In early 2019, the Naô Xohã village was surprised by the collapse of the Vale mining dam near Brumadinho, in the metropolitan region of Belo Horizonte, very close to their location, specially their river, the Paraopeba. This event considerably transformed the village's relationship with external agents and also the relationship of the internal groups involved. Since then, the village came out of invisibility, began to suffer media harassment and receives constant visits and donations from philanthropic entities and the mining company itself because the river cannot be used to leisure, rituals or food anymore. The event contributed, at first, to accentuate internal conflicts and resulted in greater disunity in the group, with supporters and indigenous families of other ethnic groups deciding to leave the village, with the majority of the indigenous peoples of the Pataxó Hã-Hã-Hãe ethnicity standing there. In a second moment, new leaderships emerged and the internal organization became less concentrated in the hands of a few. Since then, a complex negotiation has been going on involving the Federal Public Ministry (MPF), the mining company Vale and the indigenous people (accompanied by members of FUNAI). The MPF pressures the mining company to carry out improvements in the area, guarantee compensation and rewards for the indigenous people, and they request the demarcation and implementation of their permanence in the territory.

4.2 RECLAIM A MEMORY

The meaning of reclaim is related to a desire to remember the relationship with the land through the creation of a village. A cosmovisionary foundational movement of rearticulating native peoples with the territory. Although the question that urgently arises at this moment concerns how to reclaim a land other than the one contaminated by the mining disaster, such a foundation throws into the future, far from the muddy present, a will for creation based on a terrestrial origin. .

5. In cities

5.1 INDIGENOUS IN URBAN CONTEXT

In Belo Horizonte, the capital of Minas Gerais, Brazil, two facts make the situation of indigenous residents of urbanized contexts clear: the information that according to the 2010 CENSO, there are more than 5,000 indigenous people in the RMBH (Metropolitan Region of Belo Horizonte) and the fact that there are few sections of municipal legislation that are associated with the preservation of indigenous rights and culture in the city. This is a reflection and symptom of the physical

and symbolic violence generated due to the prejudice that has been responsible for deaths.

In everyday life itself, there is a policy that prevents the full exercise of their existence because there is no policy that recognizes their situation as a minority. As mentioned orally by the leadership Avelin Kambiwá, an example of this is the cases in which impediments to their entry into public transport and private mobility services (taxis or transport apps) are observed. So much so that in 2013 the Federal Public Ministry even recommended that the company BHTRANS, the company responsible for public transportation in Belo Horizonte, adopt measures to ensure the rights of indigenous people inside the buses. Others, according to the leadership, confirm the difficulties of care and understanding of the indigenous in health posts, as well as the refusal of ritualistcs performances in hospitals - even if authorities of other faiths can enter the points of hospitalization almost freely.

With these violences in mind, MORAR INDIGENA Extension Group along wht indigenous representatives from various ethnical groups proposed a Indigenous Reference Center to the municipality.

The objective of such a Center would be to initiate a process of production of local multipliers of the indigenous presence in Belo Horizonte, offering shelter to those indigenous people in transit through Belo Horizonte and the metropolitan region, as well as coming from other locations, whether to sell handicrafts or visit relatives. respectively; as well as a place for storing and exposing indigenous handicrafts. Furthermore, it would be a reference for the city of a presence that has been invisible since forever.

5.2 RECLAIM A POTENTIAL EXISTENCE

The indigenous presence in the city of Belo Horizonte does not refer to the real existence of one or another ethnic group. The real existence here is irrelevant. What matters is that the existence of indigenous people in the city points to a virtuality, where there is a construction of a multi-ethnic village with space for everyone. More than locating their presence in the territory - an effort that the indigenous themselves do not want to be made so that they are not located and monitored by the institutions -, this reclaiming that points to a global village of Belo Horizonte is performed by the project Centro de Referência Indígena. Retaking an imaginary in which it is possible for the most diverse to coexist in the same place that is the city, from white people to the Pataxó people, opens horizons for a conflictive policy (since there are several peoples who will inhabit there) based on a radical hospitality to the other. It is not about draw segregatated lines to a new indigenous reserve or demanding the territory of the ancestors, but knowing the impossibility of such desire, living in a new ground of sharing. Reclaim it is not only about physical and material existence, related to the soil and life from it, but also associated with images of presence often considered non-existent. Appearing as and through a reference center is the terraforming of an atmosphere of coexistence.

6. Epilogue or how to multiply during pandemic times

In 2020 and 2021, during social isolation and the coronavirus pandemic, many managed to isolate themselves, vaccinate and protect themselves and their relatives. However, this did not mean a cooling off in the struggle for land, for the reclaim of a sense of existence by the indigenous peoples and, in the case of those mentioned here, actions were taken in order to continue to exist on a planet that responds with a deadly virus.

This article, which was written throughout 2019 and ended in early 2021, did not see the new developments that the pandemic

produced with these peoples in 2022. Thus, this "Epilogue or How to multiply during Pandemic Times" comes not only to close this work, but to show how the reclaims do not cease to happen, being an endless political gesture against 500 years of expropriation, including the pandemic. New alliances have been produced, new relationships with the land are being invented, new indigenous lands have been created.

In the case of the Xakriabás, the pandemic was also a time of material loss and reconstruction of a dwelling. They lost ther learning environment, the Xukurank Indigenous State School in Aldeia do Barreiro, by criminal fire. In a partnership between the MORAR INDIGENA Extension Group and leaders of the reserve, through remote visits and discussions, they were building a work front and participatory processes for a new project, being the construction funding by the government of MG.

The Naõ Xohã village expanded and multiplied in 2021. From there, arose the Katurãma Pataxó Hã-hã-hãe indigenous village. As stated on the crowdfunding website created by them and supporters:

> About 20 indigenous families of the Pataxó and Pataxó Ha-hã-hãe people occupied the Mata do Japonês, in São Joaquim de Bicas, on Wednesday afternoon (6/9), after the donation of the land by the Mineira de Cultura Association. Japanese-Brazilian. The group lived on the banks of the Paraopeba River and was hit by the Brumadinho dam failure in 2019. Since then, they have suffered from the death of the river and the lack of support from Vale to find a suitable new territory to settle in".

Although in the process of organization and territorial occupation, they have been discovering there for just over six months how to obtain natural resources and forms of contact with nature, as well as delimiting and taking care of an area against invading land grabbers.

And finally, against the lack of institutional support and scarcity of resources for a dignified life according to their ways of life, the Maxakali have taken back their land and are building the Aldeia Escola Floresta (Village – School – Forest).

> "In the early hours of September 28, 2021, a community of almost 400 people arrived in a region known as Itamunheque, and took over a land where they plan to build the dreamed ALDEIA ESCOLA FLORESTA. It is a project of reforestation, agroecology, peace and prosperity, where they want, with the teachings and strength of their spirituality – the Yãmĩyxop – to find the balance of their lives with water, animals and the forest. Since the beginning of the pandemic, this community has left Aldeia Verde in Ladainha in search of a territory where their children could have access to a river, where they could renew their rituals, plant and build their schools. They passed through a land that was about 4 km from the Engenheiro Wenefredo Portela Plant that had structural problems causing risks of rupture. Then, deceived by swindlers, they settled on a farm near the District of Concórdia, which they called Aldeia Hám Kaĩm. Since then, village leaders have been talking about their struggles in all spaces: at the Art Biennial in SP, at festivals, at round tables, at universities. The struggle of this community is the struggle of the entire Tikmũ'ũn people who should receive great recognition from the Brazilian state and all citizens, and it is the struggle of all those who believe in the need to live on a biodiverse planet, with the freshness of forests and the richness of clean waters. It is the struggle for the autonomy of the peoples. It is the struggle of those who believe that it is possible to produce

> without cutting down forests and destroying more lives. “

The architect Paulo Tavares has worked at his Agencia Autonoma in alliance with some indigenous Amazonian peoples in the search for evidence of forms of collective Amazonian indigenous settlements. The objective is both to assist in an advocacy practice aimed at repairing these peoples separated from their lands and to serve as a basis for the scientific and historical affirmation that this land has always been inhabited and not just discovered. As Ariella Azoulay (2019) puts it, it is precisely the paintings and images produced by naturalists and painters in these discoveries that shaped an imaginary that nothing existed but savagery and a great nothing in these lands. Therefore, there is nothing more karmic than through the same images to affirm the lie of such colonizing imagery constructions.

However, these same traces showed an intricate and complex network of settlements in which a form of territorial urbanization unfolded before the European invasion of the territory now called Brazil. Not cities, but an extensive and time-shaped network, nomadic and fixed at the same time. Thus, moving forward to the present moment in a retro-affirmative and futuristic movement, when looking at these reclaims cartographed since 2017 and the new forms even during the pandemic in 2020-2021, such unfoldings Xakriabás, Maxakali, Pataxós show not a disappearance or even persistence of the presence of native peoples, but their continuity in terms of spatial production.

In the text “War in Primitive Societies” by Pierre Clastres (2005), the French anthropologist already gave indications of an understanding of this approach to an indigenous socio-spatial policy based on irreconcilable differences, unlikely and pragmatic friendly alliances and territorial fragmentation by war. So, who knows, provocatively, what can be seen in such movements today is precisely such a war – with other agents, but a Clasterian war. In this contrived war, who knows if what we will have in the future, interspersed in our cities covered in mud, bottled up with air-conditioned cars, in pandemic lockdowns will not be a network of indigenous territories, whose way of living takes place in a radically earthly relationship? Following the thinking of Debora Danowsky and Eduardo Viveiros de Castro in “There is a world to come” (2014), if the white world ends, others will continue to exist.

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The body responses and the role of neuro-design in the digital transition

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ABSTRACT

The ongoing digitalisation is increasingly affecting Architecture and Design by becoming one of the main adopted tools for projects' effectiveness, especially for ensuring fruitful communication between designers and non-professional users. However, in this specific context of an ever-growing design's virtualisation as well as of the digital transition times, how are the technologies effectively perceived by the final users? The field of the user experience is increasingly gaining ground through the analysis and study of the good usability of the technological tools by, however, simultaneously showing a crucial gap in the analysis of the body experience. In an increasingly digitalised world that is moving further and further away from the physical world, the study of body perception almost in fact seems not to be addressed. However, the perceptive and emotional interaction between Digital Design and users first passes through the corporeal responses generated by the body, which is the threshold of cognitive and emotional experiences thanks to its ability to live the experiences without mental superstructures. Hence, are the technological tools somatically accepted? Moreover, in this perspective, is it possible to analyse the Digital Design impact on users' corporeal responses? What are the tools to be used for this purpose? The body experience and the unconscious responses of the users must be the focus of innovative and interdisciplinary research able to understand the immediate and not psychic filtered response to the sensations that digital spaces and objects evoke. Based on this assumption, this paper aims to introduce the importance of the emergence of an arising field named "Neuro-Design" to highlight its potential application in the design field and, especially, in the evaluation of physical user experience in relation to Digital Design. The Neuro-Design is a research area with a huge potential to be discovered: it is in fact the result of the interdisciplinary combination between Neuroscience and Design, and it represents the possibility of the disciplines of planning to interface with the scientific areas that deal with human perception, behaviour and corporeal responses. The perspective of psychology and neuroscience can be crucial to understanding the human responses to Design and its boosted use of digital tools. This approach could in fact enriches the designers' awareness of the impact of their choices by increasing their ability to be at the service of society.

In this framework, the present paper opens new horizons by placing at the center people's physical feelings and their physiological reactions by bearing in mind the goal of more aware planning in the context of the current digital transition, highlighting possible future developments and research directions that call for the adoption of an interdisciplinary method or, perhaps, of an in(ter)disciplinary approach that moves from the knowledge of the human body overcoming disciplinary boundaries.

KEYWORDS

Neuro-Design; User Experience; Body Responses; Digital Design; Digital Transition

1. The increasing digitalisation

Nowadays, in a World deeply affected by the impact of the pandemic scenario, the ever-growing use of digital technologies has taken on a further accelerating momentum, as emerged in the Report *Digital Transformation in the Age of COVID-19: Building Resilience and Bridging Divides* (OECD, 2020). The issues derived from the need for distancing and, concurrently, the advantages of the ease of connection and the breaking down of geographical barriers, are indeed clear both in

recent planning and communication applications.

Apparently, in this perspective, one of the most useful tools that has overcome the physical distancing caused by COVID-19 has been the digitalisation, which has contributed to reducing the gap by guaranteeing communication and collaboration in various fields such as education and social spheres (Penco et al., 2022).

Specifically, within this digital boost, virtual reality and its related declinations have undergone rapid and exponential growth in recent years (Kim et al., 2013; Loureiro et al., 2018; Zhang et al., 2020) to such an extent that they are currently considered among the major developments of the coming decade and that they are expected to have an annual growth rate of 15.0% from 2022 to 2030 (Grand View Research, 2022) becoming both in the Built Environment and in the Industrial Design preponderant design and communication tools.

On the one hand, they are in fact used by professionals as a means of design elaboration, on the other hand, they are increasingly used as communication tools in the same way as a common linguistic register between experts and their clients. In the current times, in fact, virtual prototypes and immersive environments are often to be considered pivotal elements for the advanced knowledge of product satisfaction (be it Product Design, Building Design, etc.) required to avoid the discrepancy between the Concept Design and the real psycho-physical users' satisfaction as highlighted in these Pandemic times (Martel et al., 2021; Mehta, 2020; Paköz et al., 2021; Ugolini et al., 2020). Although this kind of approach is increasingly being adopted, there is a parallel need to firstly deepen the validation of digital technologies as interaction tools for the design process by investigating their technological 'acceptance' by the target audience. But how can this be done? Is it possible to “listen” to our body in order to discover our instinctive relationship with the current digital transition? (Figure 1) According to Vergote (1983), the body should be considered the place, the object and the agent of the human being. The paper aims to answer the questions raised by the call by analysing the apparently antinomian relationship between increasing digitisation and the role of the body. In this digital era, body perception may indeed play crucial role in this regard and inform designers to listen not only to the conscious and rational responses but also to the immediate and non-conscious responses in order to understand the strengths and limitations of the current digital transition. The challenge is certainly daunting and requires a clear holistic view that, through an interdisciplinary approach, can help designers in such a reading. Is there a discipline that can help with this view? In recent years we are witnessing the dawn of a new discipline, as rich in stimuli as it is in limitations due to its recent birth: Neuro-Design.

Figure 1. Digital transition and the role of Neuro-Design. Eleonora D’Ascenzi. Credits Eleonora D’Ascenzi

2. The role of the Neuro-Design

Neuro-Design is considered an interesting arising research field that emerges as a cross-disciplinary initiative (Liu et al., 2020). But what is Neuro-Design? Although it is not easy to find an exhaustive definition, may be deemed a new approach able to incorporate human factors in the Design field (Babiloni, di

Lucchio, et al., 2021). It is therefore primarily a dialogue, collaboration and bridge between Neuroscience, Psychology and Design. According to Gallace (2015), Neuro-Design "is addressed at identifying design aspects of physical or virtual objects/environments that our brains naturally find more appealing", emphasising in this respect its resemblance to the capacity of aesthetic evaluation. According to Bridger (2017), Neuro-Design is composed of several fields of research that can support the work of designers by tracking trends in user reactions without, however, replacing them with the intuition of the professionals. What is important to emphasise in fact, also due to the type of name that presages a field of investigation strongly connected to marketing, is that its innovative charge lies in being used as an interdisciplinary observation tool that, according to Elisabetta Canepa (2019) ends in translating these observations into performative but non-prescriptive guidelines. The emerging field of Neuro-Design employs in fact knowledge that can have a huge role in enhancing the effectiveness of Design, be it Architectural, Product or Digital Design. In fact, Neuro-Design proves to be a means to help investigate the well-being and perception of users in the design field by attempting to proceed through scientific investigation tools that are well-defined and capable of analysing not only the conscious responses of the recipients - usually analysed through questionnaires and interviews - but also through the study of non-conscious responses, coming both from specific analyses of the brain and from the body responses. Although this is still a field of research to be explored, given its recent nature, it is nevertheless already offering interesting insights that can be deployed in both the academic and working communities. The opportunities to be grasped are manifold from the point at which it is by its own nature a very broad and not clearly delimited field of investigation. Therefore, what seems of particular relevance in the light of pandemic events and increasing digitalisation is the hypothesis of being able to investigate the users' responses to digital technology and consequently work on the limits that derive from it by analysing a current research gap (Figure 2).

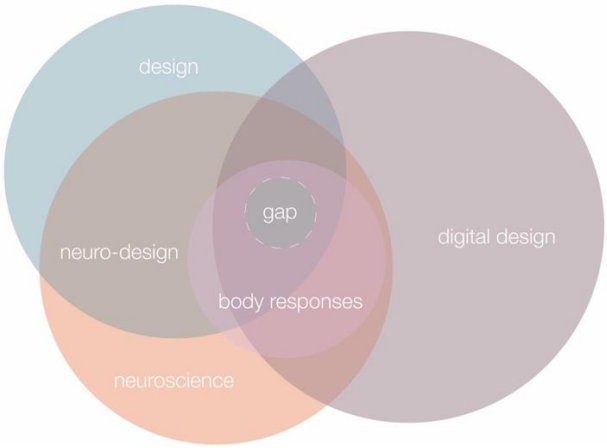

Figure 2. Digital Desing and Body responses: the gap. Eleonora D'Ascenzi. Credits Eleonora D'Ascenzi

In this perspective, different Neuro-Design approaches can be used. Among these, one of those that most intrigues the author of the paper, refers to the study of the body and the physiological responses of the recipients of use: wherever the virtual world in fact relentlessly advances, what is the experience of a Digital Design product or the immersive environment in which it is located? And, most important, how does the body, devoid of mental superstructures, respond instinctively? In the next section, we will see which approach can be adopted.

3. The body responses

According to embodied cognition, our body is always located in space, and it reacts involuntarily to outside forces, by suffering its causal consequences (Kirsh, 2013). Moreover, to our knowledge, the body partly shapes the way we act and perceive: how we sense the world is in fact largely built into our bodies -

where our senses are (Kirsh, 2022). In addition, who drives the exploration of the complexity of the multisensory experiences of Architecture and Design? The body (Macagno, 2022). According to Babiloni (2021, pag. 7) "Molto spesso le emozioni percepite durante le stimolazioni sensoriali a cui siamo sottoposti nella vita di tutti I giorni non si appalesano al nostro controllo cosciente". As such, our body has a crucial role not only in experiencing space and products, whether they are real or virtual but also in the anticipated knowledge of satisfaction. For this reason, the analysis of the body and unconscious responses of the users would be a great area of research since they help to understand the perception and emotional experience of the recipient. According to Antonio Damasio (2012), in fact, emotions are a series of intuitive and recurrent bodily responses that the human species has developed in order to survive in a complex environment. Similarly, a long time before, Darwin (1872) argued that emotions enable an organism to better adapt to the salient features of the stimuli offered by the environment. An example that can help to better understand how the change produced by such a 'discharge' of the body is to be considered an intuitive and emotional bodily response is suggested by Riva and Gaggioli (2019) who show that the activation of SNS (Sympathetic Nervous System) is related to the activation needed to prepare our body for the action of escape or attack when faced with dangerous situations. This kind of release of adrenalin, beyond the increase of the state of vigilance, increases the rate of breathing, heartbeat and so on. For this reason, the analysis of bio-parameters (such as heart rate variability, galvanic skin response, respiratory rate, etc.) can therefore represent a rapid and impartial assessment of emotional responses if used with appropriate control. Therefore, we are faced with the initial question: is it possible to analyse the impact of Digital Design on end users? What tools can help us?

The answer lies in the study of the body experience and the unconscious responses of the users that can be analysed through the study of bioparameters (Figure 3). Bio-parameters can enlighten Design through the specific information that they can provide in terms of end-users bodily responses and perceived well-being. Among the different bio-parameters, those that can be of most interest to design are those that can be measured through non-invasive and wearable systems such as:

- Electrodermal activity (EDA): is an objective tool of stress indication that measures the changes in conductance at the skin surface due to sweat production that is representative of the intensity of our emotional arousal. (Delmastro et al., 2020) (Minguillon et al., 2018) (Kalimeri and Saitis, 2016).
- Heart Rate Variability (HRV): it could be considered a biometric parameter upon which to determine people's stress conditions and it is the standard variation of inter-beat intervals (Elzeiny and Qaraqe, 2018).
- Pupil Diameter: it is a primary index to investigate psychological phenomena since the diameter of the pupil reflects the correlation between its dimension and a human's well-being. When the human body is under stress it induces mydriasis (the pupil expands).

Other measurement systems such as those related to Electroencephalogram, Electromyogram (EMG), Electromyogram (EMG) can also inform the Design on the quality of the end-user experience. However, due to the type of tools need for measurement, would require more invasiveness by highly impacting the end-user experience.

In the design field, the most easily measurable bio-parameter in terms of instrumentation is the HRV as it has a different set of wearable tools that can be used. A summary scheme of the type of tools present on the market and scientifically validated have been schematized in the table below.

TOOL	Other bioparameters
Emotibit	Breathing rate, EDA
Empatica e4	EDA
Scosche Rhythm24	Only HRV e HR
Corsense	Only HRV e HR
Biopac	EDA, ECG, eye-tracking
Polar h10 (chest strap)	Only HRV e HR
Polar h7 (chest strap)	Only HRV e HR

Table 1. *Wearable tools to measure HRV*

Data reading can work if an interdisciplinary approach is taken through the role of the aforementioned discipline of Neuro-Design, an innovative and interdisciplinary field able to understand the immediate and not "filtered" response to the sensations that digital spaces and objects evoke

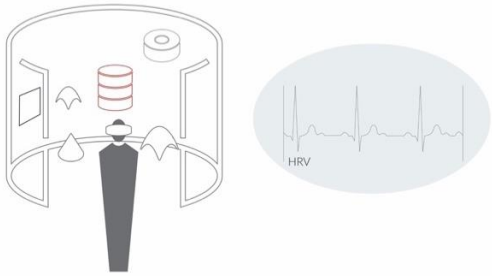

Figure 3. Digital experience and unconscious responses. Eleonora D'Ascenzi Credits Eleonora D'Ascenzi

4. Limits, conclusions and future trends

Neuro-Design could represent a fundamental challenge to effectively and efficiently apply the information gained by Psychology and Neuroscience to study the Digital Design perception and the evaluation of physical and corporeal User Experience. Although Design and Neuroscience seem to embrace two opposing research models, an interesting intersection can be realised in order to understand future research directions and opportunities through the adoption of an in(ter)disciplinary approach that allows for blurred boundaries between the areas of study dealing with human perception, behaviour and corporeal responses by representing the possibility of the design disciplines to interface with the scientific areas.

At the same time, however, the limits of this in(ter)disciplinary approach must be recognised and declared. If in fact, as we have seen, it is complex to define Neuro-Design, it is even more complicated to use a common language between such different disciplines. On one hand, in fact, the world of Design tends, by its characteristics, to adopt a metaphorical language with a subjective meaning and mainly qualitative data, while on the other hand, the sciences are predominantly based on quantitative and objective data. Another limitation of this arising field heavily relies on the lack of tangible implications as well as the few fields of practical application explored so far, due to its recent emergence and general scepticism linked to its prevalent use in the field of marketing. Indeed, body and non-conscious responses are often associated with sales purposes and in some way with 'deceiving' the final users.

In the field of Design there is a resistance to the use of quantification methodology related to fear of a sort of "Data Driven" Design approach in which the role of the designer could become marginal. However, this type of approach should not be considered as a substitute for a qualitative approach, but as integrated method. It is therefore a matter of using a trans-disciplinary approach in which design plays the role of a catalyst and it is able to critically "read" such data with the help of an expert multidisciplinary team composed of,

among others, designers, sociologists, anthropologists, psychologists, neuroscientists and engineers.
Neuro-Design must therefore try to shake off this preconceived idea by demonstrating the real reason for its rise and its primary objective: to work in the leadership of the wellbeing of end-users, by consequently showing the limits and opportunities of Design.
The future trends of this discipline are countless and expendable in various fields of research. Amongst others, it is crucial to emphasise the need to develop a shared language between scientists and designers with as much common ground as possible. At the same time, it is also crucial to start putting into practice case studies, in different disciplinary fields, that aims to demonstrate how body sensations are the first and foremost experiential and perceptive element on which good Design can be evaluated. In these current times of Digital Transition, planning and evaluating design by "listening" our body is a central challenge and a revolutionary act.

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Urban choreographies: a reflection on the design with differently augmented bodies

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ABSTRACT

Starting from the peculiar character of the body and of its role in urban design in the light of the pandemic and the digital transitions, this contribution addresses the issue of urban design made with and for human and more-than-human bodies.

Ongoing global changes lead urban design to adopt a relational approach that returns to the body, in relation to space and to other bodies. In fact, the renewed focus on the corporeal dimension in the post-covid era and, in parallel, the ever-increasing opportunities offered by virtual realities, open up new possibilities to explore and experience urban spaces through differently augmented bodies. The body can be enhanced through somatic and perceptual attention, facilitated by the contribution of artistic-performative practices, or it can be expanded by cyborg effects with various degrees of technological hybridization. Both possibilities can shape a new understanding in the field of urban studies since they enable a complex and amplified experience of spaces. Therefore, the paper investigates some possible ways for urban design to relate to augmented bodies to build new epistemologies and methods: pushing forward a phenomenological approach, sensory and bodily experience is here considered indispensable for reading and transforming the city.

On the one hand, the city is perceived by the body as a set of interactive conditions, and the body itself expresses a transitory synthesis of these interactions recording its experience through an urban 'bodygraphy' (Britto & Jacques 2008).

Creative and mobile methods for urban investigation – referring to the senses, movement and perception – are thus explored: walking methods and artistic-performative practices such as urban dérive and urban dance. They are understood as ways to acquire an embedded knowledge of spaces from which to proceed to design their transformations, but they are also intended as ways for resignifying places, creating new relationships with the community, a stronger sense of affection and belonging, caring for places, etc.

On the other hand, the digital transition allows the expansion of urban phenomenology, constructing a new body-scheme that questions the spatio-temporal categories of the experience of space and using the possibilities of virtual simulation to innovate, create and build alternative futures in the material world (Seibert 2022).

Understanding the body as a living interface between the virtual and the real environment, a post-human creature hybridised with technology, can open horizons for experimentation on different fronts. On the side of designers, who become capable of tracing nodes of an informational network moving in space and mapping a collective spatial intelligence, but also on the side of citizens who are provided with a tool to actively engage with their everyday landscapes allowing new forms of empathy and significance of places.

Using the lenses of the human and post-human body to interpret urban phenomena, this paper also aims to tackle the dichotomy between real and virtual, physical and digital, biological and machinic, proposing a dialogue between these different corporal sensibilities in an attempt to question their claimed antinomies.

From this perspective, the work of the designer becomes similar to that of a choreographer, who interacts with the "life between buildings" (Gehl 2011) and works through dynamic projects that co-evolve with their actors and contexts. The concept of choreography becomes seminal, both for the renewed attention on the performative features of space in terms of body movements and for the

fertile analogy with the design act capable of holding together heterogeneous and moving components.

KEYWORDS
urban design; public space; choreography; augmented body; multidimensionality

1. Introduction

The ordinary practitioners of the city live "down below", below the thresholds at which visibility begins. (…) They are walkers, Wandersmänner, whose bodies follow the thicks and thins of an urban "text" they write without being able to read it. (De Certeau 1980, p. 93).

Dealing with bodies inevitably involves a reflection on transition. The body is a dynamic and changing entity, always in motion and never static. Constantly passing through ephemeral states, it lives in transition or rather it needs to be in transition to live: between physical and perceptual statuses, stopping and passing points, visible and invisible conditions, memories and (e)motions. Nevertheless, a certain degree of contradiction lies in the bodily condition itself, since the body permanently experiences a state of transition – temporary by definition.

Another contradictory aspect concerns the role of the body in modern and contemporary European design culture which has founded its identity on the notion of place, the focus of continuous reflections and re-conceptualisation. Despite this culture having always implicitly dealt with bodies, it has not placed them at the centre of its debate nor considered them as real subjects of the project[1].

However, the transition experienced during and after the pandemic raised the question of the centrality of bodies in space and mainly in the cities, by definition places of coexistence and relations between diverse beings. Moreover, the digital transition accelerated by the pandemic stressed the importance of relationships between bodies, physically distant but networked together.

Starting from the marginality of bodies in the traditional urban design discourse (Bianchetti 2020), this paper reaffirms the experience of bodies in public space, where social practices are performed and shared signification is built. Public space is understood as a mediating ground and field of experimentation of interactions. We adopted a Lefebvrian view considering space as simultaneously conceived, perceived and lived: to comprehend this triad, it is necessary to return to bodies (Lefebvre 1991). In particular, by claiming the possibility for differently augmented bodies to become subjects of the project, the objective is to explore how a multi-sensory understanding of the city can inform urban design.

On one hand, the body is augmented by the expansion of its perceptual attention and, in this light, creative languages such as performing arts practices can increase somatic sensitivity. On the other hand, digital technologies challenge designers to conceive new relationships between space and a 'hybrid' body capable of moving between physical and media environments.

In the condition of 'permanent transition' how can we develop our corporality in space? The relationship of the human being with the living environment consists of continuous interactions in motion of which the body is the interface. An ecological approach to the design of cities can be useful to unveil the potentialities of a space that is «open, multiple and relational, unfinished and always in becoming» (Massey 2005, p. 59). Re-interpreting de Certeau's views quoted above, we believe that this kind of moving body can

be a tool for reading the urban text: through the exploration of diverse forms of embodiment, as designers we need to cultivate a pluriversal understanding of being in the world (Seibert 2022).

2. Re-placing the body in the urban space

The contemporary transition has dramatically emphasised the centrality of the body. The pandemic has displaced bodies in the physical space, in the social space and in the space of control. Moreover, it has displaced them into virtual space as a place of relationships outside the home, where bodily characteristics were secondary to communication flows. Furthermore, this transition also displaces design questions towards a redefinition of the relationship between individual and collective bodies and between them and public space; some concepts have been re-interpreted such as those of proximity and distance, safety and unsafety, porosity and inequality.

Hence, the body becomes the measure of every spatial relationship within the city, where the plurality of coexisting inhabitants' bodies appears (Jacobs 1961). Such coexistence is a political issue and does not elude but amplifies the responsibility of the design project (Bianchetti 2021).

A new challenge for urban design emerges, which consists in shifting the traditional approach to places, understanding them from a relational perspective as a full space between bodies. In order to meet this challenge, phenomenological philosophy can be useful to approach the body as an active, experienced and generative subject (Merleau-Ponty 1945). Also, as cognitive science and enactivism have shown, living beings know through action and movement, and knowledge is always embodied and embedded (Varela, Thompson & Rosch 1993; Nöe 2004). This concerns also spatial knowledge, which is always a situated experience based on the sensory-motor, perceptual and cognitive possibilities of the body.

Therefore, the role of multisensory and kinaesthetic experience gains particular importance in the interactions between the subject and the external environment. This leads to reconsidering the importance of the senses, rehabilitating all of them (and not only sight) as a way of accessing the world, environments and their atmospheres (Treib 2008; De Matteis 2020), also including sensory dimensions acquired through the progressive hybridisation with digital technologies.

The multi-sensorial experience as a method of analysis might allow the designer and the researcher to read community and collective features of public space, like its permeability, accessibility, inclusiveness; it allows to identify zones of conflict or resistance, the level of comfort and discomfort, of formality and informality, the sense of place; and finally it enables a deeper understanding of the relationships between communities and spaces considering their uses, memory, potentialities, needs and priorities.

We intend to use the body as a tool for spatial exploration and transformation, widening the operating principles of the project. Moving bodies can stimulate the urban project just as the urban project can stimulate moving bodies.

3. Enhancing the body through performance practices

Many authors agree that bodily experience in the contemporary city is increasingly anaesthetised (Paba 1998; Solnit 2001; Jacques 2012): by the speed of transport and the pace of life, by the consensual nature of urban projects, by the spectacular and consumerist strategies of urban capitalism (Debord 1967; Lefebvre 1999). All these factors hide the fact that the project does not put the body at the centre (Pallasmaa 2005; Pereira 2009). Moreover, traditional space analysis tools are unable to capture much of the complexity of places (relationships,

conflicts, flows, perceptions, sense of belonging). In fact, although the zenithal view (from the top of the city or from the plan of a cartography) is necessary, it cannot be exhausted in itself (Geddes 1904). This synoptic view from above must be alternated with a gaze from 'down below' (de Certeau 1980) and from within, reclaiming the direct experience of the body through space.

Body and space imply each other and they evolve together: one plastically shapes the other in a process of mutual transcriptions and configurations that are always transitory. The city is transcribed by the actions of the bodies which inhabit it: they do so through spatial practices and performances. In turn, the bodies are transcribed by the city which they inhabit: they carry with them the traces of places as an embodied memory, even when they are no longer there (Pereira 2009). The body interacts with urban conditions and, in doing so, incorporates them by recording a kind of cartography: a "bodygraphy" (Britto & Jacques 2008). Thus, if space remains inscribed in the bodies to the extent that space itself becomes a body in some way, then the designer's study of urban bodygraphies can provide information and data about the city.

Considering all this, the alternative to the impoverishment of sensibility in urban practice passes through the re-appropriation of bodily experience. The use of creative and mobile methods for urban investigation, combining approaches from the performing arts as well as sociology, anthropology, ethnography, can expand the traditional tools of spatial analysis and design to 're-sensitise' the urban experience.

The first way of experiencing the city through bodily movement is walking. Practicing the city by walking generates a specific spatial learning, which is a subjective, ludic and empathic knowledge. De Certeau calls it 'blind' because it is a non-conscious, embedded knowledge, linked to touch - to action and movement - rather than to visual images or urban representations. Since this 'blindness' is valuable for learning about the city, walking methods can be used as a knowledge tool and research method. Walking, in the form of drifting, wandering or «transurbance» (Careri 2006) can reveal information about the territory that is useful for redesigning it, but not readable from the surface of a map. Furthermore, walking has a close relationship with artistic practices and can be understood as an aesthetic, environmental and itinerant performance (Paba 1998; Solnit 2001; Careri 2006).

From this perspective, the experience of the walker can be associated with that of the dancer (Jacobs 1961; Jacques 2001; Chêne 2006) and understood as a counterpoint to dance, especially when the urban topography determines routes of ascents, descents, detours, pauses and accelerations (Coquelin 2022). Indeed, every dance and in general every urban performance works with the manipulation of space of which dancing bodies are generative (McCormack 2008). By performing, the body expresses a certain way of displacement in the urban fabric that depends on the specific conditions and relations with the environment (Britto & Jacques 2008).

Therefore, performing arts practices can be a tool to explore spaces through moving and augmented bodies to closer understand space conditions and relationships. At the same time, these practices can also be a tool for modifying the space conditions, establishing new relationships and producing new interactions through choreographing or designing spaces. That was what happened in 2022 with the project 'Sulla Soglia', a co-design project of the Mare Memoria Viva Urban Ecomuseum in Palermo, Italy. Mobile methods, in the form of walking and performance, were applied to explore, design and enhance the underused spaces around the museum, situated in the southern outskirts of the city. Through walking crossings, understood as transurbances and

drifts, conducted to analyse the territory from an urban and social point of view, design actions were conceived referring to the specificities of the neighborhood community and in order to invite it to use these spaces, distinguished between spaces for rest, meeting, play and movement. The design ideas were delivered in the form of a video-performance, rather than technical drawings[2].

As it amplifies sensory learning of spaces and simultaneously reveals their affordances (Edensor & Bowdler 2015), performing arts practices can help urban design to choreograph kinaesthetic experiences. In this respect, a significant example is offered by the enlightening experience of the landscape designer Lawrence Halprin. From the careful and repeated observation of his wife Anna's dance movements, Lawrence has 'choreographed' performative experiences with his designs of spaces, seeking to make them spaces for movement and to strengthen the awareness of the body in space (Wasserman 2012).

In this light, the practices of walking and performance become attempts to decode bodygraphies, since they both extend the sensitive repertoire and put an emphasis on the subjective and affective component. A deeper learning of urban complexity arises from these common aspects, based on a double level of perception: attention of the body to the environment and, simultaneously, attention to the body in the environment. This immersive bodily experience uncovers hidden potentials and possibilities, re-writes spatial relationships, re-signifies space and produces a new sense of place.

Thus, walking and performance become acts of micro-resistance to the spectacularising and anaesthetising urban logics: they are deliberate choices of deceleration and recontextualisation with the rhythms of the city, which enrich the perceptive experience and resocialise it (Jacques 2012; Coquelin 2022). The sensory-motor experience of the city inscribes itself in those who practice it through movement, and thus survives inscribed in their bodies. Founded on proprioceptive and exteroceptive attention, performing arts practices thus provide a possible key for reading and consciously rewriting the 'text' that is the city (de Certeau 1980; Ferraro 1998).

Figure 1. *Sulla Soglia*, Ecomuseo Mare Memoria Viva, 2022 (Palermo)
Author and credits: Mare Memoria Viva

4. Augmenting bodily experience through digital technology

This dynamic experience of the city so far described is written by a variety of movements, traces, memory, empathy towards the everyday space of life, all entwined in a non-visible stratum: an informative layer which pervades and writes the palimpsest of the urban space. the progressive embedding of mobile digital tools in bodily experience of space can be used as a tool to read and operate on this text.

Part of the responsibility to observe and interact in urban environments is today inevitably shared with information technologies. Cloud platforms, mobile apps, the Internet of Things make a machinic specie of their own, coevolving with biological species with different degrees of hybridisation (Bratton 2016). The topic itself is not new: since the rise of robotic science, the integration between human body and technology has always been fertile field of experimentation, nourished also by literary

and cinematographic imaginaries. However, what is new is the rapid growth of the phenomenon in the last two decades, which is making our bodies, variously augmented with technology, new actors in the urban space.
Digital mobile devices accompany us in our everyday lives, following every movement we make, becoming extensions, technological prosthetics which make our body a hybrid device (Case 2010). The possibility of transitioning from virtual habitats to physical ones – both realms which allow bodies to move, communicate and interact – makes the body exist beyond its finite physical boundaries.
At a first glance, inhabiting a world of topologic and immaterial relations raises the topic of the disappearance of the body (Foucault 2008; Bianchetti 2020), apparently supporting the idea of anesthetization of the urban experience and contributing to a deterritorialisation that separates flows from places (Deleuze & Guattari 2017, Turri 2001, Appadurai 2012). On closer observation, however, this body is a living connector between two realms, embodying a state of perpetual transition between the material and intangible layers of space.

This implies a reflection on the possible different types of corporeality that can be observed and fielded in the work of the designer. The hybridisation with devices making us everyday cyborgs (Case 2010; Ratti & Claudel 2017) can be assumed as an interpretative tool of public urban space.
The cyborg body is firstly a *medium of observation* with both a human and non-human gaze, augmented by a technological filter that alters the perception and the way of experiencing space, with implications for its uses and for its processes of signification. It is inherently endowed with a transcalar view, in which the planetary and the individual scale meet: from above, a gaze that allows the tracing of human movement in space; at eye-level, an augmented perception vehicle for a customisable, simultaneous, synchronous experience of different space-time dimensions. The two views operate in a complementary way, materializing a paradox of lived space, an everyday condition in which experience transcends the body allowing it 'to map its position in an external world' (Jameson 1989). From above, the collected data allow us to identify the interactions triggered, from below we can read the hybrid uses, “socio-technical acts” that take place in the public open space and contribute to the co-creation of the city (Del Signore & Reiter 2018).
The cyborg body is a *medium of transmission*, a moving node of a planetary informative network that we engage with through connectors of various nature and in different physical-spatial bodily conditions. As ‘hyperconnected citizens’ (Müller & Vivaldi 2010) we carry embodied technology and situated knowledge (Haraway 1991) and in doing so, we co-create a thinking space (Gandy 2005). Our daily interactions on the virtual level feed a collective spatial intelligence - which not only is a collection of single, personal inputs and interactions, but also a network of ‘moving nodes’ in the form of virtual communities, able to collect the needs, share imaginations, create a sense of place, share practices.
In relation to this last concept, the cyborg body can become *medium of single or collective action* in the space of the city, able to actively warp experienciality or ignite interactions with other devices and other cyborg bodies which populate urban landscapes. In its cyborg space, the body operates through objects and codes specific for the communication between devices, which the human alone cannot use (i.e. QR codes, mapping points etc). At the same time it maintains its very corporal sensorialities, generating a hybrid, digital synesthesia while performing in space.
From a design perspective, the sensoriality augmented by digital visualisation and

interaction technologies can generate forms and meanings that stimulate imagination, for example through immersive representations where "senses can be extended, time can be re-mapped and empathy can be transposed to the design" (Seibert 2022).

This mobile technological filter can open different levels of mediation between the body and its environment, a spectrum of interactions with different degrees of agency, from the more intangible (i.e. selecting options on virtual reconstructions) to the more physical (i.e. changing the features of space for different uses, modifying climatic conditions etc).
The use of these tools helps in better understanding the complexity of public open space and can contribute to the communication of the project, engaging the citizens in the transformation processes. For example in the project 'ID-Exe', developed for Milan Design Week 2021 by the start-up company DOS - Design Open Space, so-called 'Activator Pixels' were spread around popular locations of Milan (squares, boulevards, pedestrian bridges, stations etc). The pixels - consisting of big adhesive QR codes placed on the paving of public spaces - would connect users to original Instagram filters designed to visualize works of digital art and urban furniture on display at the Milan Design Week, opening the possibility of placing the virtual replicas in specific points in the squares. Collected data were used to understand people flows during and after the event and preferences on the type and location of the proposed urban furniture in a specific urban environment (Figure 2). Also, introducing the lens of the cyborg body for urban design does not necessarily require the creation of new software; instead very common and already existing tools - like Instagram or platform apps - can be used to understand the new, *filtered* relationships that we are building with space everyday through our portable devices.

This interpretation can help to reaffirm the strong connection to the physical space of the city, that's the primary generator of virtual-physical interactions, hence the opposite of dematerialization. Through the powerful and widespread technological tools we become capable not only to write the city, but also to visualize and operate in the text that the city is.

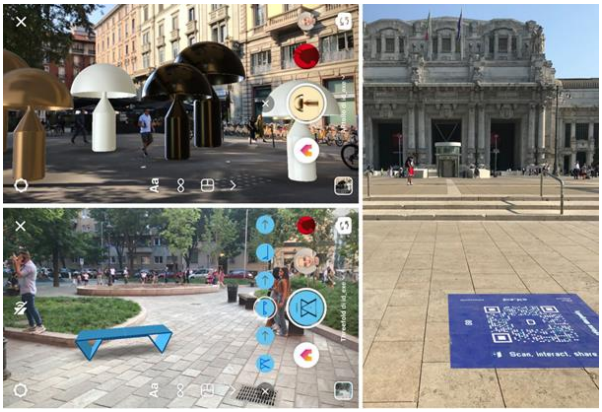

Figure 2. *ID Exe*, Milan Design Week 2021 (Milan). Author: DOS - Design Open Space. Credits: Eleonora Giannini.

5. Understanding the project as a choreography

Both the approaches described are forms of immersive interaction that question the common urban experience and expand it. They imply a wider range of senses by proposing a multi-sensual engagement with space, objects and other bodies. They share a common ground which is the attention to the body in motion as the focus of the urban experience, performing in multidimensional ways.
"Only after programming the movement and graphically expressing it, should the environment – an envelope within which movement takes place – be designed. The environment exists for the purpose of movement" (Halprin 1972, pp. 208-209). As theorized by Halprin, the design of public spaces should be performative and stimulate possibilities for bodies to experience spaces kinaesthetically. Indeed, this kind of experience produces an embodied knowledge

inscribing onto the bodies the memory of places, where the latter can be revealed through the study of urban bodygraphies or visualized through a technological lens.
Augmented bodies' experience of the city challenges their common uses, reveals their unexpressed potential through imagination and leads to the re-signification of places.
The project of public space should keep together both the vision from above and the view from below (Geddes 1904), enriched by the heterogeneous bodily dimensions, temporalities and materialities for a profound understanding of spatial dynamics. In order to achieve this, the project needs to be transmedial, using diverse tools for spatial analysis, representation and communication. Respectively, among the others: mobile methods in conjunction with video, photography and art-based forms of documentation, walking methods in conjunction with audio transcription, GPS and video cameras for enabling the researcher to collect real-time, multi-sensory information. Among the methods of representation and communication of the project, some examples can be body-mapping storytellings, performances and dances on one hand, and on the other hand virtual models, immersive reconstructions and location-based platforms (such as polls or urban gaming).
At a closer look, the design operation is not conceptually distant from the performative-artistic operations. In order to work with the permanent conditions of transition that is intrinsic to the body, we can think of the project as a *choreography* (Britto & Jacques 2008, pp. 79-80) and of designers as choreographers with a kinetic approach to movement through the space (Corner 1999; Wasserman 2012).
Firstly, we suggest this analogy because choreography is "the art of composing dances for the stage"[3], in this case the art of designing (e)motions for the stage of the city, dynamic field of human everyday choreographies. Secondly, because a choreography keeps together heterogeneous, mobile and transitory elements in a dynamic framework, tracing their relations and addressing the conditions of their future co-evolution. And lastly, because choreography, like design, consists also in a graphic notation, being "the technique of representing dance movements through a notational scheme".
"At the scale of the human [and more-than-human] body there is a kind of choreography of movements in various kinds of assemblages and constellations" (Sheller 2018). Understanding the project as the choreography made by and for augmented bodies and experimentation in the application of these methods might contribute to future development of research for a design of public space that is open, dynamic and adaptive.

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The field of play: socio-spatial narratives of amateur football in the diffuse territory of northern Portugal

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ABSTRACT

If we think in the relation between football and architecture the first picture that comes to our mind is maybe the image of a soccer stadium – a space located inside city where a mediatic and professional football took place. However, that is all this work isn't about. This research convokes the other side, the other football, the other territory. The small football played in fields of the diffuse territory by amateur actors.

Regulated through the first of the 17 Laws of the Game instituted by FIFA, the space designated "the field of play" is perhaps the only common aspect between both stadium and field, repeating the spatiality, but not their dimensions, orientations or types of surface. While the stadium playing rectangle has the recommended requirements for soccer practice, the field has the minimum conditions. The stadium is an architectural object of great programmatic complexity, but with reduced typological variation. In turn, the field has minimal or non-existent facilities, but at the same time infinite typological variations.

Stadium and field are further differentiated in the relations that each establishes with the outside. The stadium is closed on itself. The field lives from the constant communication with the exterior. In other words, the stadium is defined by its limits; the field, by its relations. The stadium is usually a finished project, duly regulated. The field is an open project, of great versatility and improvisation, an unfinished and permanently unstable construction.

The stadium is a stage for mass and media events such as soccer matches but also music festivals or car races. The field is, above all, a physical support for sociability, a collective and sharing place where the game often becomes a mere pretext for a meeting. In this context, the bar emerges as a space that stimulates other practices related to popular traditions that contribute to understand not only the variability of occupation of the field, but also its identity construction.

"The field of play" is therefore a study that aims to reflect on the uses of soccer fields in the diffuse territory of northern Portugal and is based on the research work started in 2014 and presented in 2017 as final test of the Integrated Master in Architecture at the University of Minho in the City and Territory knowledge area.

In this proposal, the field is the trigger for reading the socio-spatial dynamics of places and territory, intending, not only to recognize the multiple forms and functions of the field that are cyclically being replaced between football and social uses but also to frame the relations and transitions between field and its surroundings over time.

To defend and sustain this analysis, we took a sample of 54 soccer fields where more than 60 football clubs and other sports and cultural collectivities are based. Considering the municipality of Guimarães (a small city near Braga and Porto) as a background, the geographical area covered by this sample results from the identification and location of the 54 fields discovered within this administrative boundary and embrace a territory that includes 36 of the 48 villages in the municipality. An area that matches with the diffuse territorial occupation model where more than 2/3 of the total number of inhabitants of the municipality lives – indicator that not only let us know the relevance of this settlement model in the territory of Guimarães but also allows us to recognize the field as one of its identity marks.

KEYWORDS

amateur football; diffuse territory; popular culture; collective space

1. It's geometry's fault

These fields metaphorizes a territory of paradoxes and contradictions. Since there is always a rectangle, the only fixed element, everything else changes. Thus, contrary to what one might expect, not even the playing field itself contribute to uniformity. Starting in the measures and orientations that differ from one pitch to another, the existence or not of a spectator's seats, a locker room or a bar gives this sports equipment countless morphologies and typologies.

Although it is highly recommended that the pitch measures 105m x 68m[1], there is not a single case in this sample that meets this condition. In fact, there are not even two pitches with the same length and width. The nearest measures are the minimum requirements: 90 meters long by 45 meters wide. If, in theory, *this is one of the factors that makes playing at home an advantage, because the home team can evaluate distances more accurately than the visitors;*[2] in practice, the poor domestic results of the Black Eagles of Tabuadelo are justified in other perspective - blaming geometry: *"Our pitch has small dimensions. Usually people come here, or clubs come here a bit closed... we try to win because we usually play attacking, but they have almost always beaten us on the counterattack*". Who says that is the president of the club himself, Paulo Oliveira.[3]

Simultaneously to the dimensions, the disposition of the rectangular shape in places is also paradigmatic of the contradictions present in the criteria (or lack of them) related to the implantation process of the field. *If oriented East/West, the playing field often becomes an adversary at the height of the matches. Especially when they drag in the afternoon, with the sun in front of the forwards eyes or the central defenders, if on the other side*.[4] For that reason and given the fact that almost all the matches are played in the late afternoon, the north-south orientation would *often be considered ideal*.[5] However, there isn't a predominant orientation that reduces the influence of this component in the game. The pitch shoots in all directions, even the most inconvenient.

The dimensions and dispositions of the various support programmes for the field don't have the rules by which the space between the four lines is regulated. If in what concerns the playing rectangle the set of constraints is not followed at all; in this programme - "without rules" - the formal and functional variations are unlimited. Divisible in two categories - sportive and social - these spaces attend to specific needs of the field that suggest a complementary and supporting relationship, not only to the sportive activity of the clubs, but also to the social life of the places.[6]

The sports programme is almost exclusively linked to football practice, from training to competition. The changing room, spectators' seats, ticket office, secretary, cloakroom, massage room, gym, trophy room/museum, etc. are some of the spaces involved in the equation. Based on the communication and contiguity between the two-dimensional surface of the playing area and the three-dimensional structures of the support programme, through users we can understand how these spaces works. The spectators watch the game from the seats, the players equip themselves for the game in the locker room, the directors and managers prepare it in the offices.

Figure 1 – Ases locker room (source: facebook.com/ases.sta.eufemia/)

The social programme introduces other practices to the field that complement football. Therefore, it doesn't establish a direct relationship with this game, but with others, such as card games or billiards. The bar emerges here as a central space in the social dynamics of the field among a wider set of areas that may or may not include a clubhouse, games room, party room, stage, among others. In the absence of this additional programme, it is the bar that absorbs the functions proposed by the others. As in the sports programme, its users are not limited to the intervenients of the game. This space attracts everyone from the players' families to people to whom football is no interest at all but live around it and goes there. After all, as "Engineer" Magalhães (an unconditional fan of the bar) says: *"What matters is to eat well and drink. Football doesn't fill the belly."* [7]

1.1 The secret is randomness

A "Globo" freezer or another removed from a sales van, a *roulotte* or container, a shack, a garage, an entire floor of a building, etc. From the most elementary portable objects to the fixed building, the bar is the programme that best sums up what can be found in field outside the playing rectangle condensing all the complexity and variability of the set-in sample.

In São Cristóvão, the container adapted to a bar simultaneously serves to store club material. Although bought by the president of the parish council for 3250€, it's Mr. Joaquim and Mrs. Maria José (respectively barman and cook) who, during match days, are in charge of making the beers and "bifanas" (pork steak on bread) business.[8] Tables and chairs are spontaneously placed in the nearby area of this bar-container, improvising a terrace with a privileged view of the pitch, which at the end of the day completely disappears and the material is collected into the container.

The scenario set up as a bar in Nespereira consists on a versatile construction of precarious character and improvised appearance. It's an ephemeral structure that can easily be removed or demolished and consists only of a metal roof, housing a fridge and a wooden table that serves as a bar counter, where the cook on duty is José António - who makes a point of revealing the secret of his recipe for "bifanas": *"you put the "bifanas", the "bifanas" sauce, laurel, salt, chilli, a beer, then cook for three quarters of an hour, half an hour, it depends"*.[9] For Lázaro, roaster of Longos club, the secret is randomness: *"this is a bit of luck, isn't it... this is a bit of luck because normally I'm not the one who eats them…"*.

At Abação and Matamá fields, it's the space initially built to store the clubs' vans - the garage - that has been converted into a bar. A space with the capacity to be simultaneously several, i.e., where different functions mix and coexist from bar, trophy room or clubhouse. In the first example in particular, the proximity to the pitch will further increase the versatility of the use of this bar-garage, which can also be used for dinners or other sports events, musical and religious festivities. The extension of the indoor compartment to the outdoor space is made through temporary structures of quick assembly, which allows to adapt and accommodate an added area to increase the capacity of tables and chairs, since the small dimensions of the garage prevent it from receiving all the guests.

At the final whistle, the focus shifts from the ball to the plate. That is, to the bar (or should we say *snack-bar restaurant*[10]?), *where challenges are followed by dinners*.[11] For example, Manuel has little interest on the outcome of the game, whether in favour or against the colours he defends, as he emphasizes: *"the best is the half-time break and the third half... up there in the association, the plate full of meat..."*.[12] The bar is one of the few sources from which clubs get some income. Although it is on match days that they make the most profit, their opening hours are often extended to every day of the week. Paid or unpaid, the barman is often the club's only full-time employee.

Figure 2 – Bar fans at Urgeses club facilities (source: facebook.com/amigosurgeses/)

2. Between daily training, weekly games and annual parties

The design of a table comes to mind. It should be designed with potential. It can be a social attraction, a platform to be on, (...) a table for dining, writing, exhibiting, creating, reflecting. It should have the potential for uses and meanings not necessarily predicted at the time of its design.[13]

Defined for the specific use of the football game, or rather, designed based on the rules applied to its use, the field receive, not only inside but also outside this practice, a multiplicity of appropriations and meanings.

Between daily training and weekly games, each field is occupied on average about 30 hours per week and remaining 138 hours being empty: *empty as absence, but also as promise, as encounter, as space of the possible*.[14] However, that use depend on the surface and as determined by the rules, the surfaces of the football fields can be natural or artificial.[15] Among the natural ones are the types of dirt floor - commonly known in football language as "pelado" - and the natural grass. In the artificial ground, only the synthetic turf surface is worthy of mention. Thus, besides showing different textures, each type of surface reacts in a particular way to the actions that are superimposed upon it.

Figure 3 – The field of play surface (author's image)

"Pelado" is the immediate result of a topographic transformation caused in pre-existing soils, which in turn define the categories of each floor - while the agricultural soil is associated to a softer ground, the forest land originates a harder type of base. This division has some influence on football practice to the extent that, tendentially, in this territory, each of the soils is linked to a low level - agricultural - or high level - forest - and, in this sense, the former is privileged in relation to the latter for having a soil originally less aggressive. Even so, the number of fields set in forest soil is paradoxically higher than those occupying agricultural soil, 30 and 24 respectively.

In these fields, the only permanent marks literally rooted in the ground are two posts on each side. The marking of the lines is manually drawn with the help of a sort of wheelbarrow (specifically kitted for the purpose) that releases lime as it moves during the process,

consecutively executed whenever there is a game to avoid the risk of it disappearing during the game. When rains it's almost certain that at the end of 90 minutes of play these borders are barely recognisable.

Potato field, heavy field, bathtub, swimming pool, muddy field[16] or mudflat are all terms that popularly designate the fragile state of the surface exposed to these weather conditions. Due to the excess of water, the earth floor is transformed into mud making any use of it unviable, but not impossible, as players never give up trying to play a sport that resembles football. Back to Tabuadelo, to justify the poor state of the ground, the adverse meteorology is added to the recent history of use of the field for "malha" championships. João Pinto, the team captain, has no doubts: *"... there are the tournaments of "chincalhão" and then the land is all up and they put more earth on top to remedy this and then this earth is not trodden on, nor a cylinder passes over it and then it stays in these conditions that we saw now".*

The inverse of this does not bode well either. In long periods of hot, dry weather, the ball, which used to stop in the mud, is now hidden amongst dense clouds of dust to those watching from afar. However, these football pitches are the cheapest, least maintained and those where the greatest number of players are allowed to play. Therefore, they meet the most requested criteria (which are both possible and minimal conditions) for most of the pitches in the sample.

The natural grass pitch contrasts with the dirt field. It is the one with the best conditions for football practice, the most expensive, the one that requires the most maintenance and, finally, the one that requires the least intensity of use - a circumstance that forces it to be practically restricted to training and matches of a single team - there being, for these reasons, only five pitches with this type of surface. While it is usual for grass or other types of vegetation to grow on grass pitches, the grass disappears. As a result of lack of maintenance, these fields often become hybrid surfaces that mix the most diverse textures.

Figure 4 – Hybrid ground at Castelões football pitch (source: cacasteloes.blogspot.pt/)

In the "pelado", the playing area is designed, erased, and then redesigned according to its intended use, thus working almost like a picture constantly rewritten at each lesson. On Saturdays, in the Game Field of FC Prazins and Corvite, the surface is usually marked for a game of the youth team in the early morning and then manipulated for the main team in the afternoon. Also in football, and although it almost always happens match by match, this versatility of the surface can also arise from one season to another. In Donim, the local club indefinitely suspended the activity of the senior team, thus leaving the use of the field exclusively to the younger levels of training - where before there was a rectangle for 11-a-side football, now there are two 7-a-side rings. The same principle is applied in Gémeos, but in this case replacing the football game with another - *the cow game*. Inspired by FIFA rules, its regulations, besides the grid marks, include the intervention of a referee who, at the end of the game, decides to whom the prize should or should not be given.

The limit described in the rules and inscribed on these surfaces is, like the game itself, a *fictitious limit*[17] - which only exists in response to a precise activity. The fact that it is represented by lines drawn on the ground, gives it a simultaneously fragile and volatile condition - the fragility because they are easily

erased marks and the volatility because can be quickly changed.

Figure 5 – *The cow game* (source: facebook.com/grupodesportivo.gemeos/)

2.1 Summer sports

The football calendar contributes to the demarcation of the times and horizons of everyday life.[18] If during the season we witness the routine of the players who participate daily and actively in the preparation of the duel with a rival team and those who go to the pitch every weekend to support the home team or simply to meet up with friends; it is in summer, when there is no championship (between June and September) that the field becomes a place of several events organised by clubs, parishes, parish councils or even by the local community itself, which sees here one of the few possibilities of leisure, meeting and sociability, but mainly because it recognises its great adaptability.

From popular festivals or *"chincalhão"* tournaments to religious celebrations or *zumba* dance floors, mixing animals, cars, stages, audience and, of course, food and drinks, everything has its place in the field. The animals - like cows, cockerels, or rabbits - are prizes in lotteries or tournaments; the cars are parked in front of the stage and the public is spread around the field, some even in a drive-in regime.[19]

Figure 6 – Zumba dance floor during the celebrations of the 24th anniversary of Atães club (source: facebook.com/ataesfc.ataesfc/)

In none of these cases does the concrete structure change under the influence of its new function - and therein lies a crucial point: the form can adapt itself to a variety of functions and of assuming numerous appearances, while remaining fundamentally the same.[20] Materialized in objects such as tables, stages, tents, or awnings that are easily assembled, these prostheses appear and disappear from one day to another according to the needs of use.

Finally, in September, when the soccer championship restarts, the field recover its predefined function. The demarcation of the football season determines cyclical, overlapping processes, repeated weekly and annually, which demand successive changes of use of this space. The calendarization of the days and times of training and games establishes a framework of the weekly occupation times of the football field and the season calendar that separates the months in which there is competition from those in which there is not defines a new narrative in which other uses come to reinforce the collective potential of this place, transformed into a social field.

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Track 2 | BOUNDARIES

Global networks, territories, cities, and various spaces of interactions are transforming and hence the boundaries between people and objects, spaces, and different relational dimensions are challenged.

How can we take account of these changes on the larger scale? How are these spatial realities adapting and changing with respect to the current challenges (e.g.,digital and climate-neutral transitions)? We seek contributions addressing strategies and their spatial territorialization, aiming to understand how transitions are concretely realized and how they change territories, objects, and relations with human beings.

Design and infosphere projects and communicative artifacts in the fourth revolution

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ABSTRACT
With the ever-growing dominance of the Information and Comunication Technology (ICT), we have been observing, for many years, the distortion of the entire human experience and of our society, which increasingly depends on intangible goods and services based on information. Interaction with information and technologies distorts the daily experience, also in the individual's life, acting on the profound sense of personal and collective identity. Floridi (2017) calls it a scientific "fourth revolution" (after the Copernican, Darwinian and psychoanalytic ones) and he thinks that it is "creating" a new world dominated by information in which humanity can enter, together with other agents, and in which the separation between the "real" world, offline, and the one opened by ICT, online, is getting smaller and smaller.

Within this scenario of digital transition and hybridization, there have been several transformational thrusts in the world, for some years now, driven by an original mix of technological, social and cultural innovation. Many of these belong to the domain of design in its most contemporary and broadest sense, and move on a border territory, certainly transdisciplinary within which the degree of complexity always becomes higher.

The transformative process implemented by the increasingly widespread awareness of the collective and relational dimension of the infosphere (Floridi, 2017) therefore opens up new and more challenging scenarios for design and its intrinsic dynamics of change and innovation. On the one hand, "the transformation of digital technologies from commodity to utility, on the other, our living in the two worlds - the real and the virtual (Lanier, 2017) - now collapsed in an osmotic way, impose a new right of citizenship in the contemporary world" (Bollini, 2019-2020, p. 59). In this experiential continuum, we are witnessing the overcoming of the human-centered approach in the direction of a new inclusive dimension of the project that places at the center not only people, but all informational agents (natural and artificial), all protagonists on an equal footing in participatory design processes.

The contribution is articulated within a theoretical framework which is followed by some innovative emblematic design experiences that enter into strong correlation with these issues (Floridi, 2017, 2020).

KEYWORDS
infosphere; fourth revolution; design and data, datapoiesis; connected heritage; digital humanism

1. Introduction

Technology is radically changing the world. We constantly use the word "revolution" to describe the powerful and massive transformation that Information and Comunication Technology (ICT) is bringing on the different aspects of human life and its habitat. According to Luciano Floridi, the responsibility for the revolutionary changes we are experiencing should not be given to a specific technological product (computer, internet, etc.), but to the information processes which, so far, have historically developed "slowly" together with human beings. Floridi (2017) calls it a scientific "fourth revolution" and he thinks that it is "creating" a new world dominated by information - the infosphere - lived by many information technology agents. “We are information bodies (inforg), mutually connected and part of an information environment (infosphere), which we share with other information agents, natural and artificial, that process information in a logical and autonomous way” (Floridi, 2017, p. 136, self-translation). Not cyborgs incorporating technologies that can improve or increase their capabilities, but hyper-connected entities and "semantic engines" that create a new sphere of interaction in which humanity can enter, together with other agents, and in which the separation between the "real" world, offline, and the one opened by ICT, online, is becoming smaller and smaller.

To define this new dimension, Floridi uses the neologism *OnLife*, a condition that represents the hybrid nature of our daily social, communicative, work and economic experiences, perennially connected in a continuous relationship between material and concrete reality and immaterial and interactive reality. This condition subverts our frames of reference and forces us to rethink new conceptual tools to “decode” and “recode” this new world.

2. From *philosophy as conceptual design* to *semantic* and *datapoietic artifacts*

According to Floridi, one of the new conceptual tools to “decode”/“recode” this new world is philosophy, but it must come out of its self-referentiality to land towards a more pragmatic dimension, or a design-oriented philosophy: "philosophy as conceptual design" (Floridi, 2020). The information society is more appropriately conceived as a "neomanufacturing" society in which information is a "raw material" that is simultaneously produced and consumed. In this society it is fundamental to focus on the "knowledge of doing", that is a type of knowledge possessed by those who know how to design and produce a new kind of artifacts, that is, "those who know how to create, process and transform information" (Floridi, 2017, p. 123, self-translation). The keys to understanding this situation and developing a sustainable infosphere lie not only in communication and transactions, but in the creation, design, production and management of information.

Here it is very interesting the strong connection to the design theories and culture, emerged, in recent years, from the scientific debate around the design disciplines. The reference is to the socio-technical-cultural change induced by a renewed value around the "knowledge of doing" that origine the debate on digital craftsmanship (Sennet, 2012; Micelli, 2011), the makers movement (Anderson, 2013), open source and co-design culture (Ciuccarelli, 2008), etc.; up to the "we are all designers" (Manzini, 2015), that is "a world in which everybody constantly has to design and redesign their existence” (Manzini, 2015, p. 1).

This hybrid nature of us "inforg", related to the importance of "knowledge of doing" become for Floridi the characteristic elements of an innovative and revolutionary approach to philosophy; a new "practical" philosophy that is rooted in the resolution of Platonic "dogma", that is, in overcoming the

dichotomy between *techné* and *epistème*, practical knowledge and theoretical knowledge, and in the consequent shift of what Floridi characterizes and defines "philosophy as conceptual design", towards a "constructionist" approach: "user-based knowledge approach [...] to manufacturer-based knowledge approach" (Floridi, 2020, pp. 97-98). A "constructionist philosophy" that opens to disciplinary approaches specific to other fields of knowledge (computational theories and practices in particular)[1], including design, which not only "know", but also "build" the object of their interest. "Then to know a phenomenon, an artifact or, in our case, to obtain information and be able to realize it, means to be able to produce and reproduce, compose and decompose, build, assemble and dismantle this phenomenon, artifact or information [...] So that knowledge is possible, *mimesis* must be replaced by *poiesis*" (Floridi, 2020, p. 109). For Floridi, therefore, the philosopher, like the designer, is "a constructor, a poietic agent" (Manna, 2021), that can create a new kind of "constructionist" artifacts, material or immaterial, that are able to generate new knowledge: the "semantic artifacts" (Floridi, 2020, p. 110). These artifacts, conceived through the constructionist approach or *philosophy-design*, produce many contents (not only philosophical, but also scientific, cultural, religious, artistic, etc.) that, together, constitute what Floridi defines as "semantic capital", that which gives meaning to "our identities, lives, experiences, interactions and representations of the world" (Floridi, 2020, p. 134, self-translation). To do all this, philosophy must be "conceived as the highest form of conceptual design" (Floridi, 2020, p. 122, self-translation); a *philosophy-design* capable of elaborating the concepts necessary to improve our faculty of understanding, helping us to know, build and use the next (digital) or present (analogic) generation of "semantic artifacts" (information).

Undoubtedly belong to this kind of "semantic" and "informational" artifacts, a series of projects, research and experiments that, for some years, carry out two italian researchers/ teachers, designers/artists and hacktivists: Oriana Persico and Salvatore Iaconesi. It is a new kind of hybrid and "boundary" artifacts (analogic and digital), that Iaconesi/ Persico define "datapoietic", or objects (material and/or intangible) generated by data and computation, which enter into strong relationship - in reticular, inclusive and peer-to-peer form - with different entities or agents strongly interconnected with each other (nature, people, communities, institutions, objects, data, artificial intelligence, software, etc.). "They are not only technical artifacts, but also cultural and existential ones, as they dive deep into contemporary culture and in human perception and understanding, creating new opportunities for social imagination" (Iaconesi & Persico, 2019).

2.1. Case study | *U-DATInos*

In relation to the themes and issues presented in the previous paragraph, the *U-DATInos-Sensitive to water* research/project experience (built in Palermo between 2019 and 2020) is particularly interesting and innovative. *U-DATInos* (from ancient Greek "*Aquatic. Consisting of water. In water*") is an "info-aesthetic" and a "fragile technology" artwork, halfway between a "meditative" art installation and an augmented design artifact (Figures 1-2).

1 Here reference is made to *Constructionism theories* by S. Papert, which proposes the activities development to constructing artifacts that act as learning facilitators. "According to Papert, children, but also adults, learn better when [...] build their own projects, [passing] from a status of "consumers" of information, to that of knowledge producers" (Capponi, 2008, p. 47, self-translation). Today, Papert's pedagogical model is widely used in many educational innovation activities.

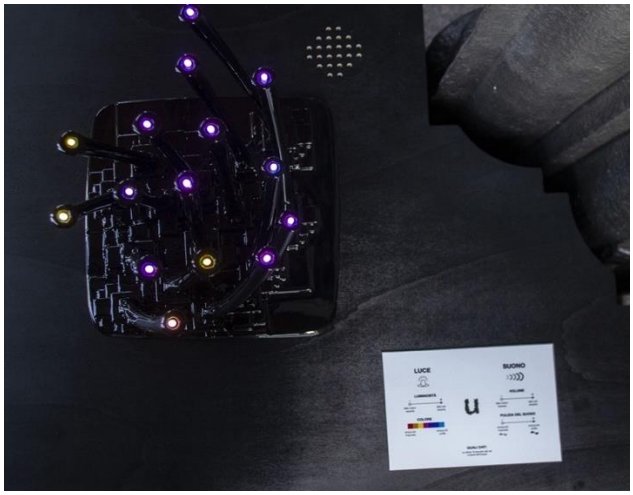

Figure 1 - 2. *U-DATInos*. Iaconesi and Persico. Credits: HER srl

A new, fragile form of digital life that only survives if it is constantly fed by data about a river (Oreto River in Palermo) collected by *Custodi dell'Acqua* - water keepers (citizens, researchers, activists, etc.) - and that an algorithm transforms into lights and sounds (Figure 3).

Figure 3. "*Custodi dell'Acqua" on the Oreto river in Palermo*. Iaconesi & Persico. Credits: HER srl

A new kind of life, a sort of living digital plant, belonging to an unusual ecosystem, within which coexist, in a new delicate balance, all the actors strongly interconnected with each other: the well-being of the river, the Custodians and *digital plants*[2]. It is an innovative kind of hybrid "datapoietics" objects, that, in a strongly and bi-unique relationship of coexistence environment-society, are configured as floridian "semantic artifacts" that mix technology (data, sensors, cards, etc.), innovative design practices and processes (speculative design, design for Future, etc.) and new cultural approaches based on open source, collaborative and active citizenship logics. The project[3] involves a sensitive area of the city (south-east coast of Palermo and river Oreto) on which there has been for several years the *Ecomuseo Urbano Mare Memoria Viva* (Urban Sea Memory Living Eco-museum), a young and dynamic institution that, with innovative managerial approaches, has become a cultural, educational and social presidia, crucial for the territory. As Settis (2002) says, a "marker of identity" and fundamental connection hub between city and community; a sensitive and

2 "If nobody "waters" it providing fresh data, or if the status of the river's health becomes too constantly critical, the plant respectively dies (its sounds and lights fading progressively away) or assume alarming (eg: red) critical sounds and lights (for example, the sounds emitted by the plant progressively become "dirtier" and noisy as the critical condition of the river progresses, up to the point when they become unbearable)" (Iaconesi & Persico, 2020).

3 The project is supported by Direzione Generale Creatività Contemporanea (General Directorate for Contemporary Creativity) of Ministero per i Beni e le Attività Culturali e per il turismo (the italian Ministry of Culture), through its Creative Living Lab II edition programme.

alive place like the memories it preserves and regenerates, which lives of “proximity” and “care” (Manzini, 2021, p. 75) and which establishes strong relationships with the inhabitants who actively participate in its conception, its growth, its development. They become "guardian", like the Custodians of the Oreto River Water *(I Custodi dell'Acqua)*, a group of citizens, students, researchers and activists who, amid a thousand difficulties (in the midst of a pandemic!), organize themselves in an innovative and poetic exploratory adventure to try to "give voice to the river". A new voice that comes thanks to a series of sensors that collect data and information on the health of the river (Figures 4-5).

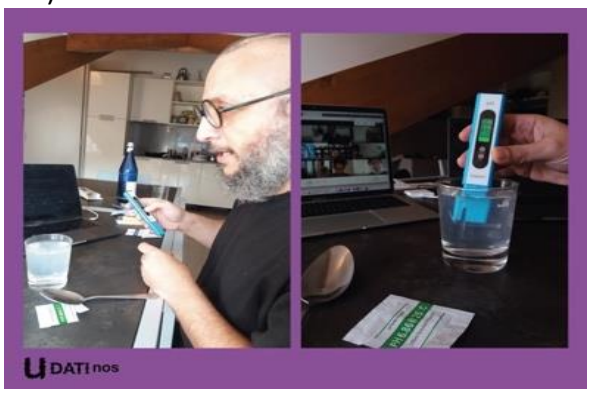

Figure 4. Data collection kit. Iaconesi & Persico. Credits: HER srl

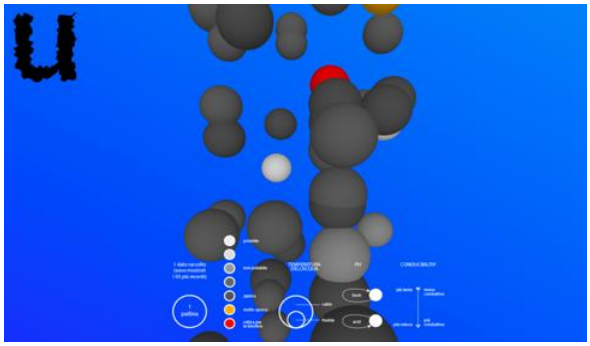

Figure 5. Data visualization. Iaconesi & Persico. Credits: HER srl

These data feed the installation within the Ecomuseum, thus allowing the experience of perception and understanding of a complex phenomenon of our environment: the dynamic state of health of the river and its ecosystem. Through data, computation and algorithms, the social and psychological activation triggered by design and art, the project has managed to bring together Science, Technology and Society (Iaconesi & Persico, 2020), in an absolutely innovative, original and contemporary form. “On the Oreto river, data unite people in acts of self-organization, conviviality, social imagination and adventure” (Iaconesi & Persico, 2021b, self-translation).

But there is more. The philosophy behind the project is extremely interesting; that is, an absolutely innovative approach in data collection/processing/use that transforms and reverses the usual "extractive" practice into a more ethical and human generative practice, based on relationships, reciprocity and collaboration. This reversal is driven by art and design that allow data and computation to transform from dry technical matter to existential matter. As the duo Iaconesi/Persico (2021b) states, art and design "can take data and bring them into the midst of society, removing them from isolation, giving them to people and organizations so that they can be part of their lives".

We are, therefore, faced with a possible, innovative way, in which algorithms, artificial intelligence, big data and Internet of Things (IoT), generate for people not only efficiency, but also sense and poetry. A new season – that Iaconesi imagines as a kind of neo-renaissance of the "made in Italy data-driven" – in which generations of new artifacts will populate our habitats. New semantic, datapoietic, informational and constructional artifacts, capable of activating thought, conveying and producing meanings, or – as Enzo Mari says (2011) – “producing intelligence”.

3. Information graphic (Infoviz), data visualization (Dataviz) and semantic artifacts

"The utopia, which pushed and guided the noble fathers of the web, arises from an inclusive and almost thaumaturgic vision of technology and its use, which is transforming

the use of culture and cities as well as interpersonal relationships, all based on survey, exchange and conditions of data, in which the intangible exchange commodity is knowledge"(Bollini, 2019-2020, p. 51, self-translation).

The *Era of datafication*, formulated in 2013 by Cukier and Mayer-Schönberger, defines a reality in which the dominance of the web and the exponential increase in data has generated the need for new tools for the representation of information, the result of which, over time, it has been infographics, static and dynamic mapping, timelines and the visualization of archives or scientific data. This is possible through the incredible processing power of the visual system, which through the decoding of diagrammatic representations - which collect and describe in detail huge amounts of data produced even on a daily basis - leads to the understanding of complex, emerging and sometimes abstract problems.

The possibility of narrating through the use of information design tools is now a widespread and shared practice among communication designers, a practice that allows complex knowledge to be made accessible to an increasingly large number of people. This objective, linked to the need to make vast deposits of data strictly connected to current searchable and understandable events, refers in part to the technical rigor of mathematical and statistical sciences, in part to the narrative skills of the human and social sciences, proposing the achievement of a compromise between the technical-scientific disciplines and the humanities ones, based on the relationship between the visual representation of information and its secular dissemination (Angari, 2019-2020, p. 217).

Information design[4], defined by Wurman as the discipline capable of creating the meaning of information, communicating and representing it (1990), is the branch of graphic design engaged in searching for the visual balance between textual and iconographic data, in an attempt to communicate with clarity of more or less complex information to those who need to understand and use them (Morelli, 2012).

The design of such artifacts implies for information designers the ability to operate in a directorial manner, facilitating the convergence between the technical-scientific skills necessary for the project, making sure that the rules that allow the message to be conveyed to the context efficiently and adequately are respected and ensuring that the user can independently decode the contents which, according to Stoll (2012), passes through the creation of a metaphor that not only transmits knowledge, but ensures that the reader takes possession of it (Angari, 2019-2020, p. 226).

Starting from these considerations, it is possible, through the analysis of some exemplary design experiences, to investigate the results of proposals which, by crossing technological-scientific languages with visual and narrative experiments, testify to the richness of ideational transpositions emerging from the relationship between a physical context, an increasingly large dimension of intangible data and the dimension of use.

These researches involve a vast heterogeneity of actors (corporate partners, metropolitan governments, individual citizens), within an indispensable inter and transdisciplinary perspective, involving many professionals with a high degree of specialization (computer engineers, designers, urban planners, experts

4 Information visualization (InfoVis) is currently one of the most pursued visualization disciplines as, unlike the others, thanks to a close hybridization with information technology, it allows the analysis and processing of large deposits of data whose visualization is placed in interactive visual interfaces (Manovich, 2011). The term data visualization means any form of visual representation of information that involves the use of graphical representation as a tool to provide visual insights into data, whether static or dynamic (Masud et al., 2010).

in computer science and computer networks and in the development of urban cyber-physical systems based on urban big data).

3.1. Case study| Massachusetts Institute of Technology (MIT)_SENSEable City Lab. *Desirable Streets* (2021)

SENSEable City Lab[5], through an extensive team of professionals, reads urban phenomena, investigating their complexity, and constantly works on the visual rendering and on the graphic elaboration of maps able to represent the dynamism of the phenomena. The challenge that arises is to use communicative artifacts aimed at defining possible directions in design actions, which place the multiple players in an actions' synergy.

The design potential of data determines a peculiar design condition for the information age and it's fundamental in terms of contribution to public utility, as demonstrated by the following case study, which focuses on the use of data and their visual representation for the democratization of complexity. The focus of projects like this is not the mere transmission of information, but the experience that people make of it.

Different declinations of visual mapping, which connect a real physical-geographical context to the multiple available levels of information, can feed citizens participation, awareness, identity processes, in support of individual choices and project actions; on the one hand with the aim of offering the citizen extremely articulated and updated services, on the other with that of activating dynamic and open views oriented to the knowledge of the characterizations and relationships of contexts, crossing descriptive and narrative methods, technical languages, artistic experiments.

Today, the construction of these communicative artefacts passes through the smart technologies[6] that connect a real physical-geographical context to multiple levels of information on paths, flows, recurring and exceptional elements, signs and traces, fueling participation and awareness with respect to the entity and complexity of socio-economic phenomena and thus becoming an effective support for individual choices and project actions (Trapani & Del Puglia, 2020).

These artifacts are able to communicate the dynamism and the relationships between the physical material elements and the immaterial forms that characterize the contexts. Furthermore, the connection and intersection of data on different levels of information offer the possibility of interpreting the phenomenology of the environments to which we are part, identifying points of criticality of the systems and tracing their causes, offering the possibility of imagining and planning actions to improve the contexts themselves. Information design therefore finds itself seeking a balance between new methods of collecting and disseminating data and new actors involved in the analysis and interpretation processes; the open and accessible possibility of visual representation of data becomes the terrain of unprecedented visual syntheses of complexity.

The *Desirable Streets* (2021) project of the SENSEable City Lab, starting from the analysis of thousands of pedestrian trajectories obtained from GPS signals on the streets of Boston, builds an "index of desirability" of citizens. The experience of walking around a

5 Directed by Carlo Ratti, in collaboration with the City Design and Development group - Department of Urban Studies and Planning, and the MIT Media Lab, the SENSEable City Lab was created to study and anticipate how digital technologies are changing the way people live and their implications on an urban scale.

6 Innovative digital technologies, applied to various production and operational processes, enable a strong interconnection between the resources used. They range from the Internet of Things, Big Data and Cloud Computing close to the world of Information Technology, to those closest to the world of Operations such as collaborative robotics, augmented and virtual reality, 3d printing. https://blog.osservatori.net/it_it/smart-technologies-quarta-rivoluzione-industriale.

city, in fact, is influenced by the services and visual qualities of the surrounding built environment rather than by the choice of the shortest route (Miranda et. al., 2021). The index captures the willingness of pedestrians to deviate from their shortest path and provides a measure of the landscape and experiential value provided by different parts of the city and contexts. The use of computer vision techniques combined with georeferenced data to measure the "street environment", provides significant data for identifying those characterizing elements that make some routes desirable rather than others: better access to public services such as parks and green spaces, the presence of easier and more enjoyable sidewalks, the provision of more comfortable and pleasant urban furnishings, the less complex facades of the buildings that surround them and the diversification of the architectures (Figures 6-7).

Figure 6. *Project hypothesis.* Screenshot from the website https://senseable.mit.edu/desirable-streets/ (author's collage)

Figure 7. *Points from the OSM streets network used to query the images from Google Street View.* Screenshot from the website https://senseable.mit.edu/desirable-streets/

These results, by strengthening the understanding of the value that the built environment brings to pedestrians, can have an important impact on the ability to design more functional and enjoyable environments and contexts in the future, fielding a new idea of the city, determined by sensations and desires of citizens.

4. Conclusions

The interdisciplinary nature of the information designer, as well as his ability to discover new relationships between signs, things, actions and thoughts (Buchanan, 1992), and therefore not only the ability to represent quantitative data, but also to visualize complex information through the visual narration of qualitative values and data (Scagnetti et.al., 2007) entails new challenges in the construction of a narrative that facilitates effective and intelligible access to information (Angari, 2019-2020). The centrality of the contribution that the disciplines of design, and of infodesign in particular, can give to the debate on the subject suggests a necessary impact also on the training paths of new designers and specific skills able to pass from the sphere of material production (product) to the sphere of immaterial production, such as interaction, experience and service planning. A transition, from hardware to software, already underway for some years in the culture of design (Meyer

& Norman, 2020), capable of questioning how professional design practices can be reconfigured to accommodate a more complex vision of social change.
This vision combines not only different disciplines and practices, but also society as a whole. Here again lies the potential role for design, which can rediscover its humanistic and social soul and act as an interconnector between multiple types of agents. This is also an evolutionary opportunity for design education practices, in which this modality can be implemented directly into the learning process, by opening it up to the city, the territory and its inhabitants. Which brings on the next relevant pattern: the one of participation, inclusion and social engagement (Iaconesi, 2017).

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The contribution is the result of a common reflection by the authors. Specifically, the paragraphs 1. *Introduction*, 2. From *philosophy as conceptual design* to *semantic* and *datapoietic artifacts,* 2.1 Case study|*U-DATInos* are to be attributed to *F*rancesco Monterosso; the paragraphs 3. *Information graphic (Infoviz), data visualization (Dataviz) and semantic artifacts*, 3.1 Case study|Massachusetts Institute of Technology (MIT)_SENSEable City Lab. *Desirable Streets* (2021)*,* 4. *Conclusions* are to be attributed to Serena Del Puglia.

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Transition Experoments, A boost to 2050

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ABSTRACT

Today's environmental problems make a change in society's mobility behaviour urgently necessary in order to achieve the decarbonisation targets set in the Paris Agreement for 2050. Added to this are concerns about road safety, public health, the economy and social justice and inclusion. The recent pandemic has brought home to most sceptics the environmental impact of the car, the need to redistribute public space in favour of more sustainable modes of transport, and the importance of urban living space in cities, reinforcing the defence of this public concern. In this sense, many cities have demonstrated their resilience and adaptability to new needs by implementing provisional measures to redistribute public space (e.g., creating bike lanes, pedestrian zones or widening pavements and squares) that drive definitive projects for these areas, which in turn represent a paradigm shift that accelerates the changes advocated for 2050. Many of these pop-up measures fit into the Transition Experiments methodology, advocated here as a counter-position (or at least a complement) to traditional planning methods and traditional public engagement through citizen participation. Indeed, we live in a time of transition between unsustainable habits that are strongly rooted in today's society and the emergence of more sustainable lifestyles. In this paper, we address the inevitable paradigm shift to promote sustainable urban mobility, the obstacles that prevent this transition in the short term, and the tools at our disposal to accelerate this change. This approach is tested in a real-world setting, the urban laboratory of the city of Braga, Portugal.

We argue that conducting changeover experiments is a valuable tool to accelerate the shift of attitudes and behaviours towards sustainable urban mobility, as it gives society the opportunity to experience physical changes before the final transformation. The three case studies aim to show that using a multi-level perspective of change through the interaction of transition experiments at macro (national and/or international level), meso (city level) and micro (neighbourhood level) levels contributes to change through processes of co-evolution and mutual adaptation between these levels.

KEYWORDS

Transition Experiments; Sustainable Mobility; Living Labs; Braga

1. Introduction

Urban growth is usually associated with complex mobility and transport problems. These are caused by the massive use of cars, which causes serious difficulties for the population through loss of time, increased fuel consumption, stress, impairment of quality of life and increased risk of accidents (Cavoli, 2021; Gressai et al., 2021), and which even affects men and women differently (Olivieri & Fageda, 2021). In recent years, we have seen a wide variety of policies addressing urban areas and aiming to meet the increased expectations of improving living conditions. The need to prevent car-centric urban development is seen as one of the main drivers for achieving the Sustainable Development Goals and climate agreements (Cavoli, 2021). Recent studies recognise the pandemic as a relevant factor for urban mobility (Moreno et al., 2021; Padmakumar & Patil, 2022), as the pandemic increases the vulnerability and unsustainability of car-dependent cities, leading to reconsideration

of innovative measures to ensure urban liveability (Padmakumar & Patil, 2022). The literature provides examples of specific programmes and measures to implement different strategies. However, it hasn't been fully explored what and how these measures and actions can be used, especially in countries and cities where car use is so high because it's associated with goods, flexibility and the reduction of time lost in shifts.

Our paper contributes to this stream of reflection by analysing the development of three Transition Experiments in Braga, Portugal, mapping residents' mobility practises and reflecting on how to implement measures to promote sustainability. It's proposed that promoting Sustainable Urban Mobility (SUM) involves both reversing the mobility pyramid by giving priority to pedestrian traffic and redistributing public space, which is currently mainly used for private transport. This makes room for other functions that strengthen collective ties and neighbourhood unity and promote the quality of urban life (Berlingieri & Valente, 2021), safety, equity, health and the environment (Corais, 2021). The most important question, however, is how and to what extent the change in mobility patterns requires a change in cultural patterns regarding the valorisation of the car and the value of time spent walking. Transition experiments consist of scattered events in the city that show what can be done and how people can change their habits are of paramount importance. Guided by the collective values of sustainability, transition experiments allow the simulation and evaluation of a specific action before the implementation of the final solution, which is why they need to be developed, in the physical and social sense at three levels (Macro, meso and micro). In this sense, the aim of this article is to describe part of the Transition Experiments carried out in the city of Braga and to reflect on how they can be useful and appropriate for a change towards sustainability.

The paper is divided into four main parts: theoretical framework, methodology and description of TE held in Braga. Finally, conclusions are drawn on the impact of such a process on changing societal attitudes towards sustainable mobility.

2. Theorical framework

The literature emphasises the urgency of governance for the transition to fair and sustainable urban mobility based on local policies that aim to prioritise walking, cycling, sharing and public transport (Loorbach et al., 2021). Studies show that there is a need to consider sustainable mobility solutions, enable more liveable neighbourhoods, promote social interaction, reduce distances and promote traffic-free streets (Avelino & Rotmans, 2009; Bertolini, 2020; Bertolini et al., 2008; De Bruijne et al., 2010; Geels, 2012; Gössling & Cohen, 2014; Kemp et al., 2007, 2011; Liedtke et al., 2015; Loorbach, 2007; Schussel, 2019; Sengers et al., 2019; Van den Bosch & Rotmans, 2008; Vinci & Dio, 2014). Furthermore, the studies focus on the need to raise awareness of the importance of co-creation in order to design cities and streets according to the expectations and perceptions of different stakeholders (Tsavachidis & Petit, 2022), especially families, children, older people and people with special needs. The idea is to build cities where residents can meet their needs in a short walk or by bicycle (Hosford et al., 2022). This requires an urban planning model in which residents can fulfil six urban functions in their neighbourhood: Living, Working, Shopping, Health, Education and Entertainment (Hosford et al., 2022; Moreno et al., 2021). Few studies examine the factors that influence walking and cycling for daily activities (Cervero et al., 2009; Cervero & Kockelman, 1997; Hickman et al., 2010). Other authors have developed research that links mobility options to three variables (3 D's): Density, Diversity and Design. Ewing and Cervero (2010) examined the effects of design (large-scale and small-scale) on travel

behaviour in residential areas. They point to important features to consider, such as orientation, landscaping, and other pedestrian facilities. They also point to a number of negative strategies: parking between buildings and the street, insecurity, excessive surveillance, lack of accessibility for pedestrians and public transport users, and lack of spaces for human interaction. Later, Cervero et al. (2009) and Ewing and Cervero (2010) emphasise accessibility at the destination and distance to public transport. In terms of design, the same authors point out that walking accessibility depends on variables such as road configuration (straight, curved, dense, sparse), pavement surface or protection, average road width, number of pedestrian crossings, density of existing intersections in the road network (connectivity), presence of trees or other physical elements.

Other studies (Saelens et al., 2003; Zuniga-Teran et al., 2016, 2019) emphasise the importance of analysing the influence of urban design on walkability, physical activity and the experience of public space. More recently, authors emphasise the interest in developing pedestrian friendliness (Lyu & Forsyth, 2021; Tsavachidis & Petit, 2022), subscribe to the proposed theses and stress the need to consider the following aspects: (i) mobility solutions that are geared to people's needs; (ii) promotion of alternative modes of transport, especially active mobility; (iii) targeted communication with citizens and local businesses through timely and personalised content; (iv) working with digital platforms dedicated to the personalised development of solutions that are geared to the needs of citizens and stakeholders; v) shortening the distances to be travelled planning strategies aimed at reducing speed and conditioning traffic multimodal offers of active, clean and shared modes of transport; vi) planning focused on innovative mobility solutions that promote, among other things, active forms of mobility and green spaces".

The concept of Transition Experiments emerged at the end of the 20th century and has gained particular importance in the Netherlands (it was incorporated into Dutch legislation in 2001). In the context of Transition Paradigm, this concept plays an important role in preparing and strengthening society for change (TE) (Avelino, 2009, 2011; De Bruijne et al., 2010; Loorbach et al., 2021; Roorda et al., 2014; Sengers et al., 2019; STRN, 2010; Van den Bosch, 2010; Van den Bosch & Rotmans, 2008). The main objective of Transition Experiments is to drive fundamental change in a prevailing structure and bring about change at the cultural level (creating awareness of change and taking up a new sustainability discourse), at the level of practical action (new ways of acting and new routines) and at the level of structural organisation (integrating changes in financial, political and legal priorities in favour of sustainability). The Transition Experiments are both a concept and a method and follow a participatory premise by bringing together different societal actors, the so-called "Transition Agents", to discuss concrete problems in a Transition Arena where actors engage in capacity building and empowerment. This promotes the consolidation of reflective governance. This consists of continuously monitoring and evaluating political and social learning and the adoption of sustainability practices (Frantzeskaki et al., 2014). In this way, the transition process is designed to be gradual and in successive cycles through experimentation (Corais et al., 2022; Van den Bosch & Rotmans, 2008):

1º Deepening (social learning process that emerges through experience and interaction in a specific context and includes cultural, practical and structural changes);

2º Broadening (learning from similar experiences applied in new contexts and/or domains);

3º Scaling up (learning by extending the problem from the local to the global level,

incorporating new methods of practical action and a new culture).
According to Van den Bosch and Rotmans (2008), in the deepening phase, actors can learn about the relationships between new practises and how they can influence the culture and structure for a sustainable orientation by changing their attitude (Corais et al., 2022; Loorbach et al., 2015). Some authors, such as Roorda et al. (2014), suggest establishing a transition arena during a TE that should be staffed by neutral change agents who guarantee liberation from specific interests and combine a core set of competences relevant to awareness raising. As explained earlier (Corais et al., 2022), the multi-level perspective ((Rip, Arie ; Kempt, 1998) involves the interaction of three levels of action: Macro, Meso and Micro (**Errore. L'origine riferimento non è stata trovata.**). Furthermore, change occurs through processes of co-evolution and mutual adaptation between these levels (Shove & Walker, 2007).

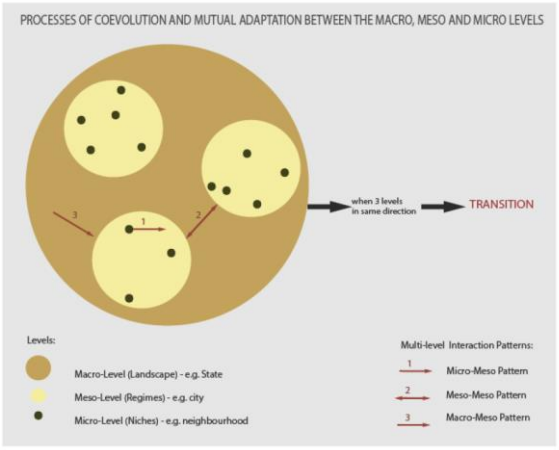

Figure 1. Multi-level perspective. In, (Corais et al., 2022, p. 95)

Table 1, Table 2).

TE are tested in Real Life Labs, which behave as incubators of sustainable urban innovation, in a given territorial and social context and aim to achieve a structural social transformation challenge through research, action and innovation processes (Nevens et al., 2013).
This experimental learning, through temporary activities whose results are unknown at the outset, enhances a new social practice through the "learning by doing" methodology (Sengers et al., 2019).

2. Methodology

This paper is produced as part of the development of the PhD thesis "The city on the way to 2050. Braga as a laboratory for a sustainable and resilient urban system" (Corais, 2021). This work is based on the information we gathered in the three experiments in the city of Braga, mainly through the use of techniques integrating the action research methodology already described: i) a survey of school bus users; ii) focus groups with experts and neutral stakeholders; iii) and on-site observation complemented by the preparation and installation of parklets. A more detailed explanation of the individual steps can be found in the appendix Our proposal is to follow the description of the Experiments and give evidence of their main effects, and impacts (

Table 1. Action techniques applied to the case studies. Own source.

What?	When?	How?	Who?	Where?	What for?
Transition Arena	4 sessions with experts on (February and March 2022) ● Session local agents (May 2022) ● 2 sessions with members of the executive (July and September 2022) ● Transition agenda presentation (september 2022) ● 4 Sessions with county technicians (January 2023).	The meetings were structured in three parts: 1. brief thematic framework and synthesis of the previous meeting 2. collection of contributions from the transition agents, using the Miro - Visual Collaboration Software tool or panels (in the face-to-face sessions).	Experts, population, municipal technicians and local politicians	City of Braga, Portugal	● Establish prior frame of reference; SWOT analysis; Stakeholder analysis; identification of mobility problems and challenges; Benchmarking ● Evaluate changes in attitudes ● contribute to reflection, capacity building and mutual learning (researchers, local administration and society) ● Define consensus on the Future Vision for 2050 and transition paths to 2040, 2030 and actuality.
SchoolBus	● 2 weeks in September 2017; ● School years from 2018 to the present.	● 4 interfaces at the “city gates” with dedicated transportation to 8 schools in the city center	School community of the 8 schools	Braga City Center	● Empower and raise awareness of the School Community for the promotion of MUS; ● Change mindsets, attitudes, and behaviors; ● Decarbonize.
Parklet	● 29.05.2022 to 05.06.2022 (parklet reused materials) ● 2022.06.13 (flower planting) ● 16.09.2022 to present (wooden parklet) ● 03.10.2022 (flower planting)	- On 29.05.2022 a parklet was implemented in two parking spaces near the south entrance of the school, using reused materials from the municipal yard (e.g. vases, recycled sidewalk from playgrounds).	School community (Calouste Gulbenkian School)	Public space near one of the entrances to the Calouste Gulbenkian Conservatory School, in Braga	● Empower and raise awareness of the School Community for the promotion of MUS; ● Change mindsets, attitudes, and behaviors; ● Increase safety at the school's door; ● Increase public space allocated to pedestrians; ● Increase urban livability;

		- A new parklet, made of wood, was implemented at the same location on 16.09.2022.			● Decarbonize.

Table 2 – Research techniques applied to the case studies. Own source.

What?	When?	How?	Who?	Where?	What for?
Observation	● Transition Arena - in sessions (2022/2023) ● SchoolBus - school year 2018/2019 ● Parklet - December 2021 and March, September, and October 2022	● Transition Arena - observation and recording of the interventions of the transition agents and their attitudes; photographic record; ● SchoolBus - observation of the behavior of children and parents from the interface to arrival at schools; photographic record and data collected; ● Parklet - observation of behavior and occupation of space; photographic record; Record of data collected in Excel tables; Preparation of drawings: counting vehicles and people;	● Transition Arena - transition officers involved ● SchoolBus and Parklet - school community	● Transition Arena - session location ● SchoolBus - route, stops and schools ● Parklet - December 2021 and March, September and October 2022	● Establish the previous frame of reference and assess whether there are changes at the level of Mobility mindsets, attitudes and behaviors.
Surveys	● Transition Arena - between January and March (residents, merchants and cityusers);in May 2022 politicians and Braga municipality leaders; and in January 2023 sessions to	● Transition Arena - online and in-person surveys were distributed. ● SchoolBus - surveys were distributed to the School Community via email to parents of students enrolled in the pilot project. ● Parklet - online and in-person surveys (distributed directly and through the block cafes) were distributed to residents, merchants,	● Transition Arena - transition officers involved ● SchoolBus - School community ● Parklet - School community, residents, merchants, city -users	● Transition Arena - session location and online ● SchoolBus - schools ● Parklet - block and online	● Establish the previous framework; evaluate the change in attitude and Mobility behaviors and monitor the SchoolBus service and the parklet with a view to implementing improvements.

	municipality technicians; ● SchoolBus - October 2017 ● Parklet - January to March 2022	School Community, and city-users.			
Focus Group	● Transition Arena - January 30, 2023 ● SchoolBus - 2018/2019 school years ● Parklet - May, June, and September 2022	● Transition Arena - Conduct focus group to analyze the data obtained in the transition arenas. ScholBus and Parklet - Focus groups were held in the schools involved in the Pilot Projects. The sessions involved about 25 students who were distributed in 4 or 5 groups. Challenges and questions of MUS were launched in a pedagogical way.	● Transition Arena - Transition Agents ● ScholBus and Parklet -School community	● Transition Arena - Braga City Hall ● ScholBus and Parklet - Schools	● Transition Arena - Consolidate the consensus reached in the Transition Arenas; define short-term transition paths. ● ScholBus and Parklet - Establish the previous reference framework; evaluate the change of attitude and Mobility behaviors and monitor the SchoolBus service and the parklet in order to implement improvements.

3. Transition Experiments

3.1. Case Study 1 - Macro Scale - Transition Arena

One of the TEs consisted of the organization of four focus groups targeted with the construction of the Transition Arena (**Errore. L'origine riferimento non è stata trovata.**). The first focus group was organised in March 2022 following the methodology presented by Roorda et al. (2014) to promote reflection and contribute to the learning process inherent in Transition Experiments. Pioneers of change and experts on mobility and civic participation were invited to participate in a weekly online focus group to develop a SWOT analysis of mobility in Braga and a shared vision for 2050, 2040 and 2030. This TE helped to raise social awareness of the importance of participation in changing mobility practises. This also had an impact on the participation of technicians and other professionals from the Braga Municipality, who were invited to prepare a SWOT and a PESTAL analysis. In other words, a complete diagnosis of the area was made, as well as a timetable for the phases of development and implementation of a future project for this area, involving participatory governance, and a cost estimate for this purpose. Similarly, within the framework of the international network of cities BEACON (Bridging European and Local Climate Action),

a partnership was established between Braga and Bielefeld, sharing best mobility practises between the two cities and holding a workshop for technicians from the city of Braga on the need for mobility change.This partnership, after several meetings between 2020 and 2021, resulted in a methodological guide with good practises of participatory governance to promote the transition to sustainable urban mobility and increase the efficiency of public participation in mobility planning processes.

Figure 3 – Photo of the Transition Arena with the municipal politicians. June 2022. Own source.

3.2. Case Study 2 - Meso Scale - SchoolBus Project

The SchoolBus was a project promoted by the Braga City Council in 2017 during the European Mobility Week, which aimed to test an experiment in decarbonising the city centre (where the main schools of the city are located) by promoting free student transport for the students of 6 schools (3 public and 3 private) in the city centre from interfaces at the main gates of the city (**Errore. L'origine riferimento non è stata trovata.**, **Errore. L'origine riferimento non è stata trovata.**). It consisted of making available a bus to carry children from home to school from several places of the city.

Figure 4. SchoolBus project, September 2017. Own source.

Figure 5. SchoolBus project, September 2017. Own source.

In order to increase the acceptance of the project among the pupils, it was important to promote it directly in the schools to the parents (**Errore. L'origine riferimento non è stata trovata.**) and the children (**Errore. L'origine riferimento non è stata trovata.**) and to appoint "ambassadors" of the project

to promote it and, together with the presence and monitoring by the community police, to give a sense of security, which is essential for parental approval.

Figure 6. Presentation of the SchoolBus Project to the guardians. September, 2017. Own Source.

Figure 7. Presentation of the SchoolBus Project to students. September, 2017. Own Source.

It was also necessary for the community technicians to be personally involved in the project by accompanying the children on the bus to the schools and promoting the project to the parent groups they knew. This trust factor was crucial in reassuring parents that the transport was safe. The survey made to parents was a fundamental tool for the development of the schoolBus project in the following school year. Parents were very open to the continuation of the project and informed the community about adjustments that should be made. 80% of parents said that they no longer had to drive through the city centre to get to their jobs, and the surveys confirmed that the municipality was indeed relieving pressure on the city centre with this mode of transport. The project also led to a reorientation of public transport, because for reasons of equality, all students up to the age of 18 are now offered a free monthly pass, so they can now travel home on normal public transport.

3.3. Case Study 3 - Micro Scale - Implementation of a Parklet

Particularly noteworthy is the implementation of a parklet in a car park near the entrance of one school. The first transitional experiment with a parklet was carried out as part of the first workshop in the study area of the doctoral thesis on 21 May 2022 in order to gather input for the creation of the diagnosis of this area with the participation of local residents and the school community (**Errore. L'origine riferimento non è stata trovata.**, **Errore. L'origine riferimento non è stata trovata.**). This involved temporarily covering a car park on a Saturday morning with a green carpet, a table to gather participants around a model of the block, and props with boards to record the contributions of each participant.

Figure 8. Parklet, May 2022. Own source.

Figure 9. Parklet, May 2022. Own source.

In June 2022, a new parklet was built in a car park next to an entrance to Calouste Gulbenkian School, transforming it into an urban living space for children and parents (**Errore. L'origine riferimento non è stata trovata.**, **Errore. L'origine riferimento non è stata trovata.**). This idea came about through the children's participation in focus groups held during the 2022 Urban Children's Week. The space was idealised by the school community responsible for its maintenance, using materials that were unused and reused (e.g., vases, chairs, flooring), as well as the placement of vegetation to delineate and frame the space. Although only one parking space was originally planned, during implementation the city police advised that two parking spaces should be allocated for legal and safety reasons, close to the existing zebra crossing in front of the entrance to the school. The implementation of the parklet was followed by a period of observation and monitoring, which lasted from June to September 2022, aimed at adapting the final project of this space.

Figure 10. Parklet, June 2022. Own source.

Figure 11. Parklet, June 2022. Own source

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It turned out that the school community used this area, which was added to the existing walkway near the school entrance, to bundle students walking from this point to the municipal swimming pools where swimming lessons are held. Although the square was built with the participation of the school community (**Errore. L'origine riferimento non è stata trovata.**, **Errore. L'origine riferimento non è stata trovata.**) and the students were very involved in maintaining the square, especially watering the plants, the school holidays and the intense heat the following summer caused the plants to dry out, which was a sign that the project wasn't going to continue (**Errore. L'origine riferimento non è stata trovata.**). This situation has led to the realization of a new parklet (**Errore. L'origine riferimento non è stata trovata.**, **Errore. L'origine riferimento non è stata trovata.**), in this location, but with more perennial

materials and more appealing finishes, in the hope that it will motivate the school community to maintain the space with the dignity it deserves.

Figure 12. Parklet, August 2022. Own Source.

Figure 13. Parklet location. August, 2022. Own elaboration.

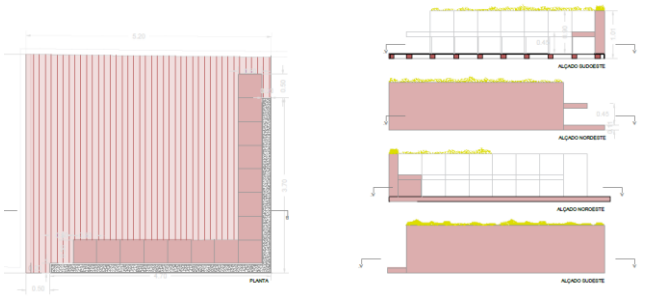

Figure 14 . Parklet project in wood, August, 2022. Elaborated by the authors.

As a result of monitoring and evaluating the initial experience of implementing the parklet, initiatives are planned to complement the implementation of the parklet so that both the school community and the community of residents develop a sense of belonging and a new attitude towards the defence of this space and sustainable mobility. For example, a complementary cultural programme will be defined (e.g. "story time" on Saturday mornings, creation of posters encouraging school children to empty their water bottles at the end of the day in the flower beds created there, exhibition of ATL works, among others) Initiatives will also follow to monitor and evaluate the impact of this parklet on changing attitudes and behaviours in the community through observation, interviews and questionnaire surveys.

4. Discussion and conclusion: The Transition Experiments as a boost for 2050

The three experiences presented in this article show the importance of working on sustainability transformation at these three levels (macro, meso and micro), so that through the interplay of the different levels, change towards a more sustainable system takes place throughout society (Table 3). The transition experiments studied here, although they seem to be independent actions, are linked by an implicit strategy to promote sustainable urban mobility in the municipality of Braga:

In the first TE - transition arena – provided results conveyed by with neutral actors and they were fundamental for contextualising and orienting the next phase, in which other local actors (local power holders and local agents of change, as well as all actors interested in the target area) can be heared.It allowed experts and neutral gents to provide solutions "outside the box" without social or emotional constraints, providing context for a real participative trajectory.

The second TE presented consisted in the School Bus project that resulted in 400 students using the bus as a means of transport between school and home. Doing so, this TE has tge ability to empower children and lead them to use this mode of transport for other trips as well, imprinting the need to change mobility patterns.

The TE refers to a parklet and it shows that the gradual conquest of public space by cars in favour of pedestrians is a strategy of adapting society to the new paradigm of promoting sustainable mobility. If we make the parallelism with other measures implemented in the city from the beginning as definitive and compare the reactions of the respective communities, we can conclude that the gradual change through preliminary experiences has a more positive impact on changing attitudes towards the promotion of soft mobility.

Table 3. Comparative Analysis of the Case Studies. Own elaboration based on (Grin, John; Rotmans, Jan; Schot, 2010; Van den Bosch, 2010; Van den Bosch & Rotmans, 2008).

	Case Study I - Transition Arena	Case Study II - SchoolBus	Case Study III - Parklet
Scale of approach	Macro (National and International)	Meso (City)	Micro (Neighborhood)
Mutual Learning	Neutral change agents and researchers. Compilation of findings for dissemination by the administration and the community. Possibility to schedule future interactions between neutral change agents, researchers, local administration and local community.	Local administration, municipal technicians, researchers, school community.	Local administration, municipal technicians, researchers, school community, residential community. Possibility of replicating the model with other schools in the city or in other cities.
Practical Experience	Constitution of the Transition Arena with neutral change agents that allowed guiding the methodology to be adopted in the next phases of extending the Transition Arena to the local community and local government.	Test implemented in September 2017 for 2 weeks and 6 pilot schools.	Test implemented in June 2022, during the celebrations of the Municipal Children's Week, with the execution of a temporary parklet.
Main changes	Changes at the level of structure (institutional), at the cultural level (new values and thinking), and at the level of practices (encouraging a new attitude and new, more sustainable behaviors).	Changes at the level of structure (physical, institutional and economic), at the cultural level (new values and thoughts of the school community) and at the level of practices (new routines and encouraging a new attitude and new, more sustainable behaviors).	Changes at the level of structure (physical, institutional and economic), at the cultural level (new values and thoughts of the school and residential and institutional community) and at the level of practices (new routines and encouraging a new attitude and new more sustainable behaviors).

Deepening	Deepening of the problems rooted in society that condition the acceleration of the change towards sustainable mobility. Definition of strategic objectives, Vision for the future 2050 and transition paths for 2040, 2030 and 2022. Definition of the main stakeholders to be involved in the change and their role in terms of impact for change and interest.	Involving the school community in the issue of school mobility, through questionnaire surveys, interviews, focus groups and awareness-raising activities.	Involvement of the school community and resident community in the issue of school mobility, through questionnaire surveys, interviews, focus groups and awareness-raising actions. Observation of the Transition Experiment and on-site reactions to the occupation of public space.
Broadening	Extending the Transition Arenas to local government officials and change agents in the local community.	Extending the project to the entire municipality.	Extension of the Experiment to one more parking space transformed into pedestrian space and transformation of temporary occupancy into more perennial materials. Application of TE near the entrances of other schools in the city.
Scaling up	Dissemination of the results of the Transition Arena and application to other national and international territories.	Dissemination of the SchoolBus project in the various networks of partner cities in Braga and application to other national and international territories.	Dissemination of the Transition Experiment of the parklet, in academia and in the networks of partner cities of the city of Braga and application to other national and international territories.

Conclusion

It's remarkable how much emphasis is placed in the case studies on experimenting and testing solutions before final implementation to ensure continuous improvement, perfecting solutions and acclimatising society to the transition to sustainability. Another important conclusion is the importance of interaction and mutual learning between researchers, administration, companies and society. In short, Transition Experiments initiate societal change through research, learning and experimentation to solve persistent problems and needs that are no longer sustainable. The cultural shift towards sustainable mobility is only effective if it reaches the three territorial and social levels (macro, meso and micro) and involves society and administrations in a change of thinking, practises and institutional organisation (Corais, 2021).

TE is an innovative intervention because it breaks with the traditional models of relations between institutions, community and local administration, as well as with practises for

implementing solutions, which in this case encourage experimentation, testing, reflection, capacity building and monitoring before the final implementation of measures. The TE also present the desired future as a starting point and the transition pathways are outlined in this perspective of the future vision. In this way, TE leads to changes in the structure of institutions, cultural patterns and social practises. By combining the multi-level perspective with the mechanisms of deepening, widening and scaling, the desired transition to a new (more sustainable and dominant) balance in social dynamics is achieved at the level of thinking, practises and structures.

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Dialogue between the building and the street. The transition space: from formality to informality

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ABSTRACT

While we face global warming and the finite availability of resources on the planet it has become imminent the need to put sustainability at the center of the intervention. In Europe, movements such as the "New European Bauhaus" are inviting public and private entities, architects, designers, artists to intervene in the present, and future of the cities, raising the question of how we can design on the existing at the same time respecting the values of aesthetics and urban experience. The importance of quality of life in the construction of our cities emerges becoming one of the main topics.

So, it is necessary to resume the dialogue between the building, and the city. How can we design through the relationship between the building and the street? What qualities does the building confer to the urban experience?

Through these questions, there is an element of architecture that stands out – **the façade** – fundamental to qualify the adjacent spaces and capable of creating its own habitable space. It is necessary to look at these transitional spaces created through the façade, not as a boundary but as a transition.

Understand that in this space we have 3 scales:

- the scale of the **Bodies** through people, the way they appropriate and the voyaging experience;
- the scale of the **Buildings**, aspiring to constructions that are more committed to the place and that seek to relate to their surroundings;
- the scale of **Boundaries** and Territory, which explores the strategy that aims to enhance the lived and resilient city.

In this sense, the focus is the space in-between as a catalyst of dynamics and a qualitative element in the user's urban experience. The spaces in-between are those between the public and the private domain, the interior and the exterior, the sun and the shade, or between heat and cold. These spaces are the interface, they can be boundaries, they have thickness, they have depth, and they create transitional spaces, making them flexible and conducive to the adaptability necessary for the resilience of the city. They are also spaces of memory bringing the city closer to the scale of the neighbourhood.

It leads to a three-dimensional approach to the city, in the encounter between the street (plan) and the building (section and elevation), reinforcing the relevance of resuming the dialogue between the building and the street, not allowing buildings to ignore the city in their design.

We seek to build a mode of urban reading that understands how formal factors such as the design of transitional spaces, architectural elements (doors, windows, balconies), the typology of the façade, the scale and the program encourage or inhibit informal modes of appropriation, consequently how appropriations qualify the public space.

Examples will be presented of recent or ongoing urban regeneration plans, and architectural projects where the façade qualifies both the exterior and interior space such as the work of Lacaton & Vassal (Pritzker 2021).

"By prioritising the enrichment of quality of life through freedom of use, they are able to benefit the individual socially, ecologically and economically, helping the evolution of the city." (Pritzker Prize jury about Lacaton & Vassal, 2021)

Simultaneously introduce the two case studies developed in the first approach to the research, which are chosen according to the sharing of certain characteristics, namely, for crossing part of an urban fabric consolidated over several centuries, and presenting a great type-morphological diversity, Braga (Portugal) and Ghent (Belgium), that will allow the analysis of a complex structure similar to other European medium-sized cities.

The main goal is to reinforce the importance of an analysis of the appropriations existing in the transitional space created by façades as part of the elements that qualify the urban space. It is also important to know how the quality of the public space is associated with the collective and the private space adjacent to it and how architects, designers, and artists, can be part of this process.
Transitions are, in fact, inevitable, they are happening daily through the user in relation with construction and urban objects, so we have to be able to analyse them and project with/about the transitions.

KEYWORDS
Façade; Collective Spaces; Transitions; Depth Configuration; Appropriation

By opening a door, we invite the outside into the house and open the inside to the outside world. An example of how the appropriation of constructive parts represents a change of the architectural space is the ability of a simple action like opening a door to create such profound modifications. The ability to create new dynamics at all scales, from the scale of the building to the scale of the city, depends on the understanding of the architectural project as something that the user can appropriate and modify during time.
In a three-dimensional view of a city, the main goal is to investigate the façade component as a transitional space (between interior-exterior) that embraces collective uses. As a result, it enhances various qualities in both the street and the internal space, diversifying usage.

Figure 1. The Bedroom. 1659. Painted by Pieter de Hooch

1. A vibrant and lived city is a sustainable city

Sustainability and well-being are the basis of an urban intervention, and the justification for the return of dialogue between Architecture and Urbanism. It is necessary to intervene at the public and private level, from master plans to small-scale projects, in order to create a more resilient city.
Projects in architecture or urbanism involve combining several guiding principles, points of reference, and sources of inspiration in an effort to rethink and create an ideal or a solution by reading what is already there. In order to improve resilience and quality, public and private organizations, architects,

designers, and artists are being urged to reimagine cities. Movements such as the "New Bauhaus" aim to redefine how to design and intervene in various contexts through critical and transdisciplinary thinking that blends science and research, technology, and construction. It aims for an innovative Europe with common values and a distinctive identity where the importance of life quality is prioritized and the aesthetic principles inherent in all forms of art are recognized.[1]

Other concepts are emerging, which point to new concerns and approaches, both in research and in design, which are in line with the creation of a sustainable city on an urban scale. Urban regeneration, smart cities, the 15-minute city, rehabilitation, reuse, and the urban experience are only a few examples of concepts that show a shift toward the lived city that values the user as much as the infrastructure.

The urban experience, which highlights the value of comprehending the place beyond what the architect intended to design, and appreciating the perceptions of the individual, is the concept that has gained new prominence among these ideas. The description of the city is based on how each individual experiences the surroundings, as mentioned in the statement that experience is often associated with the many atmospheres created along the street through the layout and formal configuration. Individual's experience in the city contributes to reinforce the awareness of the urban setting.[2]

Sustainable concerns are evident at the scale of architectural building in addition to being present at the territorial and urban scales, allowing to consider that the user's experience is related to both public and private spaces and to its transition.

The "Pritzker Prize 2021" awarded to the architects Lacaton & Vassal incorporates concepts such as reuse into the design, taking into account individual perspective and daily use, and is in line with the idea of a lived-in city that also functions as a sustainable city.

Figure 2. Façade as an usable area. Bordeaux 2018. Philippe Ruault.

The jury's statement about the 2021 winners appears in the Pritzker Awards news release "In their housing projects for the transformation of the Paris block, Tour Bois le Prêtre, and three blocks in the Grand Parc neighborhood in Bordeaux (both realized with Frédéric Druot), instead of demolition and reconstruction they carefully added space to the existing buildings in the form of generous extensions, winter gardens and balconies that allow for freedom of use and therefore are supportive of the real lives of the residents" (Pritzker, 2021).[3] As freedom of use is reiterated in Lacaton & Vassal's architecture as a qualitative informal aspect in architectural design, it is important to comprehend the role that this approach, together with urban experience, plays in the development of the city.

A user-oriented approach also allows to reflect on the multiplicity existing in society and how cultural and social diversity influences the configuration of spaces, making impossible to detach the impact of the context in the uses.

2. Façade as inhabited space

As indoor space is characterized by the free appropriation of the user and public space by the norms established by society, it is fundamental to recognize the transitional space between domains, public and private,

and indoors-outdoors, not only as boundaries but also as expansions, inhabitable spaces of coexistence. The transitional spaces that the façade creates are permanence places with unique qualities that relate to adjacent spaces, and to the human scale. According to psychoanalyst D.W. Winnicott's (2018) definition of transitional spaces, "transitional space (intermediate area, third area) is that space of experiencing, between the inner and outer worlds, and contributed to by both". With Winnicott, we can consider that the transitional space is also formally a psychological space, thus recognizing that these physical spaces create a specific atmosphere to project.[4] Thus, in cities the space in-between produced by the façade exposes itself to be habitable, but are architects responsible for considering this potentiality? Or is this city's configuration considered in urban planning?

Figure 3. Third space. Pontevedra 2021. Diana Gouveia Amaral

The façade is an element of architecture with depth and thickness, so the depth of the façade as an inhabitable space is present in traditional architecture as a filter between the private and the public, in the entrance to dwellings, or between the sacred and the profane, in the case of churches and other religious structures. In Japanese culture, there is a transitional area between the interior private space and the outdoor garden space. This space is called 'Engawa' and it is connected with the depth of the façade as a covered and paved zone that extends from the sliding-door façade. It is an area that allows for a gradual transition between the interior and exterior while accommodating a variety of inhabitant activities. Although it has no fixed program, it has a variety of uses and plays an essential social role as a place where guests are hosted and where individuals can interact with nature, valued in local culture. This notion is crucial to traditional Japanese architecture, allowing us to evaluate the potential of a transitional space to characterize the dwelling and the fact that components such as the door, floor, and roof of these spaces influence the plurality of uses.[5] Then we can comprehend how this part, which is frequently considered the street's barrier, is, in fact, an element that integrates it, gives it a cadence of spaces, and qualifies it. [6]

The concept of façade that does not refer entirely to the vertical line is essential to comprehending these inhabited spaces as a complex whole — for example, the transition in a dwelling, for instance, does not begin at the door but rather at the entrance landing and extends into the interior. Simultaneously, it is necessary to relate this new approach to living spaces not only with public spaces, but also with collective spaces, public or private, and with the articulation between both, as illustrated by 'Engawa'.

Looking at the city through its intermediate spaces, associated with the façade, and the ways in which these spaces are defined and created enables us to place ourselves between two project scales, the built scale and the urban scale, consequently promoting

architecture projects committed to the city and the public space as well as recalling architecture and urbanism as inextricably linked disciplines.
This approach, reveals the space as atmospheres that change depending on the person, and her experience, we talk about the Body Scale to construct our perception of a place.

3. Bodies Scale, users' appropriation and the voyaging experience — Design by observing
It is essential to perceive the project as a process consisting of several parts, beginning with the observation of the existent on the site and continuing through synthesis, (re)thinking, and development to the constructed object, which is not the end result. The ultimate result therefore depends on a new stage: the user's appropriations; that is, the output of design is not only the architect's project, but also the users' interaction with the project. The perception of the user as capable of actively engaging in the city is a concept familiar to all linked with ground floor applications and the meeting of the door with the street, such as cafes, stores, and dwellings that extend the interior to the exterior. Thus, it is essential that the design acknowledges that the project does not cease when the work is accomplished, but rather is something that transforms and recreates itself through use.
The social and cultural context in which the project takes place should be considered crucial in determining how it shapes the private and public space experience. Thus, let's consider the example of the Portuguese island of Bela Vista in Porto. An island is a housing form that has been in the city of Porto since the 18th century and was later bolstered by the Industrial Revolution and the rural-to-urban migration, becoming a workers' community.
Due to a difficult socioeconomic context, the islands were neglected by municipalities for many years, and their internal streets were not classified public space, allowing for a significant appropriation of the outer collective space by inhabitants. As these neighborhoods are an important part of the urban fabric of Porto, the City Hall developed a competition to rehabilitate the housing units and improve the public and collective outdoor space. The winner was Cerejeira Fontes Architects' project that consists of observing the users' appropriations in order to formalize an architectural proposal. Through the reinterpretation of the existing elements, such as the shading canopies, the tanks, and the clotheslines, the architectural project incorporates informal uses into its conception, becoming an example of how the public space can incorporate private uses in the interface. [7]

Figure 4. Before and After Bela Vista Island. Porto 2018. Cerejeira Fontes Architects

In this case, the building form is a tool for the architects to shape the way of inhabiting. Design is seen as the integration of the architectural project with the appropriations of the individual in order to have interventions which are more receptive to the context.
Exceptional circumstances, however, such as the pandemic we had in 2020/21, identify balconies and windows as communal and social spaces, despite the fact that these areas are private and located at a different level than the street. This approach leads to a three-dimensional strategy to the cityscape, in which the interaction between the street (plan) and the building (section and elevation) demonstrates that the city is perceived not only on the ground floor but also on several levels.
Medium-sized European cities, represent over than 80% of the urban environment in Europe,

that include in their morphology ambiguous spaces created by the façade that support multiple building-street transitions, which allow us to quantify their impact on the city level of this users' experiences, we could name it the Body Scale.

In Pontevedra, Spain, for instance, the municipality has established new dimensions of collective space by minimizing the car's presence in the city through a new mobility strategy.[8] In the ongoing research, we have analyzed how such transformation in accessibility has enabled for its informal appropriation by the user, the neighborhood, or the establishments, and we have observed that formal elements including stairs or arcades have functioned as a canvas for the free appropriations that have become features that make the city a pioneer and a successful case study. The combination of these appropriations and mobility improves the quality of life in the city and increases its future resilience. This condition is not only observed in Pontevedra; comparable-sized cities and future case studies such as Braga (Portugal) or Ghent (Belgium), also enable a causative link between the freedom of appropriation and the thickness of the façade and more inhabited streets.[9]

Figure 5. Appropriation of the stairs to play. Pontevedra 2021. Diana Gouveia Amaral

Through this case studies, we explore how and when to encourage the patterns of appropriation that result from an architectural project. Thus, it is required to undertake the research through components of the design process, such as the observation of the existing site conditions and their synthesis. We begin by analyzing formal aspects, such as architectural components (doors, windows, and balconies), which enables us to anticipate the combinations that generate the most urban vitality. Then, we portray the informal features of the urban landscape, such as occupations and people's movements. Due to the fact that both formal and informal aspects are apparent in the urban landscape, we aim to apply an urban reading methodology based on users and on informal components that are not usually represented on formal graphic elements in architecture and urbanism, as maps or sections.

4. Formal elements to promote or inhibit usage

There are multiple factors for the origin of the appropriations and they are related to the Street/Building Scale. Considering the European medium-sized cities as research studies highlights the necessity of comprehending the place's pre-existing conditions to approach the territory. Consequently, six preliminary criteria concerning formal elements are stipulated.[10]

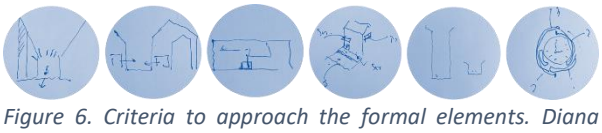


Figure 6. Criteria to approach the formal elements. Diana Gouveia Amaral

- The street's boundaries, such as walls, vegetation, and permeable space, affect how people walk in the city. This is illustrated by Gianbattista Nolli's 1748 map of Rome, in

which the city is represented by the limitations of what we walk along as opposed to the limits of public area;
- Since each building's functionality is directly related to street stopping places, other criteria include the program and/or the ground level;
- Also, the typology of the façade is a parameter by which the formal aspects of architecture, such as the design characteristics (for example balconies and doors), and the materiality, are related to the appropriations. At this point, it only seeks to comprehend the architectural project as well as the aesthetics and utility that are responsible for altering a site's dynamics;[11]
- Transition is related with intervals, which qualify the relationship between public and private spaces through depth, and thickness, which implies a moment of adaptation to what is on the other side and is associated with the notion of atmospheres; [12]
- The relationship between the scale of the structure and the human scale is a formal element to be analyzed since it is related to our perception and experience and is capable of inducing feelings of comfort or distress;
- The final aspect is time, which influences the urban experience either through the deterioration of a building or during the day. Frequently related with the program, time alters the structure of the street boundaries, for instance when businesses are open or closed.

These criteria are not immutable; they are interrelated, allowing us to build the axes of study for an urban reading from the small scale to the street scale and the neighborhood scale. It enables us to comprehend the role formal components have on promoting or limiting appropriations, together with the informal behaviors that result from formal elements. It is with these criteria that we are able to analyze the building's role in the city.

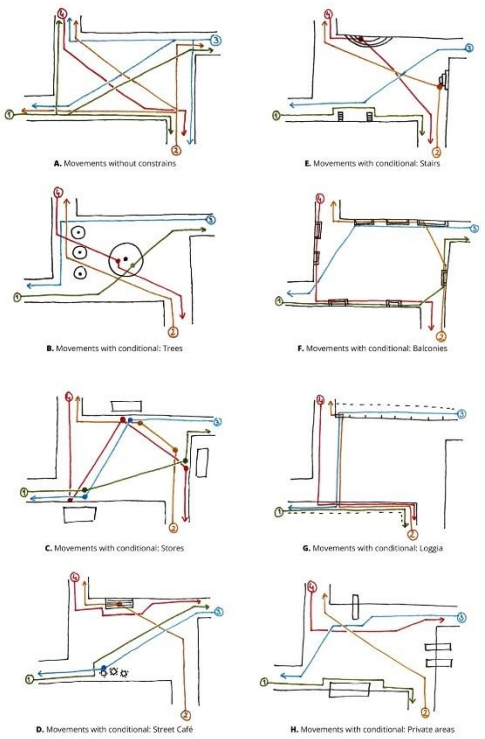


Figure 7. Schemes relating the formal elements to movement. Diana Gouveia Amaral

5. Representing informality

After establishing the observational criteria, the techniques of representing and synthesizing the existing and its dynamics are determined. Through drawing, the components are decomposed and graphically explored, demonstrating visually what is experienced in the site. Drawing is utilized as a method of observation and deconstruction since it is a tool of both Architecture and Urbanism, capable of communicating in both disciplines and therefore encouraging dialogue. Different modalities of representation are employed, moving from the broad to the specific, from the literal to the speculative (linked with the urban experience).

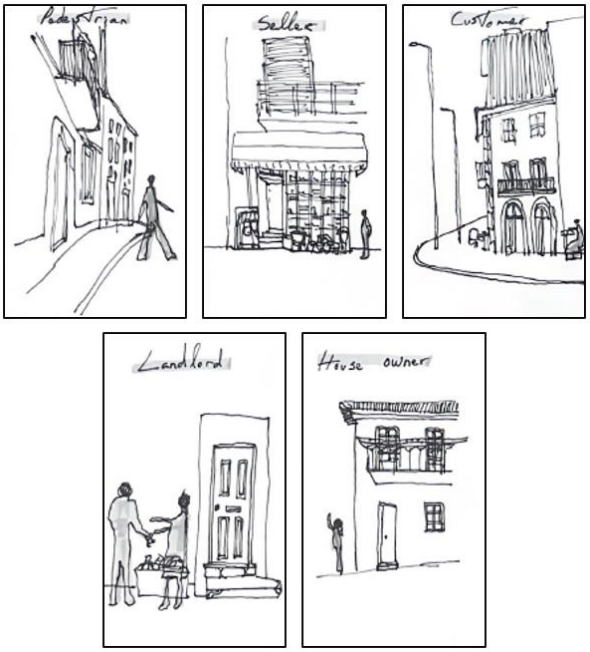
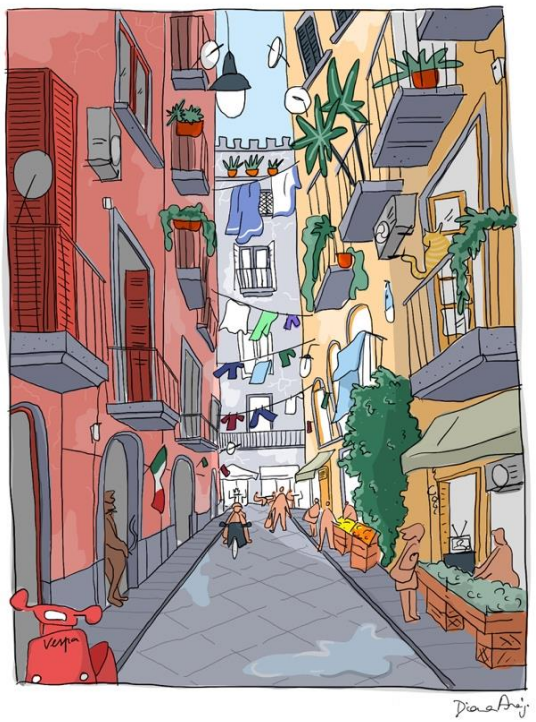


Figure 8. Deck of cards - Stakeholders intervening in the transition space. 2023. Diana Gouveia Amaral

The intrinsic tools of an architectural project, such as the section, the plan, the elevation, and the axonometries, make it possible 'to relate very distinct parts in the large scale and in the proximity scale' (Solà-Morales, 2021) illustrating the constructed elements and their functions.[13] In our research, this spans from elevations to constructional details. The research will next emphasize on the graphic representation resulting from the observation and exploration of alternative ways of formalizing informal elements in design in the case studies of Braga and Ghent.

By creative reproductions and representations from various disciplinary domains, an image of the ambiguity and personal experience is made feasible in an attempt to portray the atmospheres and dynamics that exist in the relationship between the façade and the surrounding uses, to construct a more accurate representation of the urban environment.[14]



1Figure 9. Appropriations as part of urban configuration. Napoli 2021. Diana Araújo

5. From informality back to design

We are in a time of changes, of looking back at what has been accomplished and designing a future that embraces all the instruments that technology provides us, together with the values of community, in order to enhance the life's quality by promoting flexibility, and diversity in cities. It is a moment when interdisciplinary collaboration and the use of available resources for effective intervention are encouraged.

In this way, the method presented does not provide a recipe for how to act generally; rather, it provides urban reading tools and synthesizes knowledge about the existing layers in the city, so reinforcing the relationship between the user, the building, and the city.

It allows for a reframing of the architect/ designer position as the driver of dynamics and also the user's role as the definer of the urban experience, the user

being the one who rewrites the urban environment through its usage. How therefore might the designer anticipate and encourage uses and appropriations? Can the outcome of this research be a reflection and representation of the design of uses, or should the product be a formula for future interventions?

Figure 10. Reuse of a ruin. Spain and India 2022. Diana Gouveia Amaral and Hashir Ahmad

Footnotes

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“Transitional Morphologies”. An Urban Paradigm

Martina Crapolicchio, Rossella Gugliotta, Michela Barosio, Marco Trisciuoglio - Politecnico di Torino

ABSTRACT
Time is not the only reference for studying and understanding the transition of spaces and places in a city from one order to another order. The urban form (with its grammar and syntaxes) can favour changes in one direction rather than another. However, it is always influenced by external forces that guide the city's transformation. The metamorphosis of the urban form owes a great deal to some ecological, economic, social, and political factors. Time and factors at the same, influence the city as a system led by a never-ending change. In this optic, the dialectic between permutations and permanence has been redrawn, moving the balance in a new direction.
A joint research unit, established between Italy and China in 2018 (between Southeast University in Nanjing and Politecnico di Torino) and particularly active in the PhD field, has dedicated studies, analyses, research and even projects to this topic. As a result, the term transition has been grasped, analysed and defined to develop procedures and methods helpful for the future transformation of the city.
The contribution aims to illustrate some of the joint unit studies, precisely one aimed at innovative diagrammatic representation of cities in transition as a (conceptual and instrumental) tool, and the other able to manage the development of cities' shapes in the future through innovative urban codes based on form. From this point of view, the transition is concretely addressed through the use of a diagram and urban coding. The first is an instrument to reconnect the shape and the relation on a multiscalar level. The second links the urban regeneration process inside the city centre and human needs. With this contribution are illustrated some of the goals of the Transitional Morphologies Joint Research Unit to ground flexible regeneration processes by describing and handling the meaning of the transition in the urban environment.

KEYWORDS
urban morphologies, mapping, diagram, rules, transitional morphologies

1. About Transition

The emergent phenomena of climate change, global crisis and social inequity have shaped numerous researchers in the urban environment into the processes of city change and transition (Zolfagharian et al., 2019). The title of the book 'Cities in Transition: power, environment, society' (Ding, 2015) highlights the influence of external factors in describing the transition of the contemporary city in the Information era. The term, thus understood, has the meaning of a process explained through a non-linear, and therefore dynamic, the transition that can be supported or hindered by an external system (Hölsher, Wittmayer, Loorbach, 2018). The concept of transition mentioned above defines the change between one regime and another passing through two different equilibrium states. (Rotmans et al., 2001). Therefore, transition as a phenomenon related to the concept of process, and consequently to time, but also linked to the external factors of the city is an inherent element in urban analysis when the research objective concerns investigating changes in the urban pattern.
The reading of the urban form, like the typological study, is based on diachronic recomposition in phases and typological permanences (Caniggia & Maffei, 1979). The use of the diachronic approach allows an understanding of the connection between the

settlement network and the territory and how this original structure changed through innovations consisting of introducing new factors and new settlement models. The study of urban form in its process of transformation over time provides an appropriate cognitive basis for the formulation of a new set of paradigms that trigger the urban regeneration of consolidated historical structures. Evolution is the lens through which urban development can be understood. The transitional morphological approach highlights three principles of the Italian school of Urban Morphology that can be used to modify the system of urban regulations and renew the link between the activities of studying form through the mapping of urban realities and planning through the definition of regulations. First, existing anthropic structures result from a process based on each diachronic and diatopic mutation (Maffei, 2011). Second, urban structures establish changing relationships with each other (Caniggia & Maffei, 1979). Thirdly, the structure and character of a city are the results of permanences and permutations at different levels (Caniggia, 1976).

Research approaches focusing on transition provide analytical and operational tools for understanding and developing interventions supporting or hindering the process of transition (Farla et al., 2012). For example, developing a new generation of urban regulations requires a deep and critical understanding of the mechanisms of form evolution and the analysis of the impact of regulations on the built environment. The development of a new representation tool also requires a critical understanding of how the transition process can be systematised and read. Studies and analyses on these topics have been carried out since 2018 by the joint research unit (Transitional Morphologies) established between Southeast University in Nanjing and Politecnico di Torino (Trisciuoglio et al., 2021). In this contribution, two approaches will be presented to entangle the relationship between transition and the built city by using two instruments to read the phenomenon: the diagram and urban codes. The two studies present different perspectives. The first shows how the reinterpretation of fundamental notions gives new meaning to urban transition studies. The second shows the application of the transitional morphological approach to an existing case study.

2. Diagramming transition

Defining the transition as a phenomenon based on time clarifies the succession of urban change. As previously mentioned, the transition can be considered a specific transformation process between two points, A and B, which are not equal but fundamentally different in shape and relations. In this analysis context, it is possible to identify a continuous balance change that demonstrates the transformation's dynamics. The ever-changing shift reveals the impossibility of defining the exact moment the transformation occurs (Neyant, 2019). From this consideration, there is a need to develop an operational tool to detect this becoming process. Following the Italian tradition of urban study, the research in urban morphology held by Saverio Muratori and Gianfranco Caniggia had since beginning the aim of developing methodology and tools to make the processes in the city readable (Caniggia, 1963; Muratori, 1959). The legacy of urban forms by the master of Italian urban morphology study used in this research explains the city, how it changes and its relation with the settlement history. The long-lasting tradition of urban study gives input to new research on methodological tools to overcome the complexity of the urban environment.

Diagramming transition is a process based on defining the characteristics of the tools used in the traditional studies of urban morphology in Italy. The aim is to go beyond and explore new ways of representing and describing, in

general, a dynamic phenomenon based on synchronic a diachronic reading. The study on tools would like to open up for further and more specific studies understanding how the transition process impacts urban patterns, the formation of the city, and its agency. The reflection through tools on transition allows reflecting on the phenomenon, not just as input from an analysis. The possibility of reading dynamicity leads the tool to be part of the transformation process. A generative tool that is useful for the analysis and defines its importance in the design process.

The primary element modified by diagramming transition to redefine the reading system of the city's shape is the map (Fig. 1). The map is a representative cartographic object of the built and natural landscape (Hall, 2006). For this reason, it has been one of the first instruments used by architects to represent a topographical space. Every map is unique because authors, methods, and information tell a specific story (Brown, 1949). It represents one of the fundamental objects through which the world makes sense and shapes a part of scientific discourse (Hall, 2006). However, the map is not made to be a direct imitation of the territory, but it always constitutes different images of the same object. Therefore, it has a precise purpose and is directed toward the answer to a problem (Palma, 2001). The map is operational (it serves a specific purpose), but in a certain sense, it can also be operative (with a propulsive value in mapping). The term operative can be assimilated with the adjective generative highlighting the diagrammatical function of the representation tool. Each representation that shows invisible, unreadable space and makes them visible can be considered a diagram (Gasperoni, 2020). Despite relating to maps and diagrams as images, it is more interesting to focus on their logical construction by discussing diagrammatical attributes.

Figure 1. Maps as a tool for analysis (a case study on San Bartolomeo maps by Saverio Muratori). Gugliotta R. (2022)

Exploring the logic of the map as a diagram means exploring the different possibilities of the diagram as a tool for representing a dynamic system. Defining the maps as a diagrammatical tool means adding the topology of the space to the topographical layer. It is similar to what Augusto Cavallari-Murat did in his Turin study, using graphs to represent the relation between the elements of the city. Acting on the diagrammatic logic of the maps, the three elements to consider are space, time and subject (Gugliotta, 2022). The final space of interaction between the city's shape is a multilevel image that explores each component relating to the territory, the city with the urban tissue and the building scale between a diachronic and synchronic time. The solution from this representation system is not a map or a diagram but a diagrammatical and interactive object showing the multiple possibilities of reading the transition. The diagrammatic character resulting from this logic can be relational, multimedia, information hybridisation, multiscalar and effect extension (Gasperoni, 2022).

From the decomposition of the transition process at different times and scales are distinguished permanences and permutation as the keypoint between maps and diagrams in the reading transformation process **(Fig. 2)**. Through what remains, it is possible to define the structural characteristics of each city, capable of making it recognisable (Aymonino, 1977). Instead, the possibility of variation opens up precisely because the replication mechanisms are not perfect (Ingold, 2019). From them, it is possible to define the

permutation that occurs in the system in transition. Diagramming transitions help define permanence as a simplification of a specific topographical space, recognisable on the map and in the urban tissue on a different scale. On the opposite, this process defines permutation as an upgrade of the permanences in a state of continuous change not just as a topographical space but also as an entity in the topological space of the transformation. In this context, the dichotomy between permanence and permutation as opposite states of the city's shape is broken, giving a new perspective on the transformation. The representation's new perspective through diagrams redefines permanence and permutation as the same notion of the shape related in different times. The concept of permanence in the city, one of the fundamental to understanding the city's structure, is a longtime permutation shifting the perspective on the reading of the city transition.

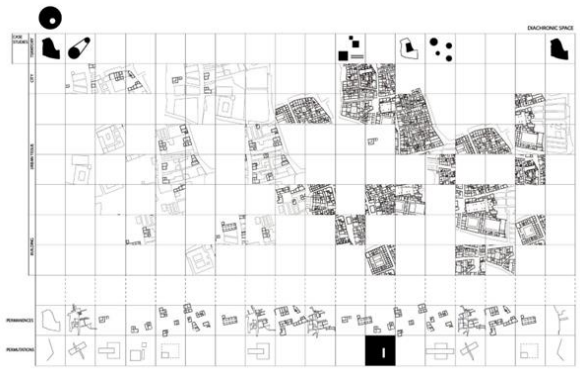

Figure 2. Diagramming transition. From maps to the diagram (a case study on San Bartolomeo maps by Saverio Muratori). Gugliotta R. (2022)

3. Coding transition

Historic environments are given priority today. Since the last few decades, the protection of cultural heritage has been a common concern of governments, associations and private individuals (Kropf, 1996). This attention has taken different forms. In Italy, for example, documents and codes have been drafted to protect historical and cultural heritage. As a result, planners and architects have faced the challenge of maintaining the identity character of places and integrating new forms within the historical vocabulary that belongs to heritage.

For this reason, it is not possible to consider the historical city as a single homogeneous block trapped in a forgotten past and an uncertain future (Pace & Cutolo, 2016). On the contrary, consolidated urban fabrics, such as those in historic city centres, constitute an excellent opportunity for investigation from both a formal and regulatory point of view. The results of such studies offer a narrative ranging from the description of the morphological transition to planning to the reconstruction of the links with architectural and urban design.

With these premises, the study of the historic centre of Rimini by the Transitional Morphologies Joint Research Unit is developed. In particular, within the Regional Law of Emilia Romagna framework, which orders each municipality to simplify existing urban codes and incentivise regeneration. In a consultancy role, the Research Unit of the Politecnico di Torino collaborated with the municipality of Rimini to draft the new General Urban Plan. Hence, the study focuses on the historical centre area to increase building capacity while preserving local identity and drafting new rules to trigger regeneration processes. Rimini is located on the northeastern coast of the Italian peninsula. It was considered a leisure city for most of the 20th century due to its expansion policy and coastal tourism. The city has some typical characteristics of cities on the Italian Adriatic coast, such as the 'diffuse city' parallel to the beach (Bianchetti, 2002), the presence of the railway, which is an explicit interruption of the cityscape, and the natural interruption by the rivers coming from the mountains (Apennines). At the centre of this system is the historical centre. The historic centre has a Roman cardo-decumanus layout with a compact urban fabric that extends into three

outlying districts located north and south of the cardo and west of the decumano (Gobbi & Sica, 1982). In addition, two essential elements of the Roman city persist, the Arco di Augusto, the old southern gateway to the city, and the Ponte di Tiberio, an outstanding piece of engineering and architecture that crosses the river in the north of the historic centre (Fig. 3).

Figure 3. Rimini's historical centre *built pattern* with indications of some Roman permaneces and outlying districts. Crapolicchio M. (2022)

However, the buildings that compose the urban fabric do not have any special features, with a few exceptions, as Rimini suffered severe damage after the bombings of World War II. As a result, the city's layout has remained almost unchanged over the centuries, while its components sometimes show considerable variations. However, current regulations in this part of the city have indistinctly preserved and protected the historic centre buildings.

These observations were conducted during the study's first phase through field surveys and redrawing old maps highlighting the city's evolution in phases.

The next step was to analyse the urban aggregates within the compact urban fabric of the historic centre. This analysis showed that most of Rimini's urban fabric is composed of perimeter blocks, i.e. curtain-like urban aggregations surrounded by four streets and featuring an inner court (collective or parcelled). The second category of morphological clusters belongs to linear aggregates. The linear aggregates present buildings arranged in line with street frontage and a courtyard at the rear. The three outlying districts, in particular, belong to this cluster. Another category is the urban fringe fabric. This cluster is morphologically generated by elements that create boundaries or limits (e.g. ancient walls and natural elements such as the river). The last two categories represent aggregates developed around a specific typology, special buildings and buildings unrelated to the surrounding urban fabric. Each morphological cluster was analysed through a study sample to understand not only its form through the transitional analysis but also its structural, structuring and existing rules (Fig. 4). Design trials were produced on each sample to test the possibilities in relation to standards.

Figure 4. Morphological clusters in Rimini and samples (1. Compact urban fabric with perimeter block; 2. Linear aggregation; 3. Fringe urban fabric; 4. Special buildings aggregates; 5. Unrelated building with the context). Crapolicchio M. (2022)

The designs produced show different characteristics depending on the sample analysed. For example, in the sample with

perimeter blocks, valuable buildings allow for prevalent interventions on roof renovations, internal facades and courtyards. Alternatively, in the linear aggregates, volume increases are allowed in proportion to the heights of the buildings on the street (Fig. 5). Finally, in aggregates with buildings that are extraneous to the urban fabric, blind façades permit the addition of volumes and surfaces according to the principles of air rights (Fig. 6).

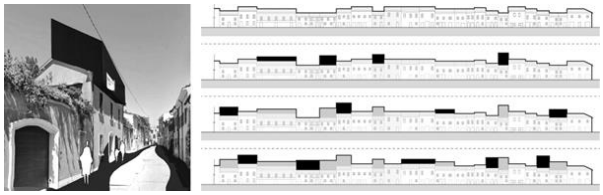

Figure 5. Design trial on the linear aggregates in the historical centre of Rimini. Crapolicchio M. (2022)

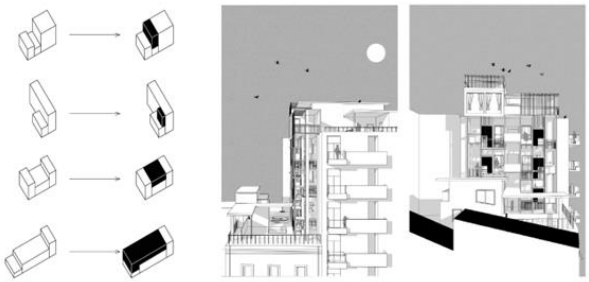

Figure 6. Design trial on blind facade with air-rights in the historical centre of Rimini. Crapolicchio M. (2022)

The regulations function as minimum requirements that allow deviations within the standards' limits (Kropf, 1996). Therefore, to regenerate a building or a group of buildings (in the historic centre of Rimini), it is first necessary to identify the morphological cluster to which the building belongs. Then, based on a design trial on the study sample of the morphological cluster in question, it is possible to identify the proper measures in the specific urban area. Based on this last consideration, it is necessary to identify the benefits of these operations for the promoters. Above all, it is crucial to determine the limits and quantities within which it is possible to increase building capacity in terms of gross floor area and volume. Hence, the preliminary study for forming Rimini's new General Urban Plan concludes with a summary table of these operations. Considering the model presented here, it is possible to open up the elaboration of guidelines based on the study of the formal transition to adaptively regenerate the existing urban environment. Thus, it is possible to define drawn urban codes designed to manage transitions and describe the potential of resilient rules in decision-making processes. The formulation of rules employing levels of resolution and types defined in terms of outlines, parts and their arrangement sets limits within which variation and change are possible. Within fixed outlines, different arrangements are possible, and within fixed arrangements, different parts are permissible. The notion of a permissible range of outlines, arrangements or parts makes it possible to tighten or loosen the limits by increasing or decreasing the ranges (Kropf, 1996). This study aims to understand and investigate the relationship between rules and urban form, which exerts its influence on the emergence and development of the contemporary historical city, without allowing these two categories of investigation to hinder excellence and innovation in the search for better places (Crapolicchio, 2022).

4. Conclusion

Transitional Morphologies Joint Research Unit's task is to ground adaptive urban regeneration design processes by describing the transition of urban form and its historical causes from economic, social and even symbolic value all over the world (Trisciuoglio et al., 2021). The two studies presented in this article show that the transition phenomenon influences the city on the map and the built city. Transition can be read and analysed from different points of view, on different types of urban environments, at different times, but above all, with different instruments. Both diagramming and coding look at the transition as an active and propulsive phenomenon and understand and manage with a look at the city's project. The project is recognised as a

decisive and operational tool led by time as a vector of formal anthropic changes (Maretto, 1980). Therefore, if time is the variable of transition connected to the shape of the project and the community, the city's metamorphosis also relates to ecological, economic, social and political factors hidden at first glance. Because of the complexity of the urban environment and the factors that influence both the transformation of the city and the design, to decode changes in the urban environment, it is helpful to provide some tools that help to read and guide the transition. The map is the primary tool for reading urban form because it highlights the permanences from one stage to the next. However, the shift to the diagram provides a brother interpretation of the concept of permutation in urban tissue, addressing not only the form as a shaper of the transformation but also the relation between parts of the city. Reading the reconstruction of formative processes leads to a proposable project of reality since the overall connections between the components are guaranteed by the homogeneity of a system derived from its historical developments. Another valuable tool to guide the transition is the rule. Communities are designed based on norms, and the form of the city contains the signs of collective memory. Understanding these two parameters of the construction of the urban environment means defining how places can or cannot be developed and how rules shape the physical space in which we live and work.
The diagram and the rule are two abstraction tools that relate the shape of the urban fabric, the building and the city over time to guide processes of innovation and urban regeneration and the generation of new shapes without providing a given solution but opening up the design to possibilities. Regeneration can be seen as a complex and transitional process, capable of preserving memory and improving the physical and social dimensions of areas in decline, but also capable of creating new values, capturing local changes and global dynamics, and seeing the shape of a city as provisional rather than fixed (Trisciuoglio et al., 2021).

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Consequences of Transitioning boundaries: From Rural to Urban Villages in the Growing City of Delhi

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ABSTRACT

Cities are dynamic; they develop, grow, and transition. Most cities grow both vertically and horizontally in terms of physical transformation. The boundaries of cities are likely to expand and transform the hinterland. The city's physical growth affects other city characteristics like land use, open-built space, lifestyle, occupation, social structure, environment, and economy.

The city of Delhi (India) is one such example that has continuously spread horizontally and grown by over five times in its area since 1951. As Delhi's population grew, the city spread physically and, in the process, engulfed the agricultural lands and the rural hinterlands. However, the village habitation was not displaced, and their boundary was demarcated as *lal dora*, literally meaning red thread, on the land records. The result was the formation of an 'urban village,' a rural settlement that was forced to adapt to non-agrarian means of living under the growing pressure of rapid urbanization. This process began in the early 1900s, but the decade of the late 1950s and early 1960s witnessed a massive scale of acquisition of agricultural land from farmers leading to the transition of the city limits. Thus, while there were only around twenty urban villages in 1961, more than 135 of them exist today.

The transformation of the urban city limits was accompanied by various abrupt changes like loss of livelihood and changes in lifestyle. These changes influenced the urban villages' physical and functional transformation, evolving them into current dense, unplanned, largely commercialized, inhabited islands with planned city regions around them. They differ from the slums and squatter settlements in terms of land tenure and infrastructure. The urban villages of Delhi exhibit a different kind of physical, social, and economic character as opposed to their adjoining planned areas. The homogenous social community in these villages has increasingly become heterogeneous with the influx of migrants and businesses, surpassing the original residents.

While all the urban villages have similar origins, each has a unique character due to different factors influencing their growth pattern, further contributing to the city's identity. They primarily act as sponges that absorb the pressures of in-migration and urbanization, thus helping the city become resilient and are an intrinsic part of the city fabric. However, these urban villages are reeling under the pressures of city growth with the shift in their livelihood, socio-economic conflict, changing land use, increasing densities, commercialization and gentrification, unplanned development, and inadequate infrastructure.

The paper will examine the urban villages' formation and transition. It will evaluate the interaction of urban villages with the planned settlements and the transformations they underwent to sustain themselves. Further, the paper will analyze the current situation/challenges of these urban villages, i.e., the pressures of urban growth (unplanned development, poor infrastructure, commercialization, and gentrification) due to the transition from rural to urban. Lastly, the study will reflect on the future of these urban villages, considering how these urban villages might transition into planned urban localities or degrade into slums under the various scenarios posed by the present conditions.

KEYWORDS

transition; urban village; Delhi; city; urban growth

1. Introduction

Cities are dynamic; they develop, grow, and transition. Physically they transform by growing vertically and horizontally. As a result, the boundaries of cities are likely to expand and transform the hinterland. When the urban areas develop or sprawl, the surrounding rural land is consumed unobtrusively and willingly (Mehra, 2005), or else public or private agencies acquire the rural land[1]. "In either case, the transformation of a habitat from rural to urban is a major qualitative as well as quantitative change (Mehra, 2005, p. 287)", affecting various characteristics of the urban area like land use, built open space, lifestyle, occupation, social structure, environment, and economy.

The process of acquiring just the uninhabited rural land and leaving behind the inhabited areas gives rise to the formation of urban villages in many countries of the Global South: a rural settlement that is forced to adapt to non-agrarian means of living under the growing pressure of rapid urbanization.

These urban villages of the Global South bear a stark contrast to the concept of urban villages of the Global North that developed during the 1980s in Britain as a response to decentralization and sprawl. The urban villages of the Global North are strategically planned 'ideal villages' within an urban setting that are medium-density, self-contained settlements emphasizing a high quality of life (Jauhari, 2017; Sheth, 2017). Such as Greenwich Millennium Village in London and Santana Row in San Jose–California (Sheth, 2017).

The urban villages of the Global South have a low quality of life and high migrant population, are unruly, informal, high-density, and lack basic amenities and infrastructure (Jauhari, 2017). These types of settlement pattern within the cities and urban settlements are evident all over the Global South, be it the Asian countries like China (Shenzhen, Guangzhou) and India (Delhi, Hyderabad, Bangalore, Mumbai), African countries of Nigeria, Nairobi or the Latin American nations of Brazil and Mexico.

This study demonstrates how the urban growth led to Delhi's urban boundary transition by rural land acquisitions, which formed a new typology of settlements: the urban villages, which evolved unpredictably to impact and influence the city's overall urban fabric, economy, and social structure.

2. Growth of Delhi: Transitioning urban boundaries

The national capital territory of Delhi is the world's second-largest urban agglomeration, with over twenty-nine million inhabitants (UN, 2018). It is one of the fastest-growing megacities whose urban growth can be attributed to its natural and migrated population growth and economic growth. As a result, the city has been steadily expanding its urban region boundary.

The transition in the city boundaries can be traced back to the early 1900s when the country was still under British rule. Villages were acquired, and communities were resettled to other regions to set up Delhi as the new capital of the British Empire.

After India gained independence in 1947, there was a sudden growth in the population of Delhi. The census of 1951 reveals a decadal growth rate of 107%. Thus between 1932 and 1951, the city limits underwent further extension by another 26 km by acquiring more rural lands to set up industrial estates and rehabilitation colonies for refugees (Sheth, 2017). A side effect of this was many skilled and unskilled construction laborers migrating into the city, owing to the government's fledgling development drive. Nevertheless,

[1] When urban boundary transitions horizontally to accommodate urban growth, the rural land can be acquired in two ways: acquiring the rural land and displacing/resettling the community or acquiring just the uninhabited rural land (like agricultural fields).

the government continued acquiring rural land around Delhi to accommodate the burgeoning urban population.

Since then, the urban area of Delhi has expanded from 201 sq. km in 1951 to 1114 sq. km in 2011 (Table 1); over seventy-five percent of the total area of the city of Delhi falls under the urban jurisdiction, and 98% of the inhabitants reside in the urban areas (Demographic Profile, 2017).

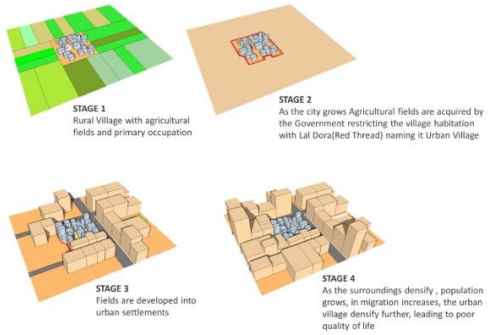

Figure 1 Stages in the formation of Urban Villages. Author

CENSUS	URBAN POPULATION		URBAN AREA			URBAN DENSITY	
	Population	Decadal Growth (%)	Absolute (Sq Km)	%	Decadal Growth (%)	Persons Per Sq Km	Decadal Growth (%)
1951	1,437,000	**107**	201	20	15	**7137**	79
1961	2,359,000	64	327	22	63	7225	1
1971	3,647,000	55	446	30	36	8172	13
1981	5,768,000	58	592	40	33	9746	19
1991	8,472,000	47	685	47	16	12361	27
2001	12,906,000	52	925	62	35	13957	13
2011	16,368,899	27	1114	75	21	**14698**	4

Table 1. Growth of Delhi's urban population, density, and urban areas over different census years. Compiled from Demographic Profile of Delhi,2017

3. Formation of Urban Villages

Until 1951, the government purchased the agricultural fields (*khasra*) and village habitation (*abaadi*) lands of villages, essentially displacing entire settlements. In contrast, after 1951, the government acquired only the residential part of the village by giving a nominal monetary compensation to its inhabitants. The boundary of the village habitation was demarcated as *lal dora* (red thread) on the land records. The government declared some *lal dora* villages as 'urban villages' and exempted them from various municipal development norms to keep their rural identity and community land ownership intact (Figure 1). However, the rural settlement was forced to adapt to non-agrarian means of living under the growing pressure of rapid urbanization.

Consequently, villages developed erratically, with rampant construction having significant vertical and horizontal expansions (Kumar & Bhaduri, 2018). The land just outside the *lal dora* which was still to be developed by the government agencies was also encroached by the villagers forming the *phirni* or the extended *lal dora* region. These extended encroachments were categorized as unauthorized colonies, blurring the physical delineation of the *lal dora* region (Pati, 2019). Most rural villages are now urbanized, with over 135 existing today (Figure 2).

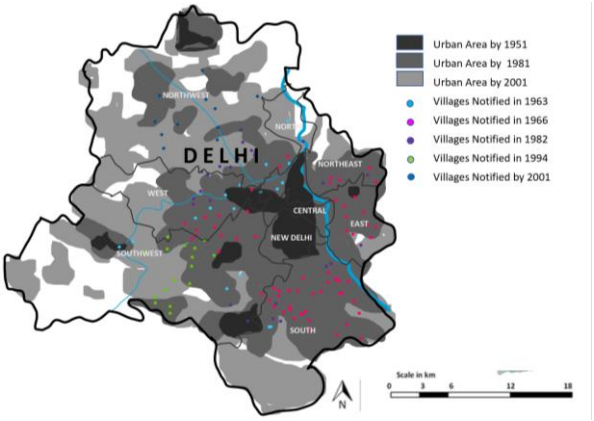

Figure 2 Expansion of Delhi's urban area through various years and the location of notified urban villages among them. Author. Based on Census 2011, Kumar & Bhaduri 2018, Master Plan of Delhi 2021.

Although, by 2011, the exemptions from building by-laws and development norms ceased, these urban villages continue to transform mainly because of the lack of awareness about government policies (Kumar & Bhaduri, 2018) and resistance amongst

urban village residents against any restrains (Pati, 2019).

4. The Transition and its implications

The transitioning urban boundary of Delhi that expanded through the acquisition of the agricultural fields of the rural villages (now urban villages) inhabitants was accompanied by various abrupt changes like loss of livelihood and changes in lifestyle. The procurement of their land, leaving the residential part untouched, influenced the villages' physical and functional transformation evolving them into current dense, unplanned, highly commercialized, inhabited islands within the planned city regions. However, these urban villages differ from the slums and squatter settlements in terms of securer land tenure and better infrastructure. These urban villages have similar origins and physical forms, yet each has developed a unique identity due to diverse factors influencing its growth pattern and is at different evolution stages. In addition, the transition in the urban limits has led to the urban villages' economic, political, physical, and socio-cultural transformation discussed further.

Political transformation

The rural villages mostly have a 'panchayat' system, with a few members from the village headed by a single person who is generally an elderly resident who resolves all matters of the village. However, when the village is notified as an urban village, the political system undergoes an immediate change, and the democratic processes of the municipality replace the traditional governing system raising similar issues related to the multiplicity of agencies that Delhi's urban areas already face.

Economic transformations

The economy drives significant transformations. The sudden loss of agricultural land stirred the village's economic base, leading to livelihood loss. The rural village, whose economy (income and employment) was purely based on agriculture and other primary sector activities, had no option but to transition from rural to urban means of livelihood. The economic disparity between the 'now' urban village inhabitants became more apparent as the affluent were able to move out of the village setting while still owning and further renting their property. However, the less affluent had fewer options; they opened small shops or sold off their holdings to sustain themselves. Such transformations led to the commercialization and later gentrification of some of the urban villages (Figure 3).

Figure 3 Excessive commercialization leading to gentrification and congestion in the urban villages of Shapur jat and Masjid Moth. Author.

Physical and environmental transformation

While the urban villages generally maintained their overall layout, the exemptions from development control norms transformed the village physically unpredictably and spontaneously (Figure 4). These villages can be spotted as islands of dense habitation with a density of 5-6 times that of surrounding acquired land (Datta, 2004). As the population of the urban village grew (due to natural growth and in-migration), the villages have developed complex mixed land use patterns with commercial, residential, and often small-scale industrial functions (Pati, 2019). Gradually, all the vacant pockets of land are filled up by haphazard developments; new constructions or expansions are happening regularly (Jauhari, 2017). Many houses have poor light and ventilation, constructed compactly to accommodate more people and accrue more economic benefits (Figure 4).

Some of the other concerns include issues of traffic congestion, waterlogging, encroachments, skewed built-open ratio, inadequate infrastructure (roads, water supply, electricity)

Figure 4 Pictures showing the haphazard urban form of Delhi's Urban Villages. Author.

Socio-cultural Transition

The rural villages have a distinct social character and a strong feeling of neighborhood and belonging compared to the other urban parts of the city, with different castes occupying the defined regions of the village. However, the influx of the migrant population and the gentrification of these settlements to accommodate the growing city has converted the homogenous villages into heterogeneous urban villages. In addition, the loss of agricultural lands has forced the residents to move to a non-agrarian lifestyle.

The urban villages are also repositories of the heritage of the earlier settlements of Delhi, its vernacular architecture, historical monuments, and cultural traditions, yet the traditionally styled buildings are being replaced with modern ones leading to the loss of historical identity, rampant construction, and encroachment have taken place within adjacent to archeologically protected monuments.

With few open spaces left, the streets of these urban villages have become the primary social space encroached by buildings yet perform as gathering spaces for interaction, playing grounds for children, and celebration lanes for festivals (Figure 5).

Figure 5 The streets of an urban village being used for festive processions, parking, and informal weekly markets. Author.

Transitions due to in-migration

The megacity of Delhi has a very high rate of in-migration owing to numerous better economic opportunities and improved quality of life. The city attracts migrants from nearby states who belong to various economic and social classes. However, the government has mostly been unsuccessful in providing affordable land or housing for the urban poor and the migrating population within a reasonable distance of their livelihoods. This has led to the burgeoning of informal settlements in the form of slums, squatter

settlements, refugee colonies, urban villages, and unauthorized colonies.

The urban villages primarily act as sponges that absorb the pressures of in-migration and urbanization. These urban villages have become lucrative areas for residential development and commercial activities. The urban village's property rates and rental values are still much lower compared to adjoining planned commercial areas. Owing to their prime location, connectivity with other city parts, and exemption from urban development norms and by-laws, some urban villages have emerged as cheap rentals for migrating populations and affordable housing options for middle-class populations. Some have emerged as high-end boutique showrooms and eateries, while some developed as godown spaces and small garment manufacturing workshops, depending on the demand from the surrounding formal areas. Many planned settlements thus rely on these urban villages for the services they offer at cheaper costs offering resilience and support to the city's urban growth thus being intrinsically linked to the city.

Increasing migrant tenants' population and business owners have gradually outnumbered original residents in many such villages, which has introduced new traditions and cultures linked to the new settlers of the urban village.

5. Conclusion and way forward

The growth and development of cities are inevitable. The urban boundaries of cities like Delhi have expanded to transform rural villages into urban villages to manage their urban growth. The transition has led to the loss of livelihood and changes in the lifestyle of the village inhabitant. The government and planners of the city could not predict the spontaneous growth and transformation of these villages into dense, unruly settlements which would be an intrinsic part of the city, at times helping in the transition and at times being an obstruction in the transformation of the city as it grows relentlessly. Some have become highly commercialized while some are heading towards gentrification, while the living conditions within most of the urban villages have deteriorated steadily and need urgent interventions before they have slum-like living conditions.

However, it is essential to realize that despite being under constant urban influence from neighboring urbanized areas, many of the urban villages have, over the years, developed themselves into self-sustained economies with retail, small business, industries, housing, healthcare, and education facilities. The migrant population is also an innate part of the urban village, significantly impacting its economy and socio-cultural character.

The urban villages provide a unique identity to the city's urban fabric; they are resilient, culturally grounded, inclusive, alive, and flexible (Jauhari, 2017). Thus, a participatory planning and design approach is required, involving the government, village inhabitants, and various other actors like real estate developers, business owners, and NGOs. In addition, planning interventions like restoration, redevelopment, local area development plans, and land pooling can be the way to promote sustainable growth of these urban villages.

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A transitional landscape: framing Montejunto-Estrela from Orlando Ribeiro's descriptions

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ABSTRACT

The present essay focuses on the territory explored in the PhD research entitled: *"Montejunto - Estrela: descriptions and representations of landscape from the work of Orlando Ribeiro".*

Montejunto-Estrela territory was defined and described by the Portuguese geographer Orlando Ribeiro (1911-1997) as the alignment of reliefs that diagonally divides Portugal Continental in two distinct climatic areas: the Atlantic north and Mediterranean south.

In this sense, is important to present a brief introduction to the geographer's work - fundamental to understand the territory under study - as well as to highlight the descriptive method he adopts in the analysis of the places he had studied. The descriptions selected and analysed about the mountains that constitute the territory under study, will be the starting point for a cartographic representation method, which crosses the geographical readings (of the author who defines this territory as an element of transition), with a contemporary reading in place.

It is important to simultaneously build a synthesis, a new mapping of this territory on its continuity, demonstrating the specificity of this set through new cartographies in a larger scale. In such a broad geographical context we turn to the architect Manuel Solà-Morales to pose the question of the essay: *"is it possible to draw a country? What would be the architectural expression of a territory? And how would one draw that image*?[1]

We intend to expose an essay that will try to respond by drawing to the questions raised applied to the selected territory e context.

KEYWORDS

Montejunto-Estrela; transitional landscape; cartography; description.

Introduction: a brief look at the work of Orlando Ribeiro

By defining the *Montejunto-Estrela* territory as a continuity, a line of mountains that connect the Atlantic coast to the border with Spain[1] (Figure 1), Orlando Ribeiro acquires a central role in the proposed essay. Quoting the author, this territory is "(…) *the dividing line between the two parts of the country*"[2], where the climatic factor is a preponderant element of analysis: "*by gradual transitions, one passes from regions that receive abundant rainfall, only rare in two summer months, to regions of scanty rainfall, where the hot and dry period lasts almost half the year.*"[3]

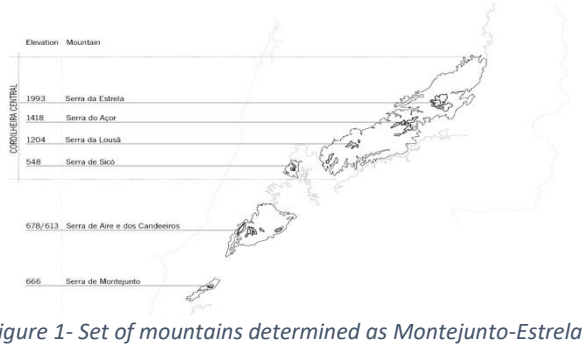


Figure 1- Set of mountains determined as Montejunto-Estrela

[1] Solà-Morales, Manuel. (1989). The Culture of description. Perspecta V.25, P.16-25. Cambridge: The MIT Press, p.16.

[1] That continuity crosses the following hills: Sintra, Montejunto, Aire e Candeeiros, Sicó, Lousã, Açor and Estrela.

[2] Ribeiro, O. Lautensach, H., Daveau, S. (1998). Geografia de Portugal, Volume I – a posição geográfica e o território. Lisboa: Edições Sá da Costa (4ª ed), p.135.

[3] Ribeiro, O. Lautensach, H., Daveau, S. (1998). Geografia de Portugal, Volume I – a posição geográfica e o território. Lisboa: Edições Sá da Costa (4ª ed.), p.26

To understand the author's framework, we organize his bibliography in two different scales: the first, more territorial, intends to define, frame, and reinforce *Montejunto-Estrela* as a territory that distinguishes different morphologies of landscape; and the second scale approaches the description of places, through textual and drawing records.
We also base the analysis on time. The author wrote his first articles in 1932 and until 1945 he had many years of intense fieldwork throughout the country (this time will be the focus of our analysis). These travels around Portugal made him publish in 1945 his most relevant book: *"Portugal, the Mediterranean and the Atlantic"* a "*draft of geographical relations*"[4], where he defines the Mediterranean and the Atlantic as fundamental territorial influences for reading the country's geography. In that way, he frames Portugal in the Mediterranean world, define the Atlantic Ocean as an important climate's regulator and conclude focusing on the contrast between North and South, perceiving the diversity enunciated when looking at both sides of this *edge – Montejunto-Estrela*. The importance of this statement makes us question: how do we characterize this territory *between*? How do we draw its form, limits and its specificity?
In *"Geographical position and territory"* and *"Climatic rhythm and the landscape"*[5] - both publications with broad readings of the territory - a first image of *Montejunto-Estrela* is drawn. The Figure 2 presents a map overlay, a collage from the publications referred, setting a first layer of knowledge about this group of mountains. In those publications, the authors make an analysis and re-reading of the territory human occupations, focusing on the geomorphological formation of the places and in the characteristics of the landscape influenced by the climate - either by the geographical position of the country (as explained) or by the acceleration of climatic processes.
In an overall reading, Orlando Ribeiro reveals the importance of reading the territory in its various temporal layers, reinforcing the study of geomorphology and the fieldwork as tools capable to interpret the contemporary landscape.
Thus, his methodological principles are also important to highlight: the fieldwork (1), a broad reading of the landscape (2), and the transdisciplinary approach (3) reflected in his work. We intend to revisit them - both publications and method - to understand how to approach the landscape and how this set is understood as a boundary characterizing, in that way, the orographic continuity of *Montejunto-Estrela*.

2. From geographer's records to *in situ* mapping – a representation method

The approach and the Orlando Ribeiro's records will be the support to draw a first and fundamental interpretation of the *Montejunto-Estrela*, perceiving the specificity of this transitional territory, defined as a boundary between climate-influenced differences in the morphologies of the landscape.
As methodology it will be fundamental to collect[6] and systematize the relevant information found in Orlando Ribeiro published work (drawn or written) which with its strong descriptive component will be translated into new cartographies, new maps that highlighting themes such as human occupation, settlements and materiality or the transhumance of life in the mountains.

[4] Ribeiro, O. (1945). Portugal, o Mediterrâneo e o Atlântico. Lisboa: Sá da Costa Editora, 7ª Ed., subtitle.
[5] Ribeiro, O. Lautensach, H., Daveau, S. (1998). Geografia de Portugal, Volume I, III, IV – Lisboa: Edições Sá da Costa (4ª ed.)
[6] This gathering will be made in the Library of the Centre for Geographical Studies of Lisbon, due to the variety of publications and scientific journals present in its catalogue and in the National Library of Portugal, place that contains the author's work legacy.

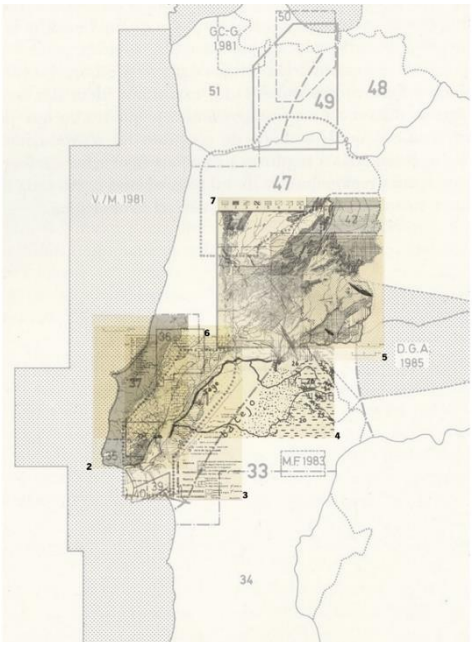


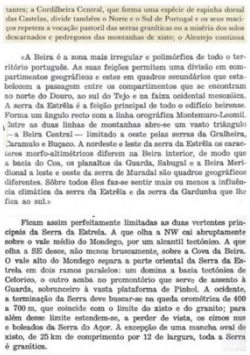
Figure 2 - Map overlay: first information layer of the territory under study. Marisa Fernandes.

Those selected records give also clues to different scales of approach and with them we will draw new *interpretative maps*, that intersect the landscape descriptions found, and a first interpretation of the place taken from the reading (Figure 3[7] is an example of this method). In a second moment, those first sketches will be a base to another cartography that expand the disciplinary knowledge, and which reflects the observation and the findings of the fieldwork.

An example of a similar approach, that combines literature, architecture and landscape is the research project "*Atlas of the Literary Landscapes of Portugal*"[8], a project whose aim is characterize the Portuguese territory through the text of several poets. It adopts an experimental and sensorial character creating, on one hand, a database that locates the collected excerpts (literature produced between the mid-19th century and the present day) on a map (in web application format) and, on the other hand, organize *walkshops* and conferences to approach people with the landscape they inhabit. Also, the international research project "*Writing Urban Places*"[9] is other example, focusing on combining literature with the experience of walking through cities to create new narratives about the it.

The present research follows these principles and stresses the fundamental importance of a geographical reading as a starting point, together with the recognition of places through fieldwork. That combination creates the representation's method of this study.

In this regard, we expose an example that tests how cartography can simultaneously


tantes; a Cordilheira Central, que forma uma espécie de espinha dorsal das Castelas, divide também o Norte e o Sul de Portugal e os seus maciços repetem a vocação pastoril das serras graníticas ou a miséria dos solos descarnados e pedregosos das montanhas de xisto; o Alentejo continua

«A Beira é a zona mais irregular e polimórfica de todo o território português. As suas feições permitem uma divisão em compartimentos geográficos e estes em quadros secundários que estabelecem a passagem entre os compartimentos que se encontram no norte do Douro, ao sul do Tejo e na faixa ocidental mesocénica. A serra da Estrêla é a feição principal de todo o edifício beirense. Forma um ângulo recto com a linha orográfica Montemuro-Leomil. Entre as duas linhas de montanhas abre-se um vasto triângulo — a Beira Central — limitado a oeste pelas serras da Gralheira, Caramulo e Buçaco. A nordeste e leste da serra da Estrêla os caracteres morfo-altimétricos diferem na Beira interior, de modo que a bacia do Côa, os planaltos da Guarda, Sabugal e a Beira Meridional a leste e oeste da serra de Muradal são quadros geográficos diferentes. Sôbre todos êles faz-se sentir mais ou menos a influência climática da serra da Estrêla e da serra da Gardunha que lhe fica ao sul.»

Ficam assim perfeitamente limitadas as duas vertentes principais da Serra da Estrela. A que olha a NW cai abruptamente sobre o vale médio do Mondego, por um alcantil tectónico. A que olha a SE desce, não menos bruscamente, sobre a Cova da Beira. O vale alto do Mondego separa a parte oriental da Serra da Estrela em dois ramos paralelos: um domina a bacia tectónica de Celorico, o outro acaba no promontório que serve de assento à Guarda, sobranceiro à vasta plataforma de Pinhel. A ocidente, a terminação da Serra deve buscar-se na queda orométrica de 400 a 700 m, que coincide com o limite do xisto e do granito; para além desse limite estendem-se, a perder de vista, os cimos nus e boleados da Serra do Açor. À excepção de uma mancha oval de xisto, de 25 km de comprimento por 12 de largura, toda a Serra é granítica.

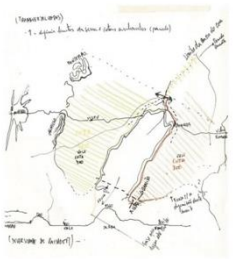


Figure 3 - textos de Orlando Ribeiro e primeiro mapa interpretativo a partir dessa leitura

combine the geographic descriptions and the information collected in fieldwork. Estrela mountain its's the highest and longest mountain range of the territory under study, *"is located on a climatic boundary of the utmost importance"*[10]. The texts read indicates the analysis of this mountain at two different scales. The first related to the definition of its limits describing the edge and the altimetric height at both sides of that hill: *"The two main slopes of the Serra da Estrela are thus perfectly limited. The one that looks*

[7] Figure 3 reflects the selection and transcription of the texts from author's different publications into a first drawing, a draft that revels the topographic conformation of the *Estrela mountain* and its territorial limits.

[8] https://ielt.fcsh.unl.pt/paisagensliterarias/

[9] https://writingurbanplaces.eu/about/

[10] Ribeiro, O. (1995). Opúsculos Geográficos. VI Estudos regionais. Lisboa: Fundação Calouste Gulbenkian, p. 340.

to NW falls abruptly on the medium valley of the Mondego, by a tectonic cliff. The one that looks to SE descends not less abruptly, on the cova da beira (...) To the occident the end of the mountain range must be found in the orometrical fall of 400 to 700m, that coincides with the schist and granite limit; beyond this limit the bare and rounded summits of the Serra da Açor extend as far as the eye can see"[11].

The second, in a closer scale, focuses the geomorphology where the *"galician vestiges, (...) are confined to the highest altitudes (...)"*[12], aspect that were preponderant in fieldwork observation.

This phenomenon is clearly visible in the marked mountain ridges, highlighted by the relationship between the glacial valleys and the implantation of the settlements that often culminate in fertile agricultural valleys. The strong boundary between granite and schist stone referred by the author was also clearly observed, an alteration in materiality which is quite visible in the landscape as one travels along the slopes (Figure 4 shows the photographs taken during fieldwork showing the different materiality observed).

FFigure 4 - The different materiality. Fieldwork carried out in December 2021. Marisa Fernandes.

The fieldwork crosses the foothills of the mountain, experiencing the body the same enclosure of the hills when crossing the narrow streets of the villages, perceiving the rupture of the materiality, as explained, and then creating our own cartography highlighting the relevant aspects exposed: the topography and geomorphology linked to the implantation of the settlements; the trails and paths travelled, flagged as a record and the water: present characteristic throughout all the visit (as drawn in Figure 5).

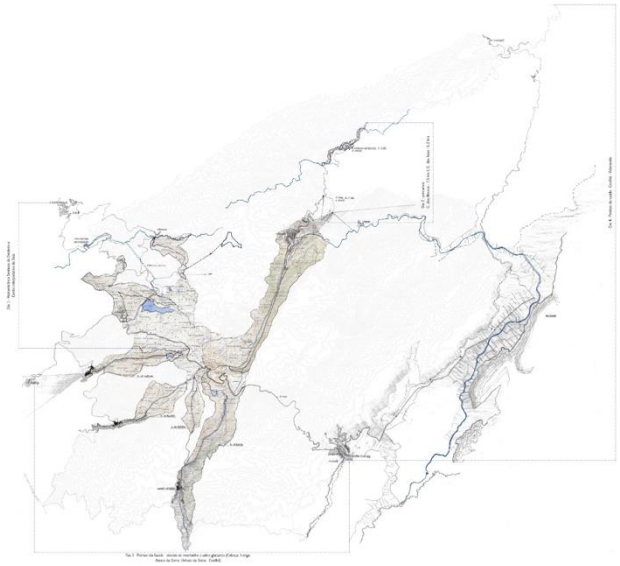


Figure 5 - Fieldwork draw at Serra da Estrela, highlighting the detours, the glacial valleys and topography.

This example of the Estrela Mountain demonstrates what we are trying to discover along this continuum of mountains. At this point of the approach the parts of this mountain chain are drawn, but the research intends to build simultaneously a synthesis where the discoveries and characterization of the whole can be read. Thus, another challenge is raised: the large-scale representation - since we are studying a territory with a five hundred and sixty km extension.

3. Cartography – an approach to large scale

[11] Ribeiro, O. (1995). Opúsculos Geográficos. VI Estudos regionais. Lisboa: Fundação Calouste Gulbenkian, p. 335.

[12] Ribeiro, O. Lautensach, H., Daveau, S. (1998). Geografia de Portugal, Volume I – a posição geográfica e o território. Lisboa: Edições Sá da Costa (4ª ed.), p.198

The correlation establish between geography and drawing seeks to reflect on two fundamental points in the research process: cartography, a tool of architecture that attempts to represent and interpret the places along this *limit* territory (continuity of hills that is not drawn on a map as such); and fieldwork - recording the trips where walking is a cartographic tool. Aspects that have been highlighted throughout the essay.

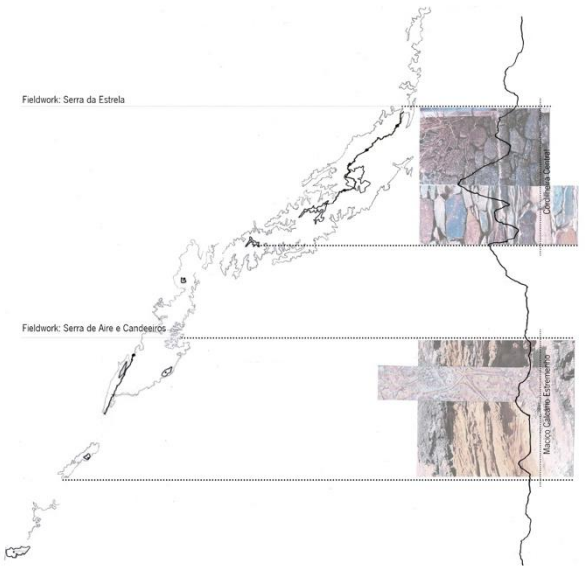


Figure 6 - Extension of the Montejunto-Estrela territory. A first cartographic essay of the set. Marisa Fernandes

To reach a synthesis of this territorial extension, the mapping begins with the study of the parts, highlighting particular aspects discovered with the approach to each mountain (Figure 6 highlights the geological aspects, relevant feature in the description of both places identified – Estrela e Aire and Candeeiros mountains). In this way, we try to position the research in the disciplinary scope of architecture, exposing references with a similar territorial approach, but whose registration method diverges.

Besides the geographer Orlando Ribeiro, Duarte Belo[13] is the only contemporary author who addresses the same territory of this research. Combining walking and photography he covers the peaks of the *Montejunto-Estrela* territory, with the aim of recording the diversity of this mountain. In "*Oblique Walking*"[14] the author not only focuses on the perception of the landscape - of which he denotes its fast transformation - but it is also the act of walking that is relevant in the discourse, often highlighting the topography - describing the difficulty of the gradients on the path or the presence of plans for overnight accommodation - and the visual references of the following mountains, to orientate himself in the walk. In the publication mentioned, this line is recorded on the continuous route along the summits of the group of mountains. The author defines the route as with the same principle here exposed "*the line that divides Atlantic Portugal, to the north, from that other half country to the south, of climatic influence from the Mediterranean basin. (...) distinguishes two realities that intertwine in a relatively small territory, but of extraordinary landscape diversity.*"[15], as we have been highlighting in Orlando Ribeiro's speech. In addition to the walk, the documental rigour and the archive method present in Duarte Belo's work are also considered relevant for the organisation and systematisation of the collection in the broad territorial scope he proposes.

We seek for a possible definition of this territory on the map, widening and contracting its configuration and trying to recognise its limits, not only observing the mountain stream line. The time of the journey is also extended to the act of mapping, recognizing cartography as the main tool for recording.

In the topic presented the search for a representation method is relevant. With the same concern, we now reflect on the work of

[13] Portuguese architect and photographer.

[14] Belo, D. (2020). Caminhar oblíquo. Lisboa: Museu da Paisagem.

[15] Belo, D. (2020). Caminhar oblíquo. Lisboa: Museu da Paisagem, p. 8.

Viollet-le-Duc (1814-1879) on the study of the Mont Blanc Massif (1976). Between 1868 and 1876, during the summer, he studied the shapes, light and shadow of this mountain, having set himself the first objective of constructing a complete map of the region, from which resulted a chromolithographic plan of the massif: a representation as if he were observing the whole seen from above. The survey is based on close observation of the structural forms that make up the mountain, deliberately emphasized in the drawing it presents. He also intended to make the geomorphology of the massif visible, by drawing creases, peaks and ruins that enunciate the phenomena that have shaped the mountain structure over time (glaciations, depressions, granite weathering). It is worth highlighting the search for a method of representation for an object of study that is no longer the building but the natural environment of Mont Blanc. The architect has combined principles and knowledge of geology and geomorphology to understand phenomena and from them decode the shape of the mountain by careful observation and recording in situ over several years.

Should also be highlighted the point of view from which we position ourselves. Viollet-le-Duc seeks an aerial view representation, an innovative draw at the time. And as already mentioned, the experience of observing in place is the basis for understanding the territory under study. Thus, we look from the two views: from above like the example exposed, and looking down, understanding and mapping the proximity with the place (Figure 7).

Following this thought, Corner[16] also presents both positions in a visual and descriptive survey of the landscape, by exposing the measurements of American according to different zooms. He begins with the aim of showing the variety of landscapes, having divided the territory by geographical areas for the survey, but not for the exhaustive detour on the ground (although he covered some kilometers by car and on foot), but to fly over it by plane.

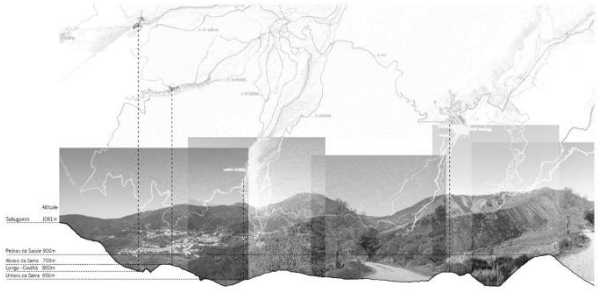


Figure 7 - Walk through Alforfa glacial valley - the view from the ground. Marisa Fernandes.

The measure, as concept, and the argument for the first part of the publication are determined from above. Thus, it presents a more theoretical construction about the methods of settlement that resulted in the actual landscapes, the territorial networks that are established through it, and he investigates cartography as a tool for the interpretation of the themes collected. The second part presents these points through illustrated essays that create fresh perspectives on the gathered landscapes at the point where text, map, and aerial image are connect in a draw.

The publication's overall strategy aims to highlight reciprocities between the tools suggested for communicating the essay and characterizing the landscape by human occupation, a representation that according to Corner[17] is difficult, often due to the architect's distance from the place and the consequent abstraction and function of the

[16] Corner, J. Maclean, A.S. (1996). Taking measures across the American Landscape. New Haven and London: Yale University Press.

[17] Corner, J. (1992). Representation and landscape. Theory in Landscape Architecture. Philadelphia: University of Pennsylvania Press.

drawing produced (which we are trying to counteract in the approach of the presented research).

In some points to conclude, investigate the *Montejunto-Estrela* territory is to understand the conformation of this alignment of hills which diagonally divides the country into two climatic influences (Mediterranean and Atlantic), but also to study the definition of its limits and the different possibilities to draw it specificity.
We expose a reading of this boundary landscape in different distances, times and scales because the topic presented seeks, thus, to question the condition of *Montejunto-Estrela* as a transitional territory, and it is through cartography that we will try to give a contribution, by drawing this territory from the descriptions of the geographer who identifies it, in dialogue with a present drawn interpretation, unfolding different scales and times of analysis and, in synthesis, contribute to a new description of places through the *Montejunto-Estrela* territory in the contemporary context.

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Salus Space – Reflections on co-dwelled ecologies

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ABSTRACT

The term *cohousing* was coined in the 80's by the American architects Durrett and McCamant, after their visits of the danish *bofaellesskaber*[1]; defined by Lietaert as «a specific form of neighborhood where private homes and common services are combined in order to guarantee everyone's privacy and at the same time the needs for sociality. » (Lietaert, 2007: 5).

Through the last years this dwelling practice has gained attention from local institutions, which started to use it as an experimental tool to contrast some of the major geo/eco-political challenges of our continent and their consequences in the urban and peri-urban spaces. Cohousing has indeed been more and more associated with processes such as urban regeneration, inclusivity and the green transition, in the larger perspective of creating an eco-socially more sustainable way of inhabiting our cities.

Departing from such context, this article explores the practice of cohousing through the ethnographic *case-study* of the institutionally led cohousing "Salus Space" (*Figure 1, 3*). Situated in the Bologna's expanding periurban area Fossolo-Due Madonne (*Figure 2*), Salus Space was born from a co-design process between 16 private and public partners[2], coordinated by the Municipality of Bologna and founded by the European program Urban Innovative Actions (UIA). The structure, inaugurated in January 2021, today hosts a community of fifty-six inhabitants, selected through social mixing, sustainability and motivational criteria.

As stated on the UIA official form[3], the project's goals (refugees/migrants inclusivity, responding to demographic changes, fighting urban/social decay, etc.) well inscribe themselves among the ongoing eco-political transitions we're all experiencing.

Different levels of transition happen to be entangled in the specificity of the cohousing experimentation as glocal transitions get concretely realized in such space: changes in the texture of the periurban territory, as well as in the textures of the material spaces we dwell and the relations with other (non-human) dwellers, but also the subjective transitioning into the cohousing structure and the transitional nature of the Salus Space project itself, given its experimental nature. These are some of the dwelling transitions constitutive to the material-discursive network that gives life to Salus Space's socio-ecological niche.

In this article such entanglements – and the interference patterns that emerge from them - are mapped through *diffractive ethnographic methodologies* (Guillon, 2018), proceeding to fill the gaps in cohousing literature, mostly coming from architectural and normative perspectives (Hagbert,

[1] The first *bofaellesskaber* appeared at the end of the 60's from collective progressive movements in the form of «lowrise-dense-clustered housing» (Beck, 2020). Vestbro translates the term from danish as: «a consciously created mini-society consisting of fully equipped private homes, supplemented by common facilities. Typically a bofaellesskab is planned, owned and managed by residents» (Vestbro, 2010: 26)

[2] «ACLI Bologna, Antoniano Onlus, Aquaponic Design Associazione di Promozione Sociale costituita come spinoff del Dipartimento di Scienze e Tecnologie Agro-alimentari (Distal), ASP Città di Bologna, Cooperativa Sociale Cidas, Associazione Cantieri Meticci, CEFAL Emilia Romagna Società Cooperativa, CIOFS FP Emilia Romagna, CSAPSA Cooperativa, Eta Beta Cooperativa Sociale Onlus, ICIE Istituto Cooperativo per l'Innovazione Società, IRS Istituto per la ricerca sociale, Microfinanza Srl, Associazione Mondo Donna Onlus, Open Group Cooperativa Sociale Onlus, Società Dolce coop, Università di Bologna – DAMSLab.»
From «*SCHEMA DI ACCORDO PER LA GESTIONE COLLABORATIVA DEL COMPLESSO SALUS SPACE*»; Available at https://saluspace.eu/old/documenti.html (last access: 16/05/2022)

[3] https://uia-initiative.eu/en/uia-cities/bologna (last access: 16/05/2022)

Larsen, Thörn, Wasshede, 2020: 4). Indeed, taking inspiration from Ingold (2000), Guattari (2000 [1989]) and Haraway (2016) the cohousing can be seen as a dwelling practice intended as *sympoietic coexistence* with diversity, migrant subjectivities often marginalized and other non-human ones that break into the daily urban life through the concept of a larger ecological crisis. Through these processes, different kinds of boundaries become subjects of re-negotiations: the boundaries of the city (challenged by the changing relational dimensions between the city and its surroundings), those between the cohousing and the neighborhood, the private and the common areas, the subjects and the community. Boundaries that can then be contextualized following the concept of ecology as intended by Guattari: an ecology of subjectivity (1), linked to the precarious inter-subjects relations generated by the *fluidity of modernity* (Bauman, 2011[2000]) and at the same time influenced by the ontological anchoring (Bosis, 2020: 79) provided by the *locus oikos* which is seen a conglomerate of practices but also as «creation and process, emotionally connotated, of meaning attribution» (ibid.); a social ecology (2), impacted by the special precarity of migration phenomena which materialize locally through *displacement/emplacement* processes that characterize the neoliberal living restructuring[4], to which cohousing projects can sometimes contribute or, other times, oppose - by becoming a tool giving rise to *sociabilities of emplacement* (Caglar, Glick-Schiller; 2018: 124); and, finally, the environmental ecology, that takes in consideration those complex assemblages of (peri)urban inhabitants *more-than-human; more-than-animal; more-than-plant and so on* (Hinchliffe, Whatmore, 2006: 128).

KEYWORDS
cohousing, dwelling, social ecologies, urban regeneration.

1. Introduction: dwelling precarious transitions.

During the last two decades, cohousing has gained attention from local institutions, which started to use it as an experimental tool to contrast some of the major geo/eco-political challenges of our continent and their consequences in the urban and peri-urban spaces. Indeed, cohousing has been more and more associated with processes such as urban regeneration, inclusivity and the green transition, in the larger perspective of transitioning toward an eco-socially more sustainable way of inhabiting our cities (Durante, 2011; Tummers, 2017; Scheller, Thörn, 2018). The times we live in are therefore characterized by transitional features that often happen to be experienced as precarious: a state that manifests itself through the existences of humans and non-humans – as we cannot avoid anymore to look at the intimate connections between the two (Braidotti, 2014; Tsing, 2015; Balzano, Bosisio, Santoemma, 2022) – in various ways. For the former, we could think about job exploitation[1], forced migrations generated by complex global inequities, lacking of housing availability and so on; for the latter (our non-human companions), in the sadly omnipresent and more and more urgent environmental crisis, which is causing disappearing of entire ecosystems and the extinction of an

[4]Caglar and Glick-Schiller, building on Harvey, identify the nexus between capitalism and *displacement* in the *dispossession* process: «accumulation through dispossession is justified by the categorization of those who have generated value as less than human.» (Caglar, Glick-Schiller; 2018: 17-19)

[1] Which soon comes to mind if we think about Standing's *precariat* as a new socio-economical class: «It consists of people who have minimal trust relationships with capital or the state, making it quite unlike the salariat. And it has none of the social contract relationships of the proletariat, whereby labour securities were provided in exchange for subordination and contingent loyalty, the unwritten deal underpinning welfare states.» (Standing, 2011: 8)

increasing number of species[2]. The city itself becomes a place where this precarious acceleration takes place and where related transitional initiatives emerge, for example, as responses to the precarity of dwelling, and become materialized in the *displacement/emplacement* movements[3] characterizing neoliberal processes of living restructuring, which can include gentrification, urban restructuring and rebranding (Marabello, Riccio, 2020).
Anthropology, through its ethnographic means has been "conceptually mapping" these processes, feeding itself of insights outside of the discipline's boundaries, adopting an analytical approach that is multidimensional (Pitzalis, Pozzi, Rimoldi, 2017) as well as "multiscalar" (Altin, 2020; Eriksen, 2017; Caglar, Glick Schiller, 2018), moving from macro-issues - like the ones just cited - to their embodiments in urban areas and, scaling down even more, by looking at specific dwelling practices/or tools such as the cohousing that constituted the main object of this research, where such entanglements – and the interference patterns that emerge from them - were mapped through *diffractive ethnographic methodologies* (Guillon, 2018), proceeding to fill the gaps in cohousing literature, mostly coming from architectural and normative perspectives (Hagbert, Larsen, Thörn, Wasshede, 2020: 4). This paper adopts such methodology and is supported by ethnographic research tools, as the four months ethnographic fieldwork consisted mainly of semi-structured, extensive interviews and participant observation.

2. Cohousing: a sustainable dwelling method
The term *cohousing* was coined in the 80's by the American architects Durrett and McCamant, after their visits of the danish *bofaellesskaber*[4]; defined by Lietaert as «a specific form of neighborhood where private homes and common services are combined in order to guarantee everyone's privacy and at the same time the needs for sociality» (Lietaert, 2007: 5). The particle "co" can be understood as «collaborative, cooperative, collective or communal», thus intending with the world a general housing form that includes various intensities of the sharing features (Vestbro, 2010: 25). By looking at the literature on cohousing it is possible to notice the many ways in which this tool has been recently appreciated by both private and public actors as a good compromise to transit from the many issues characterizing our cities to a somehow regenerated, new way of experience the urban dwelling. In this paper I want to focus mainly on two, connected, aspect of this series of issues: broadly, the social one and the ecological one.
From the first point of view, it is possible to look at the cohousing as a tool for the constitution of *sociabilities of emplacement* (Caglar, Glick-Schiller; 2018: 124) which can be imagined as social ecologies linked to the emplacement processes, amongst which dwelling as well takes place. Indeed, Caglar and Glick-Schiller describe how the proximity

[2] For some years scientists have been talking about the so called "sixth mass extinction", caused by a mix of human activities: «co-opting resources, fragmenting habitats, introducing non-native species, spreading pathogens, killing species directly, and changing global climate.» (Barnosky et al., 2011)

[3] I am referring here to Caglar and Glick-Schiller, who follow Harvey's when identitying the nexus between capitalism and *displacement* in the *dispossession* process: «accumulation through dispossession is justified by the categorization of those who have generated value as less than human.» (Caglar, Glick-Schiller; 2018: 17-19)

[4] The first *bofaellesskaber* appeared at the end of the 60's from collective progressive movements in the form of «lowrise-dense-clustered housing» (Beck, 2020). Vestbro translates the term from danish as: «a consciously created mini-society consisting of fully equipped private homes, supplemented by common facilities. Typically a bofaellesskab is planned, owned and managed by residents» (Vestbro, 2010: 26)

factor can promote the rising of such social ecologies through a renewed sense of community – or should we say, *conviviality*[5]– involving people from very different backgrounds in moments where they find themselves facing a shared precarious dimension[6]. An example of this process can be found in some of the ethnographies recently published in the journal *Antropologia Pubblica* (Marabello, Riccio, 2020; Bosis, 2020; Giuffrè, Marchetti, 2020; Vietti, 2020): an apartment building in the Porta Palazzo neighborhood in the city of Turin and its the communal yard as a place where «occasional tentions take place, sharing experiences and confrontations on the meanings of living together and the ways of imagining the future of the building and od the neighborhood» (Marabello, Riccio, 2020: 28) or the experimental hospitality projects explored by Giuffrè, Marchetti and Bosis, where young Italians and refugees or non-accompanied minor foreigners share domestic spaces through a collaborative dwelling modality. These experiences take advantage of the different dimensions characterizing the cohousing practice, such as a shared design process, consensual decisional processes and autonomous management, in order to increase the social capital of the community (Ruiu, 2016) by generating belonging conviviality sense.

On the other end, cohousing is often called into the question when thinking about the green transition and sustainable ways to imagine our daily dwelling practices. As a "cooler" relative of ecovillages and a distant one of the 70ies hippies communes, cohousing appears as a much better alternative when compared with more conventional dwelling forms: it is possible to design its physical attributes taking into consideration sustainable architectural and engineering models while the sharing-oriented attributes of the group of inhabitants can greatly contribute to the reduction of the overall ecological impact of the community (Hagbert et al., 2020; Tummers, 2017; Vestbro, 2010; Lockyer, 2017).

3. What's to be sustained? Precarious meanings and transitional communities.

However, cohousing is not always the answer to these issues. Indeed, sometimes it can rather be constitutive of the issues itself. As affirmed by Tummers e MacGregor (2019), on this matter it is crucial to go b*eyond wishful thinking* as optimism regarding this tool can be dissipated by a variety of critical reflections. On the «complex and situated intersections of power, privilege and difference in co-housing projects»[7], whose example can be the research carried on by Jakobsen and Larsen (2019) on a danish cohousing, where the analysis of the socio-economic composition of the resident population shows that «residents in Danish intergenerational cohousing are socio-economically and educationally privileged,

[5] «a social pattern in which different metropolitan groups dwell in close proximity, but where their racial, linguistic and religious particularities do not – as the logic of ethnic absolutism suggests they must – add up to discontinuities of experience or insuperable problems of communication» (Gilroy, 2006: 40)

[6] «We did find that migrants and non-migrants sought support, solace, and a sense of commonality with certain neighbors who lived close by. Most of our migrant respondents found themselves initially in dilapidated rental housing near the city center, in areas where some of the buildings had been constructed to house workers, immigrant and nonimmigrant, during Manchester's long, slow industrial decline in the first half of the twentieth century.» (Caglar, Glick-Schiller; 2018: 132)

[7] «The challenge for research, however, is that it is difficult to observe ongoing processes of negotiation in a collective dwelling, as they touch on sensitive issues and intimate spheres. Evaluating the impacts of negotiated collectivization on interpersonal relations, norms and values is uncharted territory for social science. It would require longitudinal, ethnographic research that asks questions about, and seeks to interpret, the complex and situated intersections of power, privilege and difference in co-housing projects.» (Tummers, MacGregor, 2019: 77)

and that the increasing multi-cultural character of the wider society is yet to reach these communities.» (p.427). On this point is built one of the biggest critiques to the employment of the cohousing practice: namely, its contribution to processes of *displacement/emplacement* of marginalized subjectivities, especially in the case of it being supported by local or national institutions as a legitimizing tool – through buzzwords such as *smart cities, green/social sustainability* (Zinzani, Proto, 2020: 48) – for large scale urban restructuring processes. This kind of critique, moving from a post-political theoretical background, expands as well to the whole concept of sustainability when the question arises: *what is to be sustained here?* (Marcuse, 1998**;** Davidson, 2010: 887). A question that calls to the directions that the transitions are following, which is to say, calls us back to a political dimension.

Nevertheless, what interests us here is to understand if and how these kind of processes take form, something that will be done through the ethnographic *case-study* of the institutionally led cohousing "Salus Space" (*Figure 1, 3*), situated in the Bologna's expanding periurban area *Fossolo - Due Madonne* (*Figure 2*). The idea of Salus Space was born in 2016, when the project «S.A.L.U.S. W SPACE (Villa Salus as a new Sustainable Accessible Livable Usable Social space for intercultural Wellbeing, Welfare and Welcoming in the metropolitan City of Bologna)»[8] is awarded as one of the winners of the EU call for the program UIA (Urban Innovative Actions), whose main goal is to «to test new and unproven solutions to address urban challenges»[9]. The project regenerated an abandoned urban area occupied by what used to be a private health clinic called *Villa Salus* by building in its place a multifunctional space consisting of 20 apartments, art and handcraft labs, a theater, a study center with coworking spaces, vegetable growing areas and a restaurant. The specific goals addressed by the project are, as stated in the UIA dedicated webpage: «1. to overcome the emergency approach in the refugees reception model and find new sustainable solutions, integrated into the social and economic framework; 2. to prevent the conflicts and the perception of migrants and refugees as an economic and social burden; 3. to fight the urban and social decay, caused by the economic crisis; 4. to foster an open intercultural society, based on the generative welfare model and solidarity, by enhancing reciprocity between refugees and citizens and knowledge contamination; 5. to deal with the demographic changes: aging population, low birth rate, migration of young people.»[10]

Salus Space thus can be inscribed amongst the already mentioned institutional responses to the ongoing transitional times and their local impact on the urban context. Indeed, the data presented in the *Programma Obiettivo*[11] 2021-2023 of Bologna Municipality shows the neighborhood Savena (where Salus Space is located) as object of a multitude of urban and social regenerative interventions, amongst which Salus Space stands out, on top of the list

[8]«ACLI Bologna, Antoniano Onlus, Aquaponic Design Associazione di Promozione Sociale costituita come spinoff del Dipartimento di Scienze e Tecnologie Agro-alimentari (Distal), ASP Città di Bologna, Cooperativa Sociale Cidas, Associazione Cantieri Meticci, CEFAL Emilia Romagna Società Cooperativa, CIOFS FP Emilia Romagna, CSAPSA Cooperativa, Eta Beta Cooperativa Sociale Onlus, ICIE Istituto Cooperativo per l'Innovazione Società, IRS Istituto per la ricerca sociale, Microfinanza Srl, Associazione Mondo Donna Onlus, Open Group Cooperativa Sociale Onlus, Società Dolce coop, Università di Bologna – DAMSLab.» SCHEMA DI ACCORDO PER LA GESTIONE COLLABORATIVA DEL COMPLESSO SALUS SPACE; Available at https://saluspace.eu/old/documenti.html (last access 07/01/2023)

[9] https://uia-initiative.eu/en/about-us/what-urban-innovative-actions (last access 07/01/2023)

[10] https://uia-initiative.eu/en/uia-cities/bologna (last access 07/01/2023)

[11] available at http://www.comune.bologna.it/media/files/p.o._2021_2023.pdf (last access 07/01/2023)

of "relevant area transformations in the triennium 2021-2023".

The actors of this project, the inhabitants of Salus Space, are today fifty-six people, selected through social mixing, sustainability and motivational criteria, in line with the goal of creating a «mixed community, with a variety of age, origins and social status» [12]. This community is based, as its common in cohousing projects, on shared agreements between the inhabitants, the Chart of Values (*Carta dei Valori*) and the Rules of collaborative co-living (*Regole della Convivenza Collaborativa*)[13]; these documents highlight how Salus Space has not been thought just as housing but more as a place to develop a lifestyle made of relations and participation: between the inhabitants of Salus Space, of its neighborhood and whoever desires to interact with the project.

Overall the project's goals (refugees/migrants inclusivity, responding to demographic changes, fighting urban/social decay, etc.) well inscribe themselves among the ongoing eco-political transitions we're all experiencing; in shaping this research I therefore began by asking what were the experiences of the participant to this kind of project (in this case, the current inhabitants of the cohousing), what kind of issues – if any – emerged during the development of the project and how were they addressed. I used Guattarian notion of ecology in order to structure the beginning of my conversations around the Salus Space: through the *ecology of subjectivity* I explored the more heavily subject-mediated aspects of the experience, through the *social ecology* I observed the entanglements between subjectivizing components and desires, or collective narratives, and in the end, in the mostly used sense of *environmental ecology* I thought-with the cohousing inhabitants about the "eco-sustainability" goals of the Salus Space.

In this section let's then look at the details of the transitional processes that constitute the Salus Space case and the many re-negotiations to which different kind of boundaries are subject: the boundaries of the city (challenged by the changing relational dimensions between the city and its surroundings), those between the cohousing and the neighborhood, the private and the common areas, the subjects and the community. As already mentioned, such boundaries can then be contextualized following the concept of ecology as intended by Guattari (2000 [1989]): an ecology of subjectivity (1), linked to the precarious inter-subjects relations generated by the *fluidity of modernity* (Bauman, 2011[2000]) and at the same time influenced by the ontological anchoring (Bosis, 2020: 79) provided by the *locus oikos* which is seen a conglomerate of practices but also as «creation and process, emotionally connotated, of meaning attribution» (ibid.); a social ecology (2), impacted by the special precarity of migration phenomena which materialize locally through *displacement/emplacement* processes that characterize the neoliberal living restructuring[14], to which cohousing projects can sometimes contribute or, other times, oppose - by becoming a tool giving rise to *sociabilities of emplacement* (Caglar, Glick-Schiller; 2018: 124); and, finally, the environmental ecology, that takes in consideration those complex assemblages of (peri)urban inhabitants *more-than-human;*

[12] From the doc. "Libro Salus Space", available at: https://saluspace.eu/old/documenti.html (last access 07/01/2023)

[13] both available at https://saluspace.eu/old/documenti.html (last access 07/01/2023)

[14] Caglar and Glick-Schiller, building on Harvey, identify the nexus between capitalism and *displacement* in the *dispossession* process: «accumulation through dispossession is justified by the categorization of those who have generated value as less than human.» (Caglar, Glick-Schiller; 2018: 17-19)

more-than-animal; more-than-plant and so on (Hinchliffe, Whatmore, 2006: 128).

Concerning those aspects closer to the sphere of the ecology of subjectivity, from my encounters on the field with the people involved in the project, emerged a generally positive attitude toward the efficacy of the latter in counteract the more material components of housing and – in a much limited way – of relational precarity, especially when comparing the experience with more conventional dwelling practices. More diffractive dynamics emerged on the point of relational precarity: between the imaginaries of the involved subjects and the material conditions of a not-born-yet community, or - in other words - between the expectations of many people regarding the project and what the actual experience has been. Diffractions that bring us to the social dimension of Salus Space's ecology, which has become more and more relevant during my fieldwork due to two main reasons: the intrinsic relevance of the social aspect to this specific form of dwelling and the strong interest that the inhabitants of the cohousing showed in regards of this issue. Indeed, through our shared reflections new spaces to think about the meanings of community and conviviality emerged; a polyphonic thinking pattern led them to the exploration of needs, emotions, and sensibilities karstically entangled: the main troubles for the inhabitants were linked to the participation and inclusion, to the community and objectives definitions, which prompted me to identify two main processes that today characterize the cohousing Salus Space under this social perspective. The first one is the presence of individualistic behaviors which suggests the absence of strong communal intentionality (that generally characterizes the cohousing arrangements, following its given definitions) and the lack of efficacy of the top-down community-assistance interventions – probably a consequence of the process described by Scheller and Thörn (2018: 930) as the subsumption of ecological/social objectives under the economical ones.

On the last note, I turn to the environmental dimension of ecology, as I attempted to think-with the non-human actors that inhabit the Salus Space. What emerged from the interviews in most cases confirms an oppositional view between urban, anthropic spaces and non-urban ones, the latter being usually associated to calm and wellness expressions. On the other hand, when taking into consideration the goals of the Salus Space project, more specifically the environmental sustainability one, we can state that this is mainly carried on, more then by a proper sensibility acquired through a collective process, thanks to the material structure of spaces, buildings and tools they're provided with – since they physically stimulate more sustainable dwelling practices. Again, we can notice how in the institutionally led cohousing social and ecological sustainability goals become entangled: if one of them goes in the background (due to the prioritization of economic sustainability/affordability), the other follows as well; indeed, even though it is true that the physical components design of the cohousing can have a great impact in terms of environmental sustainability, the main component of that impact is exactly the social/communitarian one (Hagbert, 2019; Tummers, 2017; Chatterton, 2013). Without it, it's easy to fall into the palliative cures constituted by individual practices.

4. Conclusion: empty signifiers and the boundaries of sustainability

In this short paper we attempted, on one hand to collocate the practice of cohousing in the contemporary landscape highlighting its main features in relation to the transitional/precarious times we live in, on the other hand we followed the routes pointed out by the people who experienced first-hand inhabiting a cohousing. The various points emerged from the interrogation of this research object revolve around a pivotal one:

I am referring to the application of the dynamics of urban renewal as defined by the already cited post political studies (Zinzani, Proto; 2020) and, more specifically, to the effect of "meaning emptying" (Davidson, 2010) that such dynamics have on the lived experience of projects such as the Salus Space. Indeed, through the process of entanglements-exploration, a main *fil-rouge* emerged, and it was the already cited concept of sustainability, with all the consequences that it brings with itself. I could see how, by

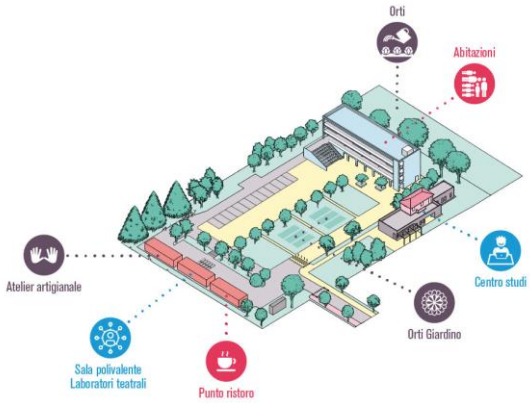

Figure 1. The Salus Space complex, from the document Libro Salus Space

functioning like what Davidson (2010) calls *empty signifier*, this term – like the other ones that accompany it in the project language – did not support a univocal meaning, thus risking to hide the perspective of the economic sustainability prerogative. Such emptying of meaning – reminding us of Baudrillard *simulacrum* in a sense – in projects like the Salus Space might end up promoting the very sense of precarity the project theoretically should be the antidote to: a mirroring game, a vicious cycle between semiotic an onto/socio/ecological precarity.

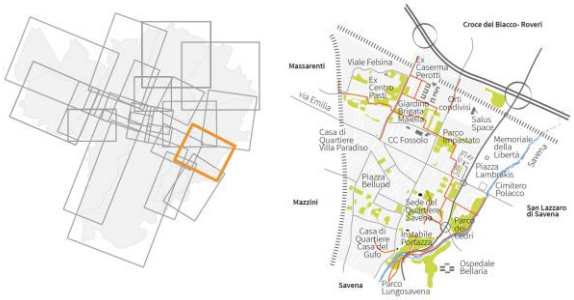

Figure 2. The urban area "Fossolo - Due Madonne – Mazzini – Pontevecchio" (Piano Urbanistico Generale 2021)

Figure 3. Salus Space: central court and main apartment building. Picture by the author, 10/05/2022.

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A transition into a migrant's memory of their escape path to Portugal: Practicing geo-architecture for the representation of a Syrian student migration

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ABSTRACT

During the rise of the Arab Spring, many Syrian individuals started looking for social justice and answers in consideration to where they position themselves as human beings. Only after the situation has triggered many to speak up, a rupture has risen but led to the delaying of dreams, the dispersal of families, the loss of homes, and the ceasing of lives. Following, the Syrian migration crisis began to abruptly augment and spread to displace people into Syria's so-called "safe-zones" to neighbouring countries and furthermore. Since the start of the crisis in early 2011, many Syrian students have had their studies disrupted, halted, abandoned, or even altogether stopped. Many Syrian students among the escaping migratory population attempted to risk their lives and leave everything behind in the hopes of a better, more stable, life and to probably start or continue their studies, to reach Europe causing a large migration crisis. As a rapid humanitarian response to this student conflict, in 2013, a Portuguese based humanitarian organization founded by Jorge Sampaio, a former Portuguese president, had launched an emergency call for academic scholarships through Global Platform for Syrian Students directly focusing on Syrian students specifically who had, at that time, difficulties to start or continue their studies in higher education. Later in 2021, the scholarship has published a collection of memoirs of these student migrants textually representing their narratives.

But for these migrations to be represented not only textually but also visually, this paper presents an interdisciplinary approach to the subject of migration in architecture. It is part of the practical work of a doctoral thesis on Syrian student migrations to Portugal from 2014 to 2018. The practical work becomes an experimentation process of theory conditioned and adapted by an expression of lines and dislocated studies of a migratory context. Thereby, the structure of the paper is divided into two parts of theory and practice. The first places the Syrian student migration to Portugal in perspective, and then it articulates geo-architecture theory within interdisciplinary approaches to migration and/or the Mediterranean. The second takes theory into practice by expressing one Syrian student's migration of a male student refugee through a path representation exercise, which goes back and forth with an interchange of theories about lines and pathways. Being a case study of a refugee migration, the work suggests three subthemes; migration-lines, where the path is drawn and studied, no-man's-land of a conterminous context, where the threshold entry ports are recognized and realized within the path, and Inflatable boat of a sea context, where the transportation method is articulated as part of the itinerary's dominant mobility. From Le Corbusier's visual expansion of scale through geo-architecture to Ingold's study of lines, the path becomes an object that frames the structure of the migratory context. Subjects such as memory obliteration and recollection, other's experience and sense of time-space, and map distortions become base-lines for the transition of the migrant's memory into path representation as a course of the migrant's body. As a result, the paper develops a form of representation that is concerned with the agency of mapping that of Corner (1999). From performing the dialogue to describing what the migrant as an interlocutor induces and what the author as a dialogist consequently engenders onto the migratory context and its depiction, an inter-subjectivity is established. This inter-subjectivity is a reading of the shared story and in-process observation, realization, and

interpretation of the migratory path through representation. It is interpreted as a concoction in the process of how the migrant affects and shapes their (immediate) environment, how their environment affects and shapes them and their event-memory, their recalling of the path, and how this relation, taken as a whole, affects perceiving and shaping the migratory experience within representation.

KEYWORDS
Syrian migration, *memory transition, geo-architecture, representation, agency of mapping*

1. A story-telling: by a Syrian migrant about a migratory escape

I start writing this paper with a brief explanation to why I am researching on this subject and why it matters to me. I am a Syrian student migrant doing my doctoral research in the interdisciplinary field of architecture with the focus on the representation of Syrian student migrations to Portugal. The stories and narratives that I am recording during the dialogs are those of persons whom I have personally and previously encountered and that their stories are as unique as their experiences. The efforts made to recall the migratory itinerary varied according to many implications that had conditioned the migrants' states of remembering, or in other words re-membering as to re-putting pieces together, to share specific moments and to obliterate others. In all, what had affected them afterwards until the time of the dialogue and during it is becoming grasped within an approach to represent and map their stories using oral history, inter-subjectivity, ethical reasoning and responsibility as basic and crucial methods of this research. This includes questioning my positionality as an author and as a migrant that also has a story to tell but at the same time is story-telling others' and reinterpreting these bodies of complex contents of reality and fiction in representation. Here, architecture becomes malleable and acknowledges a course in adapting the theme of migration by the use of architectural methodologies that will later be discussed in the paper. And thus, this becoming recognizes the many aspects a migratory story could represent, which could be associated to the field of architecture, as a deconstruction of the migration path. In other words, what information a migrant's memory provides has a significance in transitioning punctual elements of their story to constitute a narrative. This memory transition is directly connected to re-membering the transition between spaces, legally or illegally within borders, in the inevitable relation with time (date, suspension, and escalation), then with the change of velocity, weather, nature, and the surrounding environment(s). The transition of temporal and spatial experiences is affected by the obliteration and recollection of the memory and that, as a result, affects the representation of that in cross-scale.

When mentioning cross-scale in architecture, geography becomes interconnected. Le Corbusier in 1943, briefly introduced the term "Geo-architecture" into architecture in his literary work *L'urbanisme des trois établissements humains* (1943)[1]. Le Corbusier suggested "to practice geo-architecture" when reconsidering land use for experimenting with the concept of territory and aesthetic possibilities. In this treatise, he has often used the word geography, especially to describe maps, expressing extraterritoriality that goes beyond the confines of a territory. His objective in the introduction of architecture in correlation with geography was to expand the study process of an architectural setting through its expansion of scale and notion of the human geography, for the order and production of space in the world. In this sense, geo-architecture, according to Le Corbusier and to what migration as a theme in architecture

may bring about to the field, becomes an intermediary scale and method that addresses the migrant, the dialogue, the recorded material from the dialogue, and the migratory path in relation to theory and practice that condition and become conditioned by this process.

As, the case study that is being developed in this paper is of a male student refugee, my positionality as a female student migrant shifts to consider: how as I have not experienced a refugee migration myself could narrate, represent, and map one from merely a dialogic performance and encounter with the other, on one hand, and on the other, how there are differences in Syria during the war between genders within Syrian border restrictions and my limitation in declaring these differences. To put my words and worries in theory, Lynn Abrams in "Oral History Theory" (2010) describes this relation with the other during the making of oral history as an intersubjective relation. Oral history is the mutable naturally-undergoing-product of inter-subjectivity between the interviewer and the interviewee (Abrams, 2010, p. 24). But here I prefer the use of the "dialogist" and the "interlocutor", for it is the act of dialoguing with the other and interpreting their words and reactions during the dialogue rather than merely interviewing them. Saying this, this mutability of intersubjectivity suggests that one cannot omit the other's presence in the writing of oral history, in the recording of their narrated (remembered) story, nor can one omit oneself from being within the process as one is the reinterpretation's mediator of that story.

How much reality is in fiction is an undetermined factor in the writing of oral history and in the representation with intersubjectivity. This unknown level of accuracy and fallibility in one's memory and in the reinterpretation variates according to the trauma the other holds from the act of remembering and from how draining this act is to that other (Abrams, 2020, p. 93). Because the case of the Syrian war-conflict is an extremely and politically sensitive subject in which to be involved, I choose to not explore the Syrian border restrictions made regarding Syrian citizens. Firstly, as the restrictions are ever-changing and complex. And secondly, if these restrictions may or may not interfere in the migration, they are not shared during the dialogue with the case study of the student refugee. But the process of reinterpretation of the story explores through the path's suspension and/or escalation these interferences. It is about the inevitable relation between time and space and its impact on re-reading the individual war-experiences in Syria that drove many to escape.

The Syrian migration crisis began after the complication of livelihoods and day-to-day difficulties that Syrian individuals have been confronting since the start of the war-conflict in 2011. The loss of home and the continuous but traumatic loop of events forced many Syrian individuals to take the risk of escaping. In the search for a better, present and future life, many of these individuals crossed the Mediterranean region and sea to reach a place far away from war and its complications. From land to sea and from sea to another land, the escapees are transported to different unfamiliar stops and ports to initiate their flee to a safe place. Many traverse the sea by boat after being illegally smuggled out – some of those were able to survive and others took their last breaths under water. Alzakout and Abdulwahed's "Purple Sea" (2020) depicts actual scenes taken in a flee attempt in the coast of Lesbos, though the overlapped narrative takes place on the land a certain period after the arrival to Europe. The narrative in "Purple Sea" also expresses emotions felt during the sinking of the boat and memories recalled and experienced in Syria. In this concoction of emotions and memories, the narrator that is also the photographer and director of the documentary gave the spectator the whole

image of the migration attempt, its causes and effects, while focusing on the peak and changing point of the migration that is the capsizing of the boat and the escapees and their call for help to continue their path.

2. The path: of a student refugee migratory escape

The practical part of this paper is based on the representation of the student refugee migratory path using the "Agency of Mapping" (1999) of Corner as a research method that transforms the conventionality of map-making and mapping into counter-mapping. With it, Corner establishes an agency in the act of mapping that concerns the progressing capacity of representation in revealing, recognizing, and realizing a context projected from an eidetic imagination and memory to a speculation and relation connection — abstraction of ideas, images and text— evoked by the author's documentation (of reality) of the subject's context. Cross-scale relationships in time and space are created through mapping as an agency, a system of "unfolding potentials" (Corner, 1999, p. 10). In "Lines: A Brief History" (2007) and "The Life of Lines" (2015) Ingold's study about the line and line-making with its connections and correspondences to the world cross-path with Corner's look to the potential of expression and representation in mapping. Ingold, through the definition of particular words and the expression of this action into drawing lines in various shapes, relates back to the relation of the world with the human involvement and experience in it in "Lines: A Brief History" (2007).

In figure 1, the time-line of the student refugee migratory path, a word in informal Syrian Arabic is placed within the migratory event, that is: Tamsahet تمسحت (tamsah'na first-person plural form تمسحنا ; third-person singular tasmsah (m.) تمسح | tamsahet (f.) تمسحت) used multiply by various student migrants during the dialogs, also used to describe the civilian status of a Syrian individual inside and outside the homeland. Syrian Arabic; untranslatable word into English; first person singular past tense verb; metaphoric meaning used to transform the noun crocodile تمساح (temsah), more of the toughness of a crocodile, into a verb to signify the numbness, normalization, and familiarity in a negative sense but also the tolerance of a person getting used to a specific situation with hardship(s)." How to translate this word into lines and how these lines are affected by this feeling of *tamsahet* starts by its inclusion as an important emotional state of the migrant during the migratory path and the dialogue. Although the word *tamsahet* only appears midst the first escape attempt in the time-line (figure 1), yet, it lingers during the whole venture as a self-soothing and goal-focused method to look forward and remind oneself that what is left behind no longer matters. When recalling the event, the refugee migrant was asked if the act of remembering brings up disturbing feelings or sadness. His answer was mentioning the word *tamsahet*, as also his current state during the dialogue. According to him, what he went through though remains quite vivid in his memory, yet he is not overly traumatized by it, as it is a page from the past. This state, *Tamsahet*, may or may not have affected his re-calling of the event and his personal sense of time and space, which will be discussed along this paper through the time-line. Though the time-line's duration is three years, his migration journey took two years after one year of the first large flow of Syrian student migrations occurred in 2014. This student migration case study is the case of a male refugee that has never went out of Syria before this migratory event of his has taken place and time.

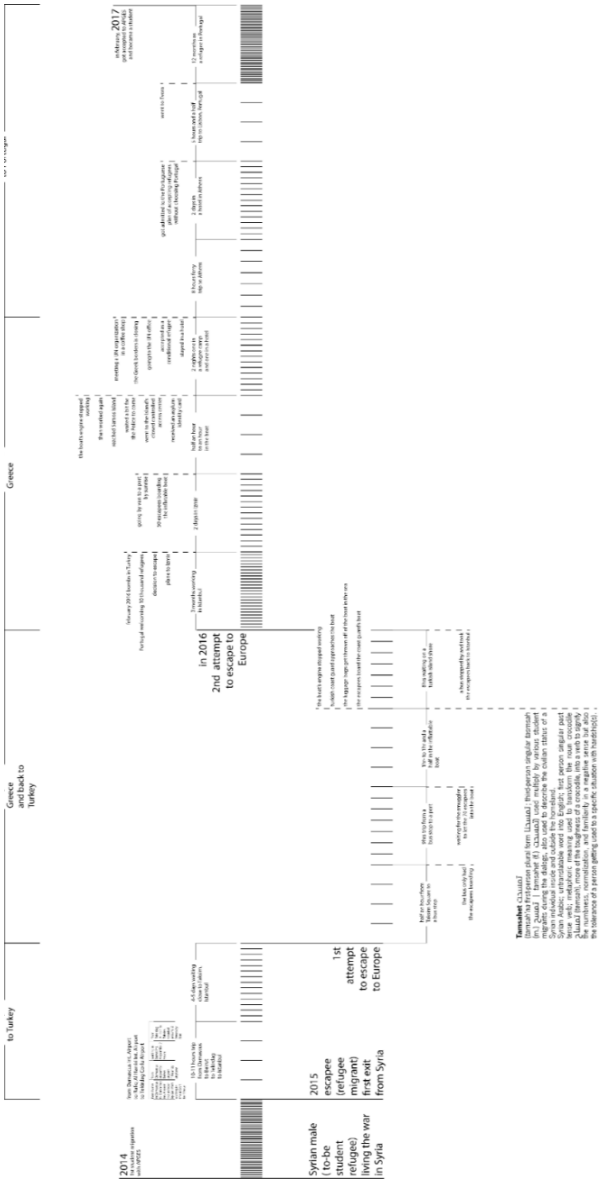

Figure 1. Time-line with shrinking and dilating of time intervals of events for a Syrian student refugee from 2014 to 2017. Sarah Shrbaji. 2022.

I met this student in 2017, and at that point he had freshly entered the scholarship of Global Platform for Syrian Students. He had obtained and held a refugee status prior to entering the scholarship, and then after, he became a student refugee. The time-line (figure 1) describes how his status as a migrant changed from being a person without labels but living in a war-conflicted zone to a person where the labels define where he enters, how he transitions, and what he crosses. From the start of his migratory escape from Syria, he had no plan to where he was going after arriving to Istanbul, Turkey in 2015. But all that he fully wanted was to leave the Middle-East and flee to Europe. Few days had passed after he was able to find a smuggler that provides different transportation methods to escape by the sea to a Greek Island. The escapee (to-be a student refugee) chose the most reasonable one to him; it was the inflatable boat, which costed him 1,500 dollars, in comparison to the other options that were: jet-ski for 500 dollars, motorboat for 2500 dollars, and yacht for 3500 dollars.

The shift from the time-line to the representation of the time intervals brings about three sub-themes: migration-lines, where the path is drawn and studied, no-man's-land of a conterminous context, where the threshold entry ports are recognized and realized within the path, and Inflatable boat of a sea context, where the transportation method is articulated as part of the itinerary's dominant mobility. Before arriving to this point of embarking on the inflatable-boat, the escapee had to catch a bus that transports him to the port. In both of his attempts the escapee was not familiar to the surrounding nature and environment, as he never went out of Syria before. By not recognizing the location of things and places, he started mentioning the 'maybes' and using the duration of time. This mentioning and repetition of this word-choice, became a way to build hypotheses and speculate place and movement while calculating distance according to time. His movement depending on the time duration that was given and the bus stops and ports that could be possible points of departure and arrival came to be the 'maybes'. The maybes became connected, the maybe bus stops with-to the maybe ports, but all had this duration of around four to six hours trip with approximately 400 km in distance. Yet according to him, that path from the maybe bus stop to the maybe port is a nine hours trip with no stop. His nine hours trip in a bus consisted of, after catching the bus from a bus stop half an hour away from

Taksim Square to a port was a mere personal sense of time, as the nine hours' path extremely stretched far to the east of Turkey and became too distant to reach a port near the destination of the first attempt to Mytilene, Greece. Thereby the maybes became a four to six hours trip, representing both possibilities as part of this migrant narrative's representation and the analysis taken upon understanding the level of fiction behind the path taken as in (figure 2) and the upcoming thresholds, the entry ports of the sea between the two lands that the escapee will traverse. The map that expresses the migratory narrative is distorted as in geophysical appearance and in geographical location to translate the uncertainty of location of places and personal sense of timespace.

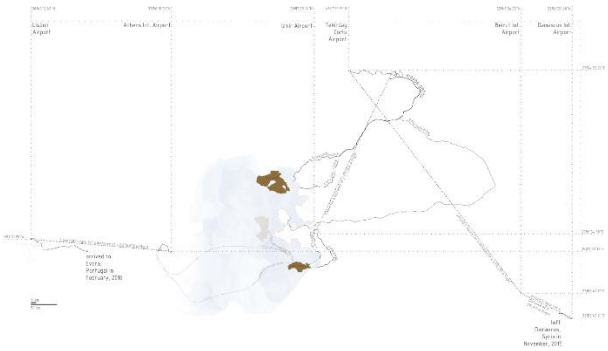

Figure 2. Distorted map of a refugee migratory escape from Syria to Portugal connecting the maybes. Sarah Shrbaji. 2022.

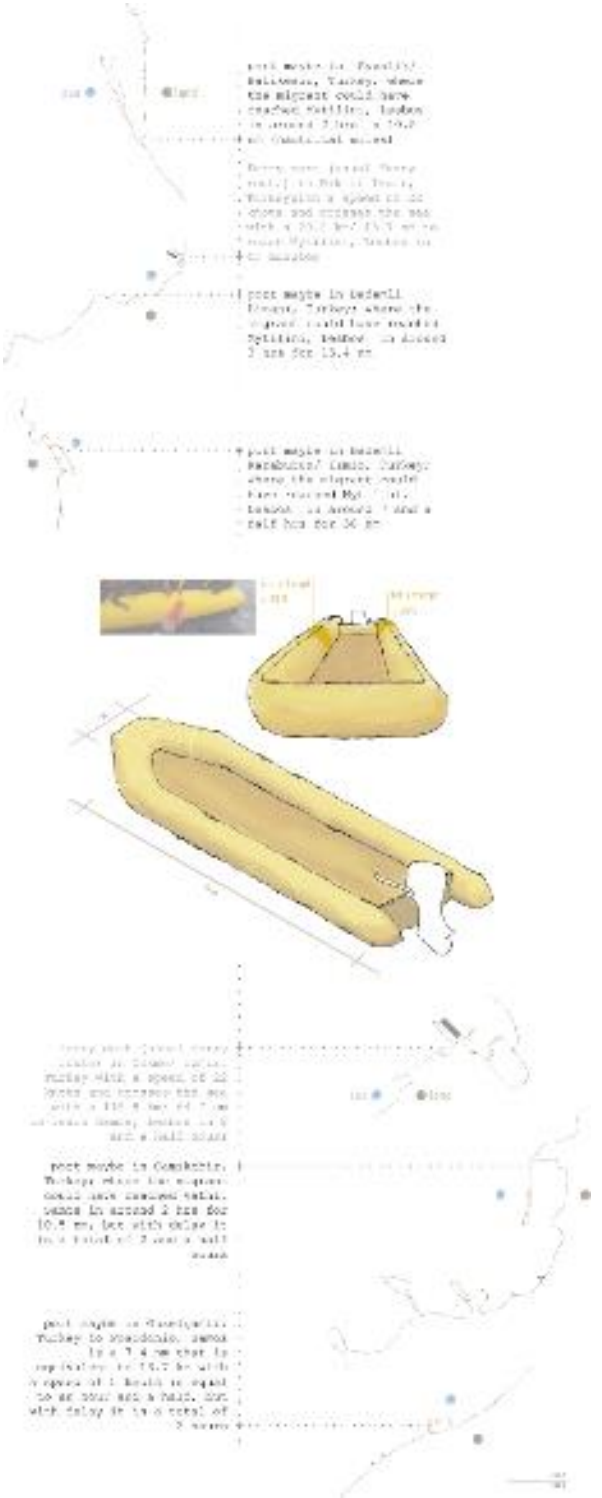

Figure 3. Diagram of the maybes with the what ifs and a montage of the yellow inflatable boat showing where the student refugee had sat during his two attempts to flee to Europe and the dimension of the inflatable boat. Sarah Shrbaji. 2022.

After arriving to the port maybes on both of the escapee's attempts, the long but narrow yellow inflatable boat was waiting for him and

the other escapees, 70 persons in the first attempt and 50 in the second for a boat that is supposedly made to fit 40 persons maximum, to embark it. It went with a speed of 5 knots on both escape attempts. With nine meters in length and two meters in width, the yellow inflatable boat was partially aground and partially lodging on land. In both attempts the sky was relatively cloudy and the sea water of the Aegean Sea of the Mediterranean was calm with few breezes and unnoticeable waves coming every now and then as it was a calm autumn and winter in 2015-2016.

The first escape attempt was supposed to be to Mytilene, the capital of the island Lesbos in Greece. A volunteer from the escapees was put to navigate the inflatable boat. But it was a unsuccessful effort as the inflatable boat turned into circles until water had entered the boat's floor from its edges. So the escapee (the student refugee) took responsibility to pilot and navigate the inflatable boat, though he had never done this before, and switched seats to sit next to the motor engine. But the attempt had failed as the engine broke down and as the boat started to partially sink. Many escapees began yelling and all became distressed. Meanwhile the Turkish Coast Guard approached the inflatable boat and threw the escapees' luggage bags in the sea and forced on-board the escapees. This escape attempt in the sea took a total of an hour and a half, yet it seemed much more, passing through all three stages as seen in (figure 4). Then afterwards, he was left on shore with the other escapees 'luggage-less', waiting for eight hours to catch a bus that took them back to Istanbul. In the first attempt the maybes provoke the what ifs that are also part of the hypotheses as shown in the diagrams in (figure 3). The three what ifs express how much time and distance it would take the refugee in this inflatable boat with a speed of 5 knots to reach Mytilene.

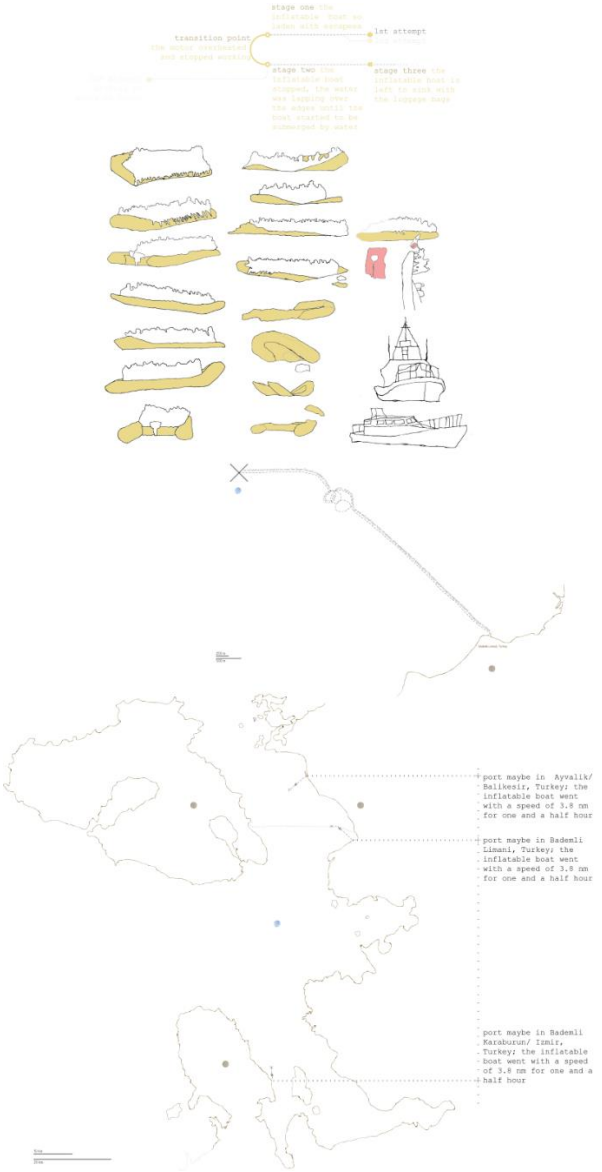

Figure 4. First escape attempt diagram for the port maybes with the three different stages of the Inflatable boat versus the coastguard in relation to the escapees. Sarah Shrbaji.2022.

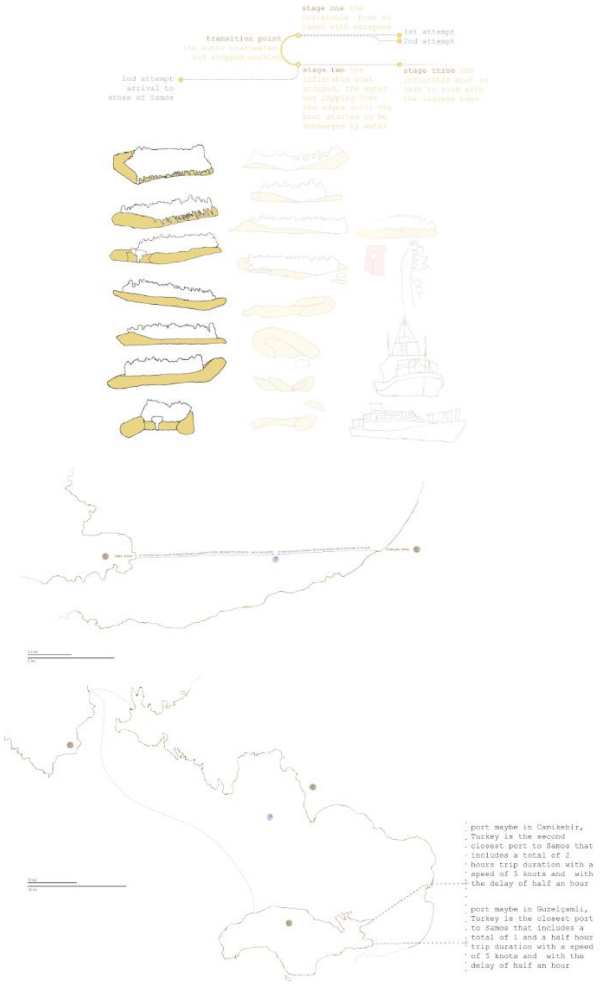

Figure 5. Second escape attempt diagram for the port maybes with

After three months have passed of this incident, in 2016 the bombing in Turkey took place. So he immediately decided to escape again, initiating his second attempt. He took a plane to Izmir and then went to a port to board the boat, this time the trip was a success, though the engine broke as well but luckily worked again, passing through one stage as seen in (figure 5). With 20 persons less this time, he reached Samos Island of Greece. On arrival to the shore, the local police came to take them to the Island's Civil Registry Centre, where they were relocated in a temporary camp. The escapee just stayed one night, as he got accepted in a UN refugee program and then was taken to Athens, Greece by a ferry. In Athens he got selected to be part of the Portuguese plan that welcomed, at that time, 10,000 refugees to its land. After 12 months of arriving to Portugal he got accepted and admitted into the scholarship of Global Platform for Syrian Students and became a student.

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Image references:

Fig 3 (photo-still of the inflatable boat on the top left). Sea-watch crew [Online video]. (2021). https://twitter.com/seawatchcrew/status/1366420397919514624?s=20&t=VRZMUlAqnGDR9Pafqlie1Q

Track 3 | BUILDINGS

Many changes have taken place in recent years for what concerns all levels of the building process. Aspiring towards more conscious and responsible design and construction choices, criteria that were previously overlooked have now become ever more salient (e.g., life cycle thinking, circularity, carbon neutrality, km0, low environmental impact).

How is architecture adapting to the demanding framework of transition? What are the new paradigms that are emerging in the actual transitions, and what forms can we envision for a future-proof architecture? What role do technologies and design play in this passage?

A Guideline to Conduct Circularity Assessment at Whole-Building Level. Lesson Learnt from a Case Study

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ABSTRACT

The building and construction industry is rapidly transitioning from linear to Circular Economy (CE) to reduce waste and hazardous impacts and achieve more sustainable operations. Various strategies to implement CE principles have been worked out by previous researchers, however, there is still a lack of consensus on their effectiveness. It is largely agreed upon by the researchers and construction practitioners to use CE assessment tools to manage this transition at buildings and materials levels. However, no published standards or guidelines for building circularity assessment can be found in extant literature. The experience gained working on a literature review and a case study of a residential building, suggests the following: (i) there is a need to standardize a single BCI to enhance the confidence of stakeholders; (ii) circular databases and platforms containing basic material and construction product information should be developed and made public; (iii) BIM 3D models are extensively helpful and have huge potential for automated circularity assessment in the future; (iv) existing sustainability assessment tools like Life Cycle Assessment (LCA), and LEVEL(s) can facilitate the procedure. This paper gathers and organizes the solutions found and the lessons learned while performing a circularity assessment on a real building to address the abovementioned issues and to propose a set of guidelines aimed at facilitating the implementation of Building Circularity Indicators (BCI) with reasonable accuracy. The proposed framework can be used as a support tool or reference for the designers and engineers who wish to conduct a circular assessment of any building.

KEYWORDS

Building Circularity Indicator; Circular Construction; Circular Economy; Circularity Assessment; WBCI

Introduction

Buildings are responsible for consuming a huge amount of resources and producing massive waste that is often landfilled and incinerated after the End of Life (EOL) (Bilal et al., 2020; Khadim et al., 2021). According to UNEP and IEA (2019) building industry consumes 30% of raw material, 40% of energy and 25% of water globally. This linear resource consumption pattern (Take-Make-Dispose) of the building industry puts massive pressure on depleting resources and is responsible for severe environmental impacts that contribute to climate change and global warming (Buyle et al., 2019). In response to this, the building and construction industry is transiting to Circular Economy (CE) to produce more sustainable and environmentally friendly buildings (Khadim et al., 2022b). Circular Construction (CC) based on CE principles, aims to eliminate construction waste by closing the material loops and enabling the reuse and recycling of building components through the implementation of innovative design strategies and technical advancements at the early design stage of the buildings (Cottafava & Ritzen, 2021). CC reduces the reliance on new materials and also the environmental footprints of the buildings (Abadi & Moore, 2022).

In order to transit from traditional construction to CC, several technical strategies and policies have been developed (Wuni, 2022). However, it has been observed that these strategies may not always help achieve the desired level of circularity

(Kakwani & Kalbar, 2022). Therefore, careful monitoring and evaluation of interventions and efforts made to achieve circularity, need to be done. In this regard, several Building Circularity Indicators (BCI) have been devised by industry, academia and government agencies (de Oliveira et al., 2021). BCIs are fundamental in measuring the progress of this paradigm shift and can provide a uniform language to facilitate knowledge exchange and information sharing among various stakeholders. However, it has been concluded by previous studies that BCIs are at the early stage of development and lack consensus (Çetin et al., 2022). The industry-wide implementation of BCI is still low owing to various social and technical barriers i.e. lack of data/resources, absence of universally-accepted indicators and implementation guidelines etc. (Khadim et al., 2022a).

A typical BCI requires building data (i.e., drawings, specifications, energy ratings etc.), material data (Bill of Materials (BOM), bill of quantities, recycling/reuse rates), existing databases (embodied energy, waste factor, product composition), and modelling of future scenarios (functional life, EOL waste scenarios). This kind of data is often difficult to obtain and complex to process and analyse. In order to standardize the CE assessment procedure, a comprehensive set of guiding principles is desirable and advantageous.

Similar to BCIs, Life Cycle Assessment (LCA) that calculates the environmental impacts of products, is continuously standardized through various published standards like ISO 14040, 14044 and EN 15978 (Arshad et al., 2021; Lin et al., 2022). However, no standard can be found in the literature that set rules and bars for circularity assessment in building construction.

To bridge this gap, this paper aims to propose a procedural framework to successfully conduct a circularity assessment of the buildings and construction projects. In previous works, the most widely discussed BCIs are critically reviewed (Khadim et al., 2022a) and an indicator is applied to actual building data of a residential building (Khadim et al., 2022b). During this research, various barriers and difficulties have been faced in measuring Key Performance Indicators (KPI). The solutions found to address these issues and lessons learned are gathered, organized and explained in this paper as a methodological framework for building circular assessment. As per the authors' knowledge, it is the first of its kind research in the CC context. The findings of the study can be used by stakeholders to effectively apply the BCIs to their projects in order to measure the circularity scores. Further, the findings will also help the policymakers to develop a standardised approach for conducting a circularity audit of a proposed project or existing building. A standardized approach will enable the practitioners to make a fair comparison between the circularity performance of various buildings.

Methodology

As formerly mentioned, this study is the continuation of previous works. Figure 1 presents the overall picture of the research workflow carried out so far.

Initially, a systematic literature review of 51 carefully selected documents was conducted to identify the available BCIs in academia and industry. 35 material and building level circularity indicators were categorised and critically analysed. The critical analysis helped in identifying the general attributes of indicators (Khadim et al., 2022a).

Based on these findings, a new framework called Whole-Building Circularity Indicator (WBCI) was developed. To test and validate the first version of WBCI, a case study methodology was used. A residential building situated in the Caserta district (Southern Italy) was selected as a specimen. With the help of building documentation (drawings, specifications etc.), a BIM model was constructed and required data (BOM, material quantities etc.) was extracted. The testing

helped in identifying the limitations and errors in the framework (Khadim et al., 2022b).

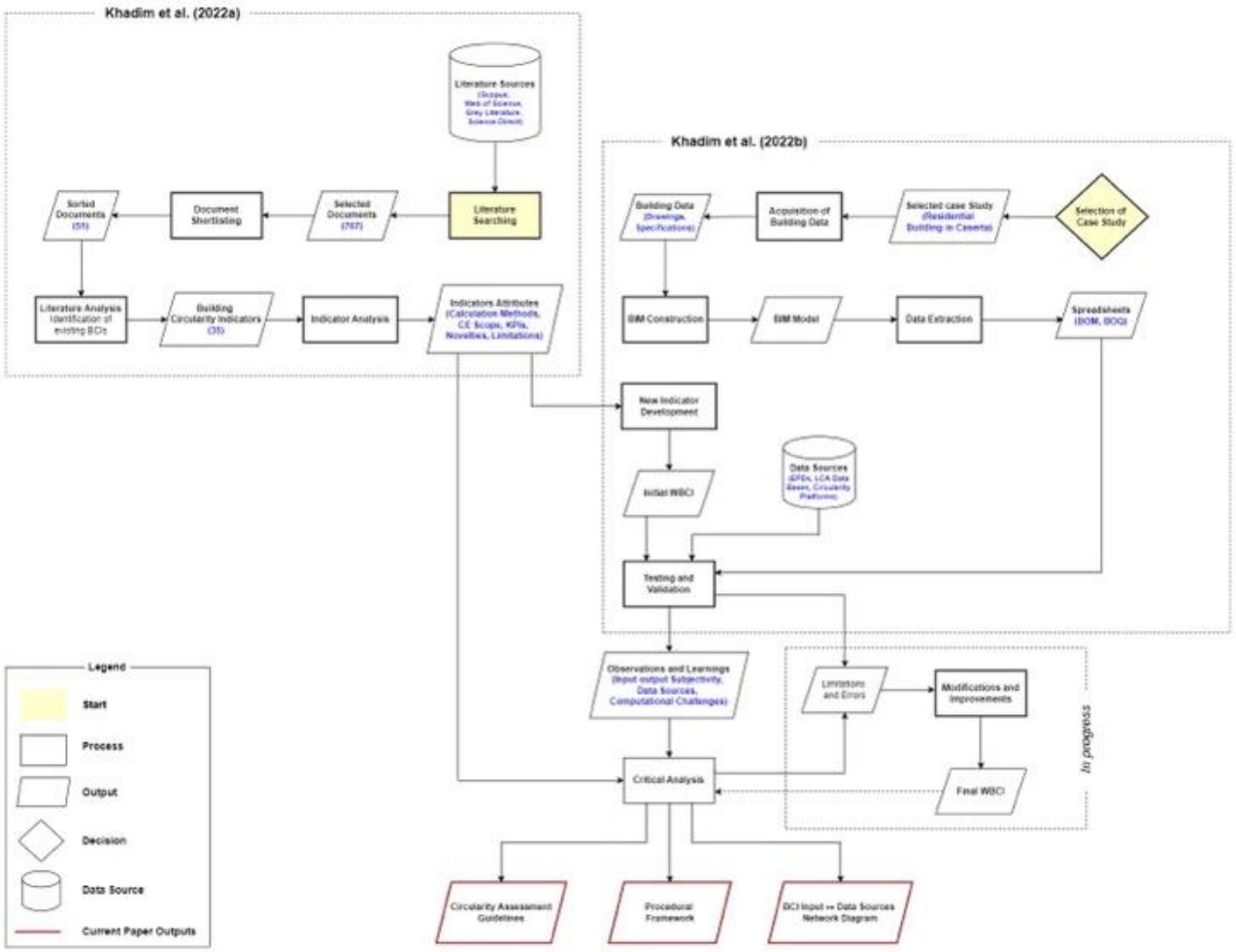

Figure 1. Flowchart of the entire research process

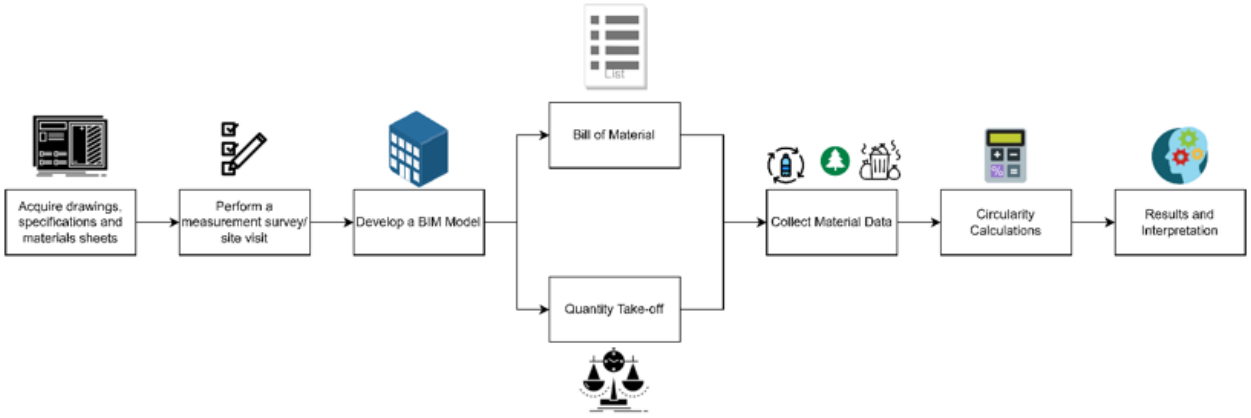

Figure 2. Circular assessment workflow diagram

The work conducted up to this point highlighted that the implementation of WBCI is a complicated process that requires comprehensive data, which is difficult to obtain. No particular standard or guideline is available in this regard. This discovered gap led to the conception of this paper, whose

main objective is developing a procedural framework for BCI implementation.

To this aim, as the first step, a 'Critical Analysis' of circularity indicators is done in order to identify the data constraints and complexities in conducting a circularity assessment. With this purpose, the previously identified 35 BCIs (Khadim et al., 2022a) are revisited from the "implementation and data requirement" perspective to find out all the inputs for every indicator. This step helps in making this guideline generic and not specific to WBCI or any particular framework.

Secondarily, the observations (i.e., computational difficulties, required assumptions, etc.) and learnings (new data sources, input/output subjectivity) gained during the case study are gathered. This helps in identifying those section of the indicators that require methodological explanation and may be complicated to calculate. For example, inputs like material wastage factor and functional lifetime are hard to predict and require certain assumptions.

Finally, the identified issues and data requirements are coupled with found analytical solutions, circular databases, and learnings to formulate the circular assessment workflow and draft guidelines. Additionally, a network diagram connecting BCI inputs with the data sources is also developed to visually presents the findings.

Results and Discussions

Based on the literature review and lessons learnt from the case study, a BCI workflow diagram has been developed to assist the process of circular assessment, as shown in Figure 2. Every step of the flow chart in Figure 2. is explained in detail in the following.

Bill of Materials

The most vital and crucial step in calculating the circularity score for a building is to develop a comprehensive BOM as it can significantly impact the accuracy and precision of the overall procedure. An incomplete BOM can result in misleading results that give rise to imprecise interpretations. BOM can be straightforward or complex depending upon the scope of assessment, available information and complexity of the building. It is an iterative process and gets matured as the assessment progress and further information becomes available. At the whole-building level, a BOM can contain hundreds or maybe thousands of materials and it can become tricky to inventory each and every element of the building. In such cases, some materials with insignificant impacts can be overlooked. The BOM is quite similar to creating a Life Cycle Inventory (LCI) in the LCA of a building. A similar sort of data is used in both procedures. However, LCI in LCA can be more detailed and backed with databases. The following procedures can help develop the BOM for BCI.

Acquire Drawings and Specifications

To develop a BOM, acquisition of building drawings, specifications and material datasheets is the most important step, as it can reduce the overall amount of work. For new buildings, this information is easily available. However, for existing buildings especially cultural heritage or older residential buildings, information like material specifications and details might be difficult to acquire or non-existent. In such cases, sources like national databases, historical data and literature reviews can be consulted. Further, the local industry average can also be used.

Information regarding components and elements of the building can be acquired from the manufacturers or through industry ratings like Environmental Product Declarations (EPDs). Depending upon the localities, local authorities may provide such information regarding various products (for example, in various countries of the European Union, EPDs are readily available on various online platforms). In their study, Heisel and Rau-Oberhuber (2020) extracted such information

from the manufacturer datasheets and used it to calculate circularity scores.

Measurement Survey

This step is more relevant to existing buildings since in the majority of such cases complete building data is not readily available or not maintained. Site visits or measurement surveys can help in identifying the materials and details which are not traceable from available data. This survey also helps in identifying those areas of the building that has been refurbished, altered or retrofitted during the long operational and use phase.

Develop a BIM Model

After collecting adequate information about the building, it is recommended to create a BIM model. A 3D BIM model can help in visualising the building digitally, making improvements and performing an accurate quantity take-off. A BIM model also gives the leverage to use the industry or organisation-developed BIM objects. BIM materials and objects usually contain useful data i.e., unit weight, embodied energy, and materials composition. BIM model also helps in automating the process. Some commercial tools like GaBi also offer to calculate Material Circularity Indicators along with LCA calculations using the BIM files (GaBi, 2022). Another LCA tool, called One Click LCA, has also designed a circularity toolkit that can use BIM and LCA data (One Click LCA, 2022).

It must be noted that developing a BIM model is an optional step as it can automate the various calculations and can expedite the procedure. However, BOM and calculations can also be done manually or with help of the other tools.

After collecting all the data, the next step is to organise the information for further calculations. In this regard, an application like Microsoft Excel can be very handy. A good hint is to use product/material coding to give a unique ID to every material. For that purpose, national coding can be used, or the user can define his system. For example, the Netherlands has coding for building materials called NL/Sbf coding (Platform CB'23, 2020). Most of the indicators use various concepts of layers to categorise the building components, for example, Verberne (2016) used Brand (1995)'s concept of shearing layers (site, structure, space plan, skin, services). Therefore, materials and components can be categorised in the defined layers at this stage. It is worth highlighting that a material can have a different circularity rating when it is used in different layers (Khadim et al. (2022b). At the initial stage, the following information must be acquired for each material.

- Name and type of material
- Unique ID/code of the material
- Quantity and units
- Shearing layer category

Material Data Collection

To apply the circularity frameworks, comprehensive material information (e.g., input feedstock, future waste scenarios, maintenance requirements, etc.) needs to be defined. This step can be tedious and may require certain assumptions. During the case study, various sources have been explored to find the relevant information and, based on that knowledge, a network diagram has been created to visually present the inputs and their possible sources, as shown in Figure 3.

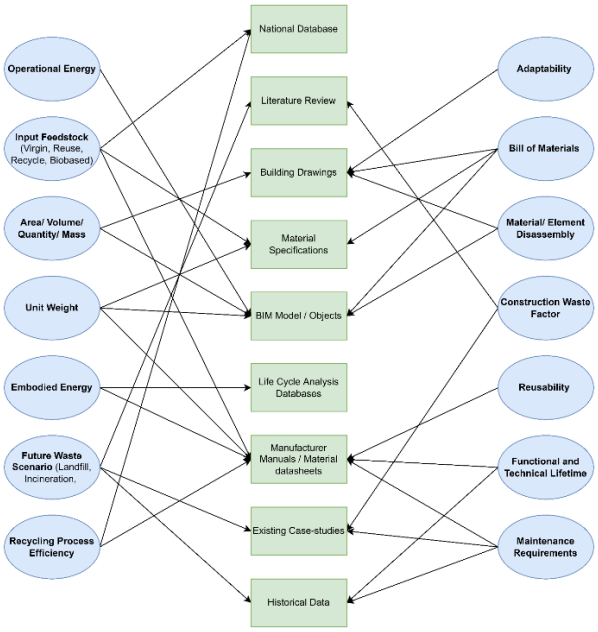

Figure 3. BCI inputs (light blue) and data sources (green)

The major and most reliable source of data for material-related information is the manufacturers. Manufacturers usually have specific and first-hand information about components, materials composition with sources (reused and recycled) and also analysis of EOL of the product. It is the best and easiest way to find relevant information. The rest of the sources, like national databases, literature, and LCA data usually use average product data which may not be as accurate as specific data provided by the manufacturer. For all the other required inputs and possible reliable sources shown in Figure 3, comments are given in the following paragraphs.

Input Feedstock: If manufacturer data is not available, material specifications or national/regional material databases can be explored. Previous case studies are also very helpful in this regard.

Area/Volume/Mass/Unit Weight: Specific unit weight should be used, especially for heavy materials (i.e., concrete and steel in the structure layer) since unit weight is used to find mass from area or volume. Mass is mostly used as a normalization factor in the majority of frameworks.

Embodied and Operational Energy: Energy values can be obtained using BIM calculations using various simulations. Embodied energy can be found in material datasheets.

Future Scenarios: Predicting the future waste scenarios can be crucial and involves certain assumptions as the values can significantly vary depending upon the location, type of material, recycling facilities and some social factors. National databases, material standards and existing case studies can help in defining these values.

Disassembly and Adaptability: These values can be obtained from drawings, building layouts and BIM models. It should be noted that some framework use component disassembly as-a-whole and others use material disassembly separately.

Construction Waste: This value mainly depends upon the construction methodology and material type. Where no specific data is provided, existing studies (e.g., Shahid et al. (2022) can be consulted for specific construction environments and locations.

Technical and Function Lifetime: Technical lifetime is usually provided by the manufacturer for various products. However, for residential buildings, a period of 60 years is typically considered. The majority of indicators use Brand's lifetime values (Brand (1995) for various layers. Functional lifetime is hard to predict as it is mainly based on user needs and satisfaction. Historical data and surveys can be used to define this value, however, in case of lack of information, this value should be taken as equal to the technical lifetime value to avoid any bias.

Maintenance and Reusability: Such information is usually available in operational manuals of the buildings and material datasheets developed by manufacturers. In absence of mentioned documents, existing

case studies and historical data should be explored.

Recycling process efficiency: This value is usually obtained from the recycling facility centres. It depends upon the technology, equipment and processes used to produce the recyclable content. It can vary from product to product and from one facility to another.

Using these recommended sources and workflow defined in Figure 2., circularity assessment of a building or a proposed design can be done with fair accuracy. Since the BCIs are still in the developing phase and adequate data streams are not available, certain careful approximations can be done as mentioned in the above paragraphs.

Conclusions and Recommendations

This paper presents a comprehensive guideline to conduct circularity assessment on a whole-building level based on the experience of a literature review and case study of an actual building. The application of the most popular BCI methods to a typical residential building in South Italy led to the conclusion that there is a lack of available accurate data streams and, to work around this problem, various strategies, data sources and calculation methodologies have been identified. All these findings are gathered to develop the methodological framework presented here. This study proposes various alternative data sources and a circular workflow process for performing a circular assessment. The findings of this study are novel since no specific standard or universally accepted framework for building circularity assessment exists in the literature. This paper can be used as a reference document for construction practitioners and project stakeholders who wish to calculate the circularity scores of their buildings or projects. The findings of this paper can act as a starting point for the development of standard practices for circular assessment in buildings and construction, similar to LCA standards. The contractor and consultant can use this information to accurately identify the areas of improvement in terms of circularity that will help achieve more sustainable construction operations.

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Envisioning Transitions
Bodies, buildings, and boundaries

Inhabited intervals between the city and the house. From transition spaces to relationship places

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ABSTRACT

Transiting through architecture is a fundamental action to read, understand and interact with the architectural elements. A good part of the authenticity and power of an architectural experience is based on the possibility of understanding a building as sensorial. In this sense, collective public housing can alter, articulate and influence the human experience. These spaces, "other" than strictly defined as domestic and private, become a branch, a collective and democratic filament, where feeling at home is possible anyway. Thus, the transition space becomes a filter, an imprecise and porous limit, a place to stop in the shade of a tree or to explore an architectural threshold.

Next door, the staircase in front, or the other side of a patio, a terrain, the water fountains, the green outdoor space or the top of a terrace, would be the base for generating a new architectonic scenario for the collective coexistence. This is not just a "way back home", but a contest of new places and pathways shared with the citizen's community. This will generate a new experience of differentially living the "transition", leading to an emphatically rethinking about belonging to a place.

The paper aims to suggest possible future strategies for collective public housing through modern post-war examples in Rome and Madrid in which, beyond the formal characteristics of the buildings, it is possible to find a human and collective dimension of living. Today, as syncopated episodes, the examples represent an exception in the urban context of the city that has grown up around them and preserve the intangible value of the places unaltered.

KEYWORDS

transition; collective housing; atmosphere; Rome; Madrid.

Introduction

Over the years, the relationship between the home and the city, between the public and the private dimension, has represented a topic of considerable interest due to its change from an architectural, urban and social point of view. This relationship is particularly interesting if understood as a space of transition and proximity between houses and as an opportunity to rethink the boundaries of domestic space also outside, in close contact with the city and the street.

Today, the recent pandemic condition has brought to attention both the space of the house, understood as an area of individual/family confinement, and understood as a series of solutions that can foster social relationships with the surrounding environment and with the rest of the community, in a scenario increasingly characterised by times and ways of life that push towards individualism. This second reading of the collective house unequivocally talks about an idea of an inclusive city in which to rediscover a sense of expanded domesticity.

In this sense, the pandemic has been a pretext in which to rediscover the importance of some places precisely because, in moments of the spatial restrictions imposed by the lockdown, the transition areas between the city and the home have undergone a contraction, transforming, even more, from physical and tangible to digital. In these conditions, we brought the public space at home, leaving the city empty. The technology, in a certain sense, has suggested different types of help, actually consolidated in daily practices (the possibility

of buying online, delivering food, streaming and video calls, workouts on TV, etc.) However, those have contributed to an individualistic system, increasing people's loneliness and entailing psychological problems already evident in this first post-pandemic phase.

Beyond the possibilities of technological connection, we must therefore think that the home is still the intersection between humans, plants, and domestic animals, among smells and perfumes, whose identity is built on communication and interaction in the daily life of different individuals rather than about their separation.[1]

Therefore, the importance of the physical and real environment can still be fundamental to determining the quality of our daily life and generating a supportive, active and participatory society.

As Aldo van Eyck already wrote, it is necessary to create an expanded frontier that organises the movement of citizens by stages, intervals and episodes, mitigating the anxiety that can cause hard transitions. The house and the city must guarantee a feeling of familiarity.[2]

Living between houses, recreating intimate relationships of coexistence between human beings and other species instead represents a form of domestic exteriority that reconnects us with the places we live, and always feeling at home. In this sense, the home is not only a well-defined physical space but also a state of mind, the result of an atmosphere and the product of a series of phenomena that link us to the city.

The in-between space's familiarity tells about our way of living, reveals habits and customs and offers an additional interpretation of the architectural project. The spatial perception of things around us generates an atmospheric experience: the architect Juhani Pallasmaa writes that an authentic architectural experience consists, for example, when approaching or confronting the volume of the building and feeling its physical presence rather than the shape of the façade. Entering or crossing the border between two areas, and not only in appreciating the visual image of the door or looking through a window, rather than in the form of the window as a unit of visual composition.[3]

This perceptive, phenomenological and physical recovery of the city between the houses passes through a city linked to the movement and passage of bodies between built spaces. In this sense, the street has represented the instrument through which we have always related to places, first linked to the human dimension of the pedestrian and then to the vehicular one. This change in infrastructural dimensional relationships, determined in particular by the use of the car and the exponential growth of the city, has progressively changed our habits and our ways of living between buildings, especially concerning the street level and the relationship with the ground. Over time, the "interesting distance" between things has been lost, expanding the dimensions and restricting the times of a city that we have learned to call “generic”.[4]

However, our Italian cities in the past have been - and continue to be in part - anything but generic. The urban spirit played a leading role in public space, which consisted of experiencing the street. The Mediterranean climate, in particular, and the favourable external atmospheric conditions amplified the possibilities of the inhabitants to leave the house, to transit and to carry out jobs and social activities, occupying and living in the space. Living between the inside and the outside, in the middle, under a shadow is one of the characteristics that struck several scholars, such as Walter Benjamin, during his travels in Italy.[5] Here, architectural forms have always manifested, as Albert Camus also describes, a concrete society characterised by reflective freedom and an altruistic individualism, which favours nature and moderation over excess and history.

This characteristic of urban life is linked to time: it self-regulates and self-feeds itself,

occurring precisely on the street. In 1969, the architect Bernard Rudofsky published the book "Streets of people, a primer for Americans": he defined precisely the importance of thinking of the street not only as a means of mobility about the American context but also as an architecture", as taught by the Mediterranean tradition. This cultural and environmental scenario testifies how the street is the architectural and urban element for maintaining the human scale, the testimony of walking as a fundamental act of human life.

In particular, therefore, mending this dimension through a "return to the street" and its nature as a public place of relationship means placing the attention once again on the space between the houses by retracing examples of public collective housing. It contributed to investigating not only the domestic dimension of internal spaces but also the open space proportion, creating a dimension defined as Mediterranean. In the analysis of the architectural project of collective housing, much more importance has always been given to the built form rather than to the shape of the void it left, of the open space and nature. This reading has sometimes been marginal in the evolution of the city's architecture, but instead, it can contain interesting food for thought for future insights and experiments.

So, it is becoming interesting to analyse this approach starting from the relationship between the street, collective housing and the city. This transition in the city at eye level, at a ground floor plan, allows us to define the space based on a human scale and to understand the pedestrian route as a theatre of ordinary events. It would represent an area of transition from chaos to harmony: this space manifests expanded domesticity.

Walking between the houses through Rome and Madrid

The post-World War II period was probably when Mediterranean, vernacular and picturesque influences most characterised our modern lifestyle.

In this sense, in the neorealist panorama, Rome and Madrid have represented a point of reference in the experimentation of collective housing: in particular, in the 1950s and 1960s, it is possible to find a common itinerary that, in addition to a careful reflection on domestic spaces, contributed to generating an atmosphere on a human scale among the buildings built.

Therefore, it is not only a question of analysing the formal characteristics and the language of architecture in detail, result of historical, political and social contingencies, daughters of the historical period in which they were built. Rather it is looking today at the space that the built parts leave free or on how some elements increase the richness of transit passages between the public and private dimensions.

In the 1950s, the important experience of the Ina-Casa, for example, in one of the first cases of the controversial season of Italian neorealism in Rome, in the Tiburtino District in Rome (1949-1954), offers us the possibility of recognising an interesting view of spatial articulation.

Manfredo Tafuri (1935-1994) describes the project plan as "vaguely informal and only marginally typologically controlled". The different buildings that make up the whole generate a series of spaces made up of houses only, except for some commercial buildings designed by Mario Ridolfi (1904-1984): their composition perspective returns an image that rushes towards a variety of spaces that "abandons any planimetric rhythm and which, despite some inconveniences encountered, offers advantages over previous urban compositions".[6]

Today, through the transition space on the ground floor, a domestic atmosphere alien to the rhythms of the surrounding suburbs envelops the originally planned area. The different typologies (towers, houses in line,

terraced houses), the pedestrian paths, the covered passages and the urban gardens recreate the dimension of a village, which nowadays, despite some appropriations by the inhabitants, clearly shows its relationship with the city.
Walking along the neighbourhood, from the public space to the private one highlighted the sensation of advancing by stages and episodes. If on some occasions, this atmosphere is produced by gradual, covered and uncertain passages, it is through the elevated road designed by Ridolfi, like an urban corridor over the city, that it manifests itself most clearly and without mediation. The gesture thus makes it possible to generate a separate entrance to the houses in line on the ground floor, filtered by a private patio, and one to those on the first floor, doubling the role and dimension of the street: the district the district these solution in two parts. Today that the built surroundings have developed densely, and the streets have become the property of cars; the one located on the west side of the project seems to be defined in a more private way both for the inaccessibility to outsiders to the scale both for the position itself to the settlement.
In 1954 Gio Ponti wrote for a Domus Editorial article, "...we have lost from a design point of view..." he defines the Italian way "…between the Anglo-Saxon and the German approach of collecting single-family housing in the garden city, and that of grouping the house into a large machine as in Marseille, we have the Italian way of the *rione*, which means the approach of bringing some houses together in single structures, gathering them very close, creating spaces small and alive, constantly varied and always commensurate with the person, his habits and his essential pleasure...".[7]

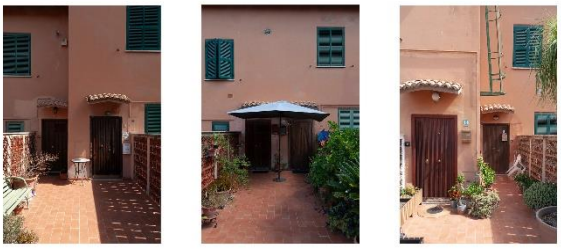

Figure 1. Transition and domestic episodes in Ina-Casa Tiburtino, Rome. Ph. Emiliano Zandri©

Figure 2. Transition in elevated street in Ina-Casa Tiburtino, Rome. Ph. Emiliano Zandri©

Chronologically similar to the Roman Tiburtino intervention, the project for the Poblado Dirigido by Caño Roto (1956-1973), in the southwestern part of Madrid, expresses an interesting relationship with the street.
Unlike the roman neighbourhood, the space designed in the plan presupposes an order and a rhythm that contextually defines the hierarchy of the open spaces, even before that of the built ones: the reiteration of the spatial sequences that made evident the compositional strategy. Furthermore, the decision to place the taller buildings in the northern part of the lot was determined by the need not to have shadows on the lower ones and by the morphology of the land itself. The structure of the system, relatively rigid and static, becomes dynamic through the topography of the land, showing a specific resistance to a desire for a "clean slate" proposed in that by Le Corbusier in the CIAM. In this perspective, the initial conformation of the ground helped the two architects, Antonio Vazquez de Castro and José Luis Iñiguez de Onzoño, to develop a series of spaces and platforms sized on a human scale which reconstruct some forgotten scenes of

Mediterranean-style life, such as children playing on the street[8], and small squares where to share knowledge and meeting opportunities. The size of the streets and the thought-out proportion with the "poly-typical" buildings generate different collective spatial opportunities and enrich the passage and transition in the urban scenario.
As they expand and contract, strolling in the neighbourhood takes on the most characteristic, and perhaps unexpected, value in walking the narrow streets that cut the settlement from northeast to south-west: here, Caño Roto is transformed into a small village, perhaps in the past even more accentuated by the materiality of the walls. The public space is compressed and squeezed between the types of patio houses. The simple entrance doors represent the thresholds through which the boundary between the domestic and the urban evaporates. However, precisely because of their small size that the inhabitants often transform them into an extension of their living room, a garage or a warehouse, an expression of the need to occupy, colonise and make the city their own. By leaving space in the centre for the lower buildings, areas of public use are created that are more protected than driveways. This organisation of pedestrian streets and squares responds to the common goal of creating a safer public urban environment with numerous green areas free from parking, placed in the external part of the lots.

Figure 3. Transition and domestic episodes in the street of Caño Roto, Madrid. Ph. Emiliano Zandri©

Figure 4. Transition in the street of Caño Roto, Madrid. Ph. Emiliano Zandri©

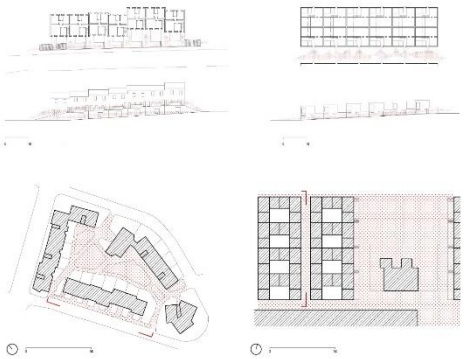

Figure 5. Transition in Ina-Casa Tiburtino (left) and Poblado Dirigido de Caño Roto (right): front and floor plan (portion). Drawing by author

Despite the transformations that have taken place over the time of the residential buildings, through informal appropriations or additions, the strength of the project is therefore still clearly visible precisely in the organisation of its open spaces. It allow for the definition of an atmospheric filter both between the residential unit and the immediate surroundings, both between the neighbourhood itself and the rest of the city.

In the metropolitan suburbs of contemporary cities, built with the logic of urban "sprawl", the proliferation of houses alternates with large abandoned and undefined spaces in a *continuum* without quality and in which everything seems to lose identity. Even in the case of public interventions for collective housing of architectural relevance, the projects tend towards a rather clear separation between the city and the building itself: the result is most often the construction

of a landscape in which any type of relationship and space liveability is difficult to create. At the same time, the densifying processes of the contemporary city have saturated the once peripheral areas.
Therefore, in a landscape mainly of closed spaces, these modern examples offer the possibility of reflecting on the value of the space between the houses. These examples continue to represent today a sort of anomaly in the city development, a syncope in the rhythmicity of urban space and time, where even today, it is possible to find a greater affective and immaterial dimension of the places, also highlighted with the image and the experience on the place.
These parts of the city, despite metamorphic and regenerative interventions that could have altered their architectural qualities over the years, seem to not only survive the habituation of the generic city but also maintain relevant characteristics based on relational processes, affectivity and customs spaces that become the most interesting elements on which to focus your gaze. This type of observation is almost paradoxical because it focuses on projects born to be conceived as objects of city expansion, a symbol of housing needs, hygiene, territorial definition and a whole other series of quantitative data that they left the phenomenological aspect of places in the background. Modern architecture has always brought a reading of physical space based mainly on tangible and built forms. Investigating today the sensorial capacity and resistance to the recognisability of some neighbourhoods means rediscovering their value in intermediate, open, colonisable and indeterminate spaces. This short-circuit could therefore pursue the objective of observing space by analysing forces that cannot be explained through objective data. The goal is to restore attention to the relationships and connections between architectural objects and bodies, to the dynamism of reality seen through today's eyes and times.

Conclusions

Although we can considered the examples as known, it is possible to recognise that today they increasingly represent a condition of an "anomaly" in the interpretation of life between buildings, particularly concerning the dimensional perception of the city that has grown up around them.
Often underused, forgotten, and no longer responding to the precepts of a certain type of collective life, the open spaces of transition between the home and the city still represent one of the most important resources of our life: understood as spaces of transition, they can transform in free and democratic spaces of relationship.
Bringing back gaze on these places can allow us to prefigure intervention and transformation strategies in other city spaces, even starting not so much from the objectivity of data but from everything that these data leave out. Precisely architecture and urban planning cannot be considered the only sciences capable of territorial modifications. It would be useful to incorporate the subjective and experiential role of the user in the analyses, learn to read the signs and stratifications, often informal and mistaken for degradation, perhaps not categorical in pre-established forms and styles but still a manifestation of an empathetic fervour of a given place. These margins of the neighbourhood between the house and the rest of the city can be re-read, not as a physical limit but as a malleable membrane in which to concentrate major efforts for the redevelopment, transformation and change of the urban environment, both for the neighbourhood itself and for the adjoining areas. This would make it possible to include in the housing practices and sense of domesticity belonging to the residents, passers-by, of occasional users. The availability of open and green spaces is decisive for thinking of promiscuous and collective urban places, in which temporary

activities and equipment coexist with the permanent ones for the construction of coexistence and contemporary identity for the places we will live in, rediscovering an intermediate dimension of living. It is there, in fact, that more than anywhere else is, the quality of a neighbourhood is measured.
Just retracing its traces can help us to build up a new possible one, reading the contemporary needs of our life stylings. The city at eye level is important because it creates affinity and generates participatory, self-organising and coalition processes among citizens.
The overcoming of the concept of the traditional family and the increasing percentage of people living alone (young, old, single fathers and mothers) should be translated into design experiments allowing greater interrelationship possibilities, collective interactions and contact with the environment that surrounds us.
The urban settlement can often be the scene of collective demonstrations and appropriations in the common areas. The open courtyards can become intergenerational collective halls, the drying racks playgrounds, and the small squares with barbecues collective kitchens.
Moreover, nowadays, because of the need for a new ecological lifestyle, we can understood the transition space as a phenomenological space in which a fundamental role has been recognised throughout history. This would include, in its meaning, reflections which concern not only human well-being but also other species, creating an enlarged domestic landscape. This theatrical scenario interacts with the movements and activities of all living being.

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Bio-informed architecture: material transitions to embody the cycles of life and death in the built environment

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ABSTRACT

Our ecologic relationship with the otherness is a mixed, chaotic dialogue among heterogeneous entities. Ecology is in fact a radical concept: it can also take on the connotations of a "toxic intrauterine experience" (Morton, 2018) as we co-exist with impurities and toxic substances that we produce, or with non-human entities like viruses, with which we can get infected.

The covid-19 pandemic deeply mutated the way we perceive our co-existence with the non-human, enhancing a new collective consciousness on the ontological continuity that we establish also with pathogens and toxic substances, through an unconscious bioaccumulation process (Åsberg et. al., 2019).

Non-human actors escape our control and they have their own agency, even when caused or boosted by anthropogenic factors. For this reason, our daily routines were shaken during the last two years, also in the way the pandemic impacted how we experienced our private and public spaces and, in general, the built environment.

In light of this, can we envision new perspectives in design cultures and architectural experimentations, to raise awareness on the unavoidable co-existence with the non-human others?

Indeed, the active contribution of architecture to the promotion of new forms of co-habitation can be relevant to recognize the entanglement between species, starting from a reflection on the materials which "inform" our spaces and mediate our experiences.

Architecture as a designed artifact establishes per se a performative relation with the *invironment*[1] (Schwägerl, 2014) in which it is rooted, by intra-acting (Barad, 2017) as an element of perturbation of a pre-existing condition. At this point, it becomes crucial to redefine the spatial context no longer as a background of human actions, nor as an empty space to be anthropocentrically colonized; rather, it is a place already full of intraspecific relationships that could be valorised also through the resemantization of designed spaces as potential supporting interfaces for a multispecies co-existence.

A challenge is in fact represented by the need to develop a heuristic perspective where humans perceive themselves as a knot intertwined in a global system of relationships, while assuming a decentralized and "peripheral" position, rather than an anthropocentric role of superiority over other species.

Can this objective be achieved by shifting the traditional notion of dwelling in order to promote the inclusion of non-human species, which are generally excluded from the project?

In an attempt to reconfigure the relationship between architecture and nature in an eco-syntonic way, as architects it is important to consider the possibility to change the way we use to design the built environment. In this context biomaterials, as an alternative to traditional building materials, can play a key role in stimulating a debate around the concept of dwelling by promoting bio-

[1] «In the Anthropocene there is no longer an “inside” and an “outside”, no alien, antagonistic nature with which rational humans are faced. The environment becomes the “invironment”. Instead of untouched nature, there is only touched nature. In the nature of the future, humans will encounter themselves and the former results of their previous actions». See Schwägerl, C. (2014*). The Anthropocene: The Human Era and How It Shapes Our Planet*, Synergetic Press, p. 110.

informed architectural spaces which are the result of the combination of human and non-human agencies. Architecture thus turns into a medium that supports biodiversity, reinforcing our ecologic relationship with the otherness besides its primary role of "human container".
The integration of biological matter and living organisms (like mycelium, algae, protocells, molds and bacteria) can also help to achieve better ecological performances as the interaction with the ecosystem is based on a positive feedback loop where architecture is structurally coupled with human and non-human inhabitants and helps creating an autopoietic system (Maturana&Varela, 2001).
Moreover, since the use of biological organisms could also generate unforeseen circumstances related to the unpredictability of living systems, a bio-informed architecture could represent a mean to overcome the anthropocentric desire of being in control and to go beyond human mastery.

A concrete, practical case study that demonstrates this concept is represented by the hands-on activities of biofabrication, based on the do-it-yourself creation and experimentation of biomaterials. The purpose is to promote material activism (Ribul, 2013) through embodied practices in which a bottom-up approach, based on open-source recipes and low-tech tools, stimulate the creativity of designers around new forms of co-living where the matter which inform our spaces and objects is bio-based.
By incorporating agents commonly considered perturbing and toxic (like moulds and bacteria), the ultimate goal is to shift from a puritan aesthetic canon of permanence and immobility, to the notions of dirt, impure, non-permanence and transition, as architectural spaces and design objects are linked to the cycles of life, death and (bio)degradation related to the biological matter with which they are composed.

KEYWORDS
biomaterials; bio-informed built environment; multispecies habitats; non-human; ecology, toxicity and death

1. Introduction: Unexpected interplay

The building sector is responsible for almost the 40% of global CO_2 emissions[1], having a high impact on the ecosystems equilibrium, also because of the anthropocentric perspective which is merely promoter of human interests. In the last decades the environmental consciousness has significantly increased, but many challenges still to be addressed to increase the sustainability of the built environment.
Conventionally, history places humankind in a privileged position pointing out an illusory emancipation from nature, which allows a bias in favour of humans' interests, as they are recognised the members of the predominant species. At the same time, while we recognise our role as human beings in the biological balance, it is also important to overcome the environmentalist rhetoric. In many environmental and animist movements, the "untouched wilderness" is in fact identified as the only condition we should look for in order to overcome the anthropocentric desire to act over nature. Nevertheless, this idea is obsolete as reinforces an ontological separation between human and nature, leading to a fetishist representation of the natural domain and preventing to move

[1] For more information see "2021 Global Status Report For Buildings And Construction" available at: https://globalabc.org/resources/publications/2021-global-status-report-buildings-and-construction [last accessed: 12/09/2020]

towards a much-needed paradigm shift where "nature" and "culture", human and non-human are conceived as constitutionally linked.
The solution is to develop a heuristic perspective where humans recognise themselves as part of nature and knots intertwined in a global system of relationships, while assuming a decentralized and "peripheral" position, rather than an anthropocentric role of superiority over other species.

Humans' interdependent relationship with the non-human world is in fact a complex entanglement (Ingold, 2000) and a mixed, chaotic dialogue among heterogeneous entities. Therefore, ecology turns out to be a radical concept when we take into consideration that it may also implies "toxic intrauterine experiences" (Morton, 2018) which are out of our control.
By acknowledging this, we open to the fact that we cannot avoid our co-existence even with impurities and toxic substances that we produce, or with non-human entities like viruses, with which we can get infected.
In this respect, the covid-19 pandemic deeply mutated the way we perceive our co-existence with the non-human, enhancing a new collective consciousness on the ontological continuity that we establish also with pathogens substances, through an unconscious bioaccumulation process (Åsberg et. al., 2019).
At this point, it is crucial to question how we can develop a new approach to design which is able to support multispecies co-habitation and co-evolution, also in a context in which non-human actors escape our control and have their own agency.

Also in light of achieving better ecological performances, as designers we should ask ourselves: can architecture become a tool to actively support biodiversity? Can we envision new perspectives in design cultures and architectural experimentations, to raise awareness on the unavoidable co-existence with the non-human others? And finally, can we think about our future cities in terms of multi-species habitat, where the different abiotic and biological forces interact in a mutualistic and non-parasitic way?

Although it is legitimate the need to pragmatically respond to human needs, at this point it is in fact crucial to also support a more systemic vision towards a wider ecosystem of interests and to redefine the concept of dwelling as a dialogic space for a multispecies co-existence.
Architecture as a designed artifact establishes per se a performative relation with the "invironment" (Schwägerl, 2014) in which it is rooted, by intra-acting (Barad, 2017) as an element of perturbation of a preexisting condition. Therefore, we need to redefine the spatial context no longer as a background of human actions, nor as an empty space to be anthropocentrically colonized; rather, it is a place already full of intraspecific relationships that can be valorized.
In the following paragraphs we will see how generate new opportunities to radically integrate non-human actors as co-designers, conceiving nature as an entangled process with culture, and not just as an entity to preserve and protect from humans, nor as a model to objectify or exploit.

2. Co-designing with the non-human

In an attempt to reconfigure the relationship between architecture and nature in an eco-syntonic way, as architects it is important to consider the possibility to change the way we are used to design the built environment.
Traditionally, the building sector produces an incredible amount of waste material which has a permanent character and compromises the biosphere with its residues. In this context, biomaterials, as an alternative to traditional building materials, can play a key role in promoting a material ecology (Oxman,

2010) based on the integration of biological matter and living organisms (like mycelium, algae, protocells, moulds and bacteria) to reach better ecological performances and support a long-term positive interaction with the ecosystems even during the end-of-life stage.
Following these premises, we propose a set of dichotomies among different concepts, theories and approaches grouped in short paragraphs, with the final aim of providing new perspectives to recognize the non-human others as active contributors within bio-informed architectural processes. Specifically, we will introduce: ecosymbiosis as a concept to go beyond biomimicry; endosymbiosis as a key evolutionary theory to envision a new design perspective towards a more inclusive relation among human and non-human; the need to go towards a bio-informed city through the valorisation of biological intelligence; finally, we will suggest how to go beyond functionalism in order to perceive architecture as a living entity entangled with the environment.

2.1 Biomimicry vs Ecosymbiosis

Although we recognize a considerable value to Biomimicry as a discipline and a research-based practice of learning from and then emulate nature's forms, processes, and ecosystems (Benyus, 1997), or to other researches dealing with bio-inspired design, on the other hand, a bio-informed architecture aims at promoting a more radical and symbiotic incorporation of the non-human.
As Rachel Armstrong stated in her “Manifesto against biological formalism” (Armstrong, 2011), even though we are used to compare urban spaces and the biological domain through the metaphorization of biological forms and functions (e.g. infrastructures are often associated to the cardiovascular system), we still use mainly inert materials to inform the urban environment.
To overcome this habit, we should not objectify nature as an inspiration, a metaphor or something to be artificially reproduced through biological formalism. Rather, we should recognise its ontologically continuity with the human domain and therefore assume the non-human as potential co-worker also when we envision spatial solutions.
The implementation of biomaterials or living organisms could be in fact a game-changer in the processes of transformation and adaptation of the built environment.

2.2 Evolutionary competition vs Endosymbiosis

Despite the great popularity and scientific recognition of the Darwinian theory as the basis of modern evolutionary theory, in the mid-1960s researchers stressed the importance to bring cooperation and co-evolution between species, rather than competition, at the core of evolution.
The American evolutionary biologist Lynn Margulis was the first one to propose this perspective in 1965, when she discussed her PhD thesis "An Unusual Pattern of Thymidine Incorporation in Euglena" and officially presented the endosymbiosis theory. According to this theory, bacteria in symbiosis with the organisms in which they are incorporated establish a cooperative relationship based on a mutual evolutionary advantage for both the symbiont and the hosting organism. Their mutualistic relationship ultimately enables to progress evolutionarily more than other organisms.
In this perspective, endosymbiosis represents a significant shift to a more biocentric point of view on evolution, where human beings are not just the dominant and more evolved species, rather they are also entangled together with the non-humans in order to (co)evolve. In fact, the complex ecosystem of microorganisms which is part of our microbiota is an example of how we also build

symbiotic relationships with non-humans to survive.
In the same way, we can explore how architecture can be defined as a living organism, therefore developing a new concept of evolutionary architecture (Frazer, 1995) which co-evolves in symbiosis with the environment and with other species.

2.3 Smart City vs Bio-City

The term "Smart City" refers to a model in which urban planning is related to improving the life of citizens through a wide implementation of innovation and new technologies, as they are considered a source to promote growth, urban development and inclusiveness, but also new forms of social cohesion.
This model can be further implemented by shifting to the concept of "Bio-City" (Poletto, 2018), which identifies a city in co-evolution with its context also through the employment of innovations related to the fields of biology and biotechnology. Compared to the Smart City, the Bio-City therefore aims at increasing the quality and quantity of the urban biological substrate, by assuming the bio-network as starting point for the urban planning.
The result is a new urban ecosystem, where the biological and urban networks mutually support each other.

2.4 A.I. vs Biological intelligence

A direct consequence of the Bio-City model is the valorisation of biological intelligence. The objective is to facilitate the inclusion of living organisms as co-agents of design processes.
This perspective can be realized in various ways:

- through synthetic biology, which enables to program the behaviour of microorganisms like protocells in order to make them respond to external factors (e.g. carbon sequestration) through chemical self-organization, therefore generating a bio-active facade when they are embedded in architectural claddings;
- with the embodiment of living and growing materials (e.g. microalgae, mycelium-based bricks) in the architectural envelope in order to improve the sustainability and metabolism of buildings, generate biomass and, thanks to their CO_2 capture and storage capability, have near zero emissions also during the end-of-life stage, as the majority of these materials are also compostable;
- by studying non-human's behaviours and reactions to specific external conditions (e.g. humidity, sun/light inputs, food source, hormones) with the aim of coupling biological intelligence with technological devices and create a bio-cybernetic tool for design. Technological devices are crucial in order to observe the biological behaviours, collect data, send back the necessary inputs to the non-human, map and finally "translate" in operational algorithms the biological outputs. This feedback loop process leads to co-design a final artifact which is result of a direct collaboration between living and non-living actors.

2.5 Functional vs Living

In a somewhat provocative way, our final proposal is to overcome the functionalist approach in architecture, in order to embrace a new paradigm conceiving architecture as a living organism per se. Le Corbusier's idea of architecture as a machine therefore gives way to an architecture able to act as a biological organism, thanks also to the presence of biomaterials and living organisms in its structure.
The aim is to deconstruct a set of dichotomies, such as inside/outside, pure/contaminated, wild/domesticated, that are used in the

sterilization narrative to categorize persons and spaces. These dichotomies serve as both ontological and physical barriers.
Instead of sterilizing borders, contemporary space and architecture need to be conceived and designed as ecosystems that support and host human and non-human.
It is therefore relationality that establishes the "functional" aspect, representing the ability of built environment to trigger systemic processes of bio-reception and to finally be "alive" and responsive to natural cycles.

3. Embodied, material practices: a case study

All the above-mentioned approaches suggest the possibility to promote a new concept of dwelling through bio-informed architectural spaces, which are the result of the combination of human and non-human agencies, beyond the primary role of architecture only as “human container”.
A concrete, practical case study in support of this concept is represented by the hands-on activities of biofabrication, based on the do-it-yourself creation and experimentation of biomaterials. The purpose is to promote material activism (Ribul, 2013) through embodied material practices based on a low-tech strategy to democratize material development and manufacture.
This also encourages to learn how to develop innovative models to replace conventional industrial ones, inspiring new aesthetics and triggering new scenarios as we envision the potential application of organic residues, fungi, algae, bacteria and mould within the built environment.

This method of self-production of materials is important as enables designers to become the promoters of a new material development and finally enter into the logics of materials development (Rognoli, 2018) in order to achieve the desired material experience.
Additionally, with this approach we can also incorporate the “darker” and uncanny aspects related to ecology and strengthen the activist role that we can have in promoting a systemic change. To achieve these results, open-source recipes and low-tech tools are used for in-house material experimentations in order to stimulate the creativity of designers. By testing different concentrations of the bio-based components, it is in fact possible to bring new reflections as the final material takes shape. In this perspective, the samples incorporating different concentration of microalgae spirulina and musk (See Figure 1) were produced to reach different textures and material properties, such as the possibility to shape the privacy of the building according to the concentration of the infill, or to embody these bio-based materials with the aim of making architectural spaces more responsive to environmental conditions (e.g improving the CO_2 sequestration and therefore the overall indoor quality).

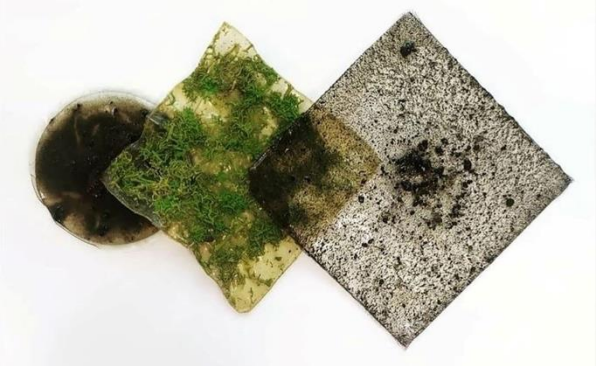

Figure 1: Samples of bioplastic sheets obtained using different concentrations of microalgae spirulina and musk. Author and credits: Selenia Marinelli.

Among the most recent experimentations, I experienced the cultivation of kombucha as a model of multispecies cooperation and conflict within a microbial ecosystem, to stress the co-habitation and co-creation process between human and non-human. The SCOBY, an acronym that stands for Symbiotic Culture/Community of Bacteria and Yeast, is in jargon identified as "mother kombucha", and when immersed in a culture composed of sugars and tea starts a growth process through fermentation.
The latter involves complex phases of cooperation and conflict, in which bacteria

and yeasts interact with the sugars and progressively synthesize a biofilm of bacterial cellulose, which has the function of protecting the ecosystem from the invasion of other microbial competitors.
The cultivation of kombucha is, therefore, a very delicate process: I first had to proceed with the creation of a sterile habitat that would allow the cultivation to proliferate. Furthermore, kombucha takes several weeks to develop its biofilm. Therefore, constant monitoring was necessary and this procedure established a phase of co-existence between me and the non-human organism. As soon as the biofilm reached the desired thickness, I stopped the further growth of bacterial cellulose and the subsequent drying phase generated a biological skin very similar in colour, texture and consistency to that of humans and animals. The final result triggered additional reflections on how kombucha leather could be used in textile applications, biomedical engineering or even in architectural settings, to create visceral spaces which seem to pulsate and are strictly linked to the cycles of life and death of the living matter with which they are composed and which is subject to the flow of time (see Figure 2). The use of biomaterials can in fact facilitate the debate on the necessity to incorporate the idea of the temporality as part of our design strategies, taking into consideration the cycles of life and death related to the deployment of bio-based materials or non-human living organisms as co-workers in the design process.

Figure 2: Bacterial cellulose sample grown from a SCOBY (symbiotic culture of bacteria and yeasts). The bacterial cellulose was dried after the fermentation process and it could be used as a vegan alternative to animal leather. Author and credits: Selenia Marinelli.

Embracing an activist approach towards materials can stimulate a deeper reflection on the entire life cycle stage of the products in general and on the impact of our actions, paving the way towards more responsible ways of production, consumption and life styles.
Communities in general can play an active role in the co-construction of new forms of adaptation to climate change, being more aware on the materials that "in-form" our spaces and mediate our experiences. In this respect, the fabrication of bio-tiles made out of food waste aims at opening a discussion on the possibility to support alternative ways of building material production, based on our habits as food consumers (see Figure 3). Eggshells are 90% constituted by calcium carbonate, which is a chemical component required to generate binder gel in cementitious materials. Therefore, they can be used as cement replacement in construction materials, decreasing the mining activity. With regards to walnut shells, they are rich in lignin and can be used for many

design applications, without the need to cut down trees.

Figure 3: Bio-tiles made from different residues and biological, organic matter (eggshells, walnut shells). Author and credits: Selenia Marinelli.

4. Conclusions and discussion: Co-existence, toxicity and death

Biomaterials are to become a sustainable alternative to conventional building materials and represent a shift to more flexible, dynamic and recyclable ways to design a bio-informed built environment which is inherently adaptable and transformative, rather to be just a static container.

By incorporating agents commonly considered perturbing and toxic (like moulds and bacteria), we can shift from a puritan aesthetic canon of permanence and immobility, to the notions of dirt, impure, non-permanence and transition, as architectural spaces and design objects are linked to the cycles of life, death and (bio)degradation of the biological matter with which they are composed. In this perspective, practice-based research supporting hands-on experimentations allows designers to enrich material experiences paving the way towards more responsible processes of production.

Even if the inclusion of living organisms represents a major potential in bio-informed architecture, it can also be challenging as there is need to establish methods and procedures in order to have controlled biotransformations and be closer to the architectural performances of conventional structures. In this case, the interdependence between the architecture and the non-human requires the capability of navigating and negotiating nonlinear behaviours linked to the presence of biological matter.

Nevertheless, since the use of biological organisms could also generate unforeseen circumstances related to the unpredictability of living systems, this approach to design serves as a mean to overcome the anthropocentric desire of being in control and go beyond human mastery, in order to radically embed the complexity of human and non-human intra-actions in our design practices.

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