DESIGN CULTURE(S)

Cumulus Conference Proceedings Roma 2021

Volume #2

Cumulus Association

Cumulus Conference
Proceedings Series
07/2021 Rome

Design Culture(s)
Cumulus Conference
Proceedings Roma 2021
Volume #2

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Layout and Graphic Design
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Concept for Cumulus
Conference Proceedings
Series was developed in
2018 by Jani Pulkka

Cumulus conference
Design Culture(s)
hosted by
Sapienza University of Rome, Italy
on June 8-11, 2021.
Conference website:
www.cumulusroma2020.org

Published by Cumulus
Cumulus the Global Association of
Art and Design Education and
Research. Aalto University, School
of Arts, Design and Architecture
PO BOX 31000, FI-00076 Aalto
www.cumulusassociation.org

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ISBN 978-952-64-9004-5 (PDF)
ISSN 2490-046X
Cumulus Conference Proceedings
Series, N°7

Cumulus Conference
Proceedings Series

Editor-in-Chief
Cumulus President
Mariana Amatullo

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Cumulus Conference
Proceedings Series

Cumulus the Global Association
of Art and Design Education and Research

Rome 2021

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DESIGN CULTURE(S) | CUMULUS ROMA 2021
JUNE 08.09.10.11, SAPIENZA UNIVERSITY OF ROME

About the conference

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The theme

More than three years ago (it was 2018), when we presented our candidacy to host the Cumulus Conference in Sapienza, our first effort was to set up a Conference Theme. The duty was not simple since we wanted to avoid any naïve, fashionable or captivating topic. We were in search of a theme which is appropriate to the times, the context and moreover, to the Cumulus's community.

Our starting point was to consider what Cumulus meant and still means, not only for us, but within the worldwide design community. Looking back in the history of Cumulus, we found an interesting picture in its name: in fact, "cumulus" is the English name of a specific kind of clouds and comes from a Latin word that means "heap, pile, mass". Therefore, the word Cumulus is refereed, at the same time, to those big clouds that appear in the sky every time in different forms and always in constant change, as well as it is referred to a set of singular elements that make up a unit together. As a consequence, Cumulus efficiently describes the idea of a set of many singularities that meet, settle and become each time a new and different entity.

This picture helped us to set our goal: offering to such variegated, mutant, but nevertheless aggregated "cumulus", a conference theme where to recognize itself. This idea of big entity made of a huge number of singularities is connected to the idea of community, and then we had no doubt that this was the exact purpose of the founders of Cumulus when they decided its name.

Today the concept of community is increasingly complex, since it is crossing new social, technological, political and economic challenges and at the same time it is more global and multicultural than ever, more and more enriched by new hybrid languages and habits, due to the increasing flows of goods and people around the world. As a consequence, also a

Design Community, as Cumulus, is evolving as a wide-open field with many new practices and sometimes new principles.

In this regard, in order to figure out such complexity, we found a suitable answer in another word with Latin roots: the word "culture". Culture comes from the Latin word "colĕre" which means "cultivating the land to make grow" and, figuratively, also "taking care" of something, including knowledge, and therefore, "cultivation through education, improvement and refinement of the mind". This second meaning of "culture" is based on an insightful concept by the ancient Roman orator Cicero in his Tusculanae Disputationes: "cultura animi", which is the cultivation of the soul.

The resulting parallel between the culture of the land and the culture of the soul was fascinating and highly significant to us, since it is showing the challenge of growing something new, starting from the roots, from the soil, from the context and - as we know - depending on available soil, context and roots, we are growing different plants, obtaining different fruits and seeds, to plant again in a virtuous life-cycle. Thanks to this metaphor, we understood that diversity is a prime condition for the birth and the growth of culture, while it doesn't mean opposition but combination, arrangement and hybridization. Thanks to this metaphor, we got back to the initial concept of accumulation, and to the concept of Cumulus.

On another note, the Cambridge English Dictionary states that culture is also "the way of life, the customs and beliefs, of a particular group of people at a particular time". This could be an interesting stimulus but, when associating "Culture" with "Design", it was immediately clear that we cannot refer to one unique Culture, but we need to open to the concept of bio-diversity, where Design cannot be considered as the result of a single dominant, globalized, levelling thinking.

Finally, looking into design as an expression of Culture(s) and Culture(s) as the outcome of Design means to take into consideration not only what we are doing now, but what we are inheriting from the past and which should be granted for the benefit of future generations, so intertwining past and future, tangible and intangible, innovation and tradition.

Here is our conference theme: Design Culture(S)

Here, the suffix (S) is not only indicating the plural, the diversities, but it is also connected with the "saxon genitive", which is taking Design as subject, while connecting it to other different objects/meanings.

Following this concept, we found the ten keywords which we used to describe the tracks:

Artificial, Languages, Life, Making, Multiplicity, Proximity, Resilience, Revolution, Thinking and New Normal.

Each keyword was enriched with three additional keywords, to better explain the different directions and connotations, which are:

- Artificial is connected with Digital, Technology, Robotics
- Languages is connected with Aesthetics, Expression, Visual
- Life is connected with Nature, Biology, Human
- Making is connected with Process, Production, Post-Industry
- Multiplicity is connected with Gender, Pluralism, Diversity
- New Normal is connected with Health, Education, Work&Play
- Proximity is connected with Places, People, Economy
- Resilience is connected with Social Innovation, Circular Economy, Sustainability
- Revolution is connected with Critical Thinking, Interruption, Change
- Thinking is connected with Theory, History, Criticism

We obtained 40 wonderful words, full of possible meanings, ready to be interpreted and declined by the worldwide community of cumulus to figure out Design not as a singular specific voice but as a plural ecosystem of meanings.

After three years, during which our world is extremely changed, we can say that these words and this topic seems even more current and significant.

In the next pages of the Conference Proceedings, we are very enthusiast to offer a big picture of the biodiversity of Design Cultures and the multiverse of our Cumulus.

The experience

Cumulus Roma 2021 'Design Culture(S)' covered four days full of parallel sessions, working groups, poster sessions, exhibitions, social events, and more, but above all attending was a new form of experience than a conference.

While feeling the responsibility of filling a long void caused by the pandemic, we tried to re-design the whole experience to deliver a new form of conference which is keeping the in-presence through the online opportunities, so to bring you all to Rome and get the colors, the smell and the taste of the city, the architecture, the arts, the food, and the wine, always giving a cultural and a scientific perspective.

When facing the challenges, we wanted to deliver a new format to the whole Cumulus community, with the aim of innovating with technology, enhancing networking and the sociability of the experience, and keeping everyone on board to ensure the participation and democracy to our association from anywhere in the world, no matter of the time zone.

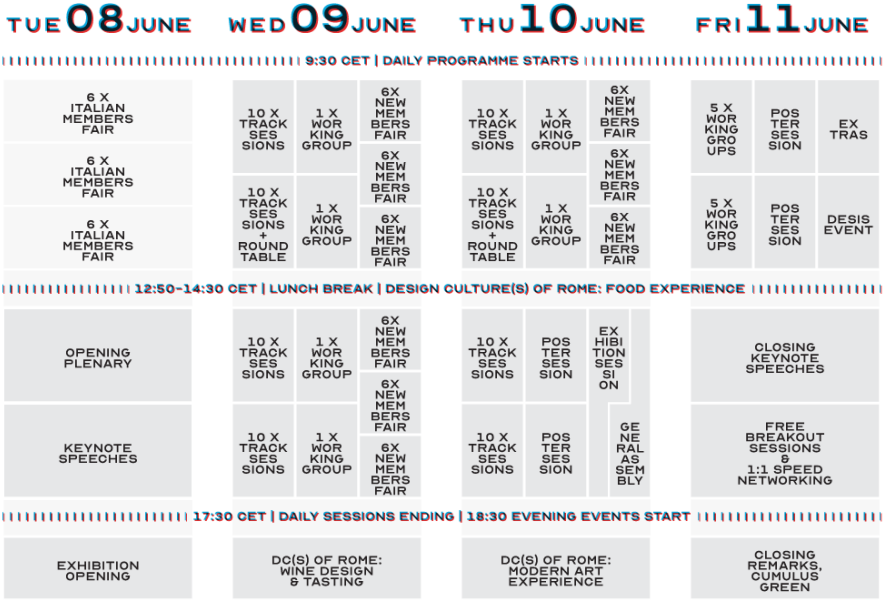
After four full days, we trust this conference at Sapienza University of Rome to be one of the longest Cumulus initiatives, counting with approximately 680 attendees, more than 350 papers and posters, 10 exhibitions, 10 tracks and 80 parallel sessions, 20 track keynotes and

four plenary keynotes, more than 50 schools exhibiting in the New Members Fair from everywhere in the world, and 18 schools participating in the Italian Members Fair.

Our aim was to develop a new form of hospitality to welcome and to make all of you feel at home in Rome but in a new virtual environment, while sharing design research and knowledge, along with the true spirit of Cumulus.

It is not enough to have a good project to gain good results, but it is necessary to get good responses. Your reaction was extraordinary, not only for the massive amount of registered participants, but for the involvement, the enthusiasm and not lastly the patience you have shown during the days of the conference. You joined in perfect Cumulus style from all over the world: from Oceania to the Americas, from Africa to Europe, to Asia, and you have actively followed the four days continuously, participating in a chat that often could not make your voices heard, but made us feel your presence very close.

Thank you for trusting us since the very beginning to the very end, while making this event possible. We will remember it for a long time for its extraordinary nature. We wish we will meet all together soon again without mask, and we will keep the memory of these days together among the best memories of this difficult period.



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LANGUAGES
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MAKING
PROCESS
MANUFACTURING
POST-INDUSTRY

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Oscar Tomico, ELISAVA Barcelona School of Design and Engineering

MULTIPLICITY
GENDER
PLURALISM
DIVERSITY

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NEW NORMAL

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EDUCATION
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PROXIMITY

PLACES
PEOPLE
ECONOMY

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RESILIENCE

SOCIAL INNOVATION
CIRCULAR ECONOMY
SUSTAINABILITY

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CHANGE

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THINKING

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Keynote speakers

Roberto Marchesini

Roberto Marchesini is Director of the Center for the Study of Posthumanist Philosophy, as well as the School of Human-Animal Interactions, both based in Bologna, Italy. His studies focus on philosophical ethology, bioethics, zooanthropology, and posthumansism in an effort to better comprehend human-animal interactions. The cornerstone of his philosophical proposal is the unmasking of a perspective error that places humans at the center and at the measure of his predicates. One of his last books reinterprets the union between human beings and technology as a partnership that emerged from the phylogenetic set of the Sapiens species, highlighting the hybridizing and shaping potential of technology. From this perspective, every invention, every discovery, has an epiphanic effect; that is, it opens up a new dimension of the unexpected and of opportunities that change the boundaries and the perception of what we define human.

Salvatore Iaconesi and Oriana Persico

Salvatore Iaconesi is a robotic engineer, designer and artist; Oriana Persico is a cyber-ecologist, autobiographer and expert in digital inclusion. Living and working together since 2006 under the brand [AOS – Art is Open Source], they created artworks and performances of global interest united by the exploration and observation of contemporary technological human beings and societies – and their continuous mutation. Promoting a possibilistic vision of the world in which art is the glue between science, politics, anthropology and economics, they are the founders of Nuovo Abitare and HER, the two research centers they use to study the psychological and social implications of data and computation in human societies. Together they wrote Digital Urban Acupuncture (Springer, 2016), La Cura (Codice Editore, 2016), Read/Write Reality (FakePress Publishing, 2011), Romaeuropa FakeFactory (DeriveApprodi, 2010) e Angel_F: diario di vita di un'intelligenza artificiale (Castelvecchi, 2009).

Pier Luigi Capucci

Pier Luigi Capucci has been concerned since the ‘80s with the studies on communication, the new media and the new art forms, and with the relationships among arts, sciences and technologies. His theoretical activity is concerned with technologies of representation and communication, with technoscience-based art forms and with the media archaeology studies. He published more than 350 texts in books, magazines and conference papers in Italy and abroad. Founder of the first online magazine in Italy NetMagazine / MagNet; president of Noema, journal on the relationships between forms of expression, technologies, sciences and society; member of the International Advisory Board in many editions of Ars Electronica. Recently he founded art*science, a three-year research project on art and climate change and he serves as a consultant to the European Commission on the relationships between scientific disciplines and technologies (in particular Artificial Intelligence and Big Data) and humanities.

Chiara Luzzana

Chiara Luzzana is an Award-winning Sound Designer. She pairs a broad range of leadership in Sound Design, Music Composition, Sound Branding, Soundtrack and Audio Installation collaborating with companies and agencies all over the world. Noted among others for her project “The sound of city”, she explores and listens in awe to the artifacts of the urban environment, the products of the industrial cultures all around the world. Eclectic Artist, she wanted to break the rules imposed by notation, working only with noise. Former student at Berklee College, she investigated how the brain reacts to sounds, experimenting with everything from the neurobiology of musical cognition, to the construction of microphones and sound sculptures. Her projects and talks take us to a journey starting from listening to our life, up to listening to ourselves turning life into a “soundtrack”.

About Sapienza University of Rome

Faculty of Architecture and School of Industrial Design

The conference took place at Sapienza University of Rome, Faculty of Architecture. Sapienza University of Rome was founded in 1303 by Pope Boniface VIII and it is one of the oldest universities in the world. At the moment, Sapienza is hosting about 115,000 students and 4.000 professors and researchers, and it is a top performer in international university rankings, thanks to the 63 Departments organized in 11 Faculties driving high levels of excellence in several fields.

The Degrees of Design are part of the Faculty of Architecture, which was founded in 1920 and it happens to be the first modern Faculty of Architecture in Italy. At the core of its mission is the commitment to innovation, technology, urban living, while serving a fast changing society.

Its programs and curricula are divided between scientific research, studies in the humanities and experimentation with old and new technology. All this is leading to the education of the modern designer, which can be considered the synthesis of a scientist and a humanist who is both an artist and a technologist at the same time.

After the Degrees in Design, the Faculty is also offering programs in architecture, city planning, landscape, interior architecture and design management. Its high-calibre graduates are equipped with the skills which are necessary to design and to manage sustainable products, systems, services and environments, leading to innovation, technology, visual communication and design.

The Design Degrees in Sapienza are the following:

- A Bachelor Degree in Design;
- An International Master of Science in Product and Service Design (in English);
- A Master in Design and Visual and Multimedia Communication;
- An Interdisciplinary PhD Program in ‘Planning, Design, Technology of architecture’.

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Awareness, compatibility and equality as drivers to resilience in sustainable design research.

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Abstract | Nowadays resilience, beyond its relevance for economic studies, is becoming of fundamental importance in Design for sustainability, inclusion and social improvement. Around this term, the authors have developed and experimented a design strategy, tools and methods for sustainable and inclusive design researches and teaching, which are based on three concepts: Compatible, Aware and Equal. The approach is human centred with a mix of different applied methodologies that variates according to the context and the research purpose. Multidisciplinarity and Co-Design are constant, while tools like QFD have been redesigned and adapted to the new methodological requirements. In this paper, authors will discuss about their design strategy by analysing some experiences in various fields such as cultural heritage or Internet of Things for increasing awareness, sustainable lifestyle and intergenerational sociality. Three examples will be illustrated evaluating their result and impact on the society in terms of awareness, compatibility and equality.

KEYWORDS | RESILIENCE, SUSTAINABLE DESIGN, DESIGN RESEARCH, DESIGN METHODS, HUMAN-CENTERED DESIGN

1. Introduction

According to Bauman (Bauman, 2012), the world is losing its solidity day after day. Organizations are becoming more versatile, life forms more fluid, projects more flexible, and choices are becoming less rigid and, if possible, reversible. This (almost) fluid world emerges from the previous (almost) solid world of the XX century. In fact, in the last century, industrial societies were more stable and solid. The productive and organizational society was more solid as well as the connections between people and communities.

This solidity was mainly related to two reasons: the first reason was the poor-mobility of goods and people. In the XX century, people were economically “confined” to their land and their physical houses since traveling and moving were very expensive and only for very rich people. The second reason is linked to the limits of information transmission. Communications were slower for the language barriers and for the slower speed of the communication media. In addition, one layer of solidity was added by permanence over the time of social and cultural conventions. Such conventions in fact guaranteed a solid resistance to the mutation of local organizations. Nevertheless, the scenario of the world is different now. The global connectivity has gradually “melted” the solid structure of the old world. Consequently, the rigid social conventions have softened, the solid relationship between people has weakened and it has gradually established a world composed of light, variable, flexible and reversible organizations. This new world, colonized by a neoliberal economy and characterized by sudden changes, generates many problems such as lack of work for young people, social and economic inequalities and mass migration phenomena. This is also called “the fluid society” by Zygmunt Bauman.

A phenomenon that has increased the sense of precarity that characterizes the liquid society of Bauman can be considered the climate change, whose consequences are becoming more and more perceivable in Italy as well as in the rest of the world. In November 2019, Venice’s inestimable cultural heritage suffered huge damages due to the extraordinary height of the tide. Millions of euros were estimated as necessary to repair structures and to cover the missing income of tourism. The situation was so severe that the major of Venice declared a state of emergency. Considering the extraordinary magnitude of the event, the main culprit was climate change. (Henley & Giuffrida, 2020). Between the 26th and 30th of October 2018, several consecutive days of thunderstorms and very strong winds, called "Vaia storm" by meteorologists, caused considerable damage throughout the Triveneto area, affecting, alpine forests of the Dolomites.

Heavy rains and specifically the intense sirocco wind, reached an exceptional speed of 200 km per hour and felled 8.5 million cubic meters of timber. The figure was never recorded in Italy, on an area of 41 thousand hectares of land. Federforeste and Coldiretti have assumed that the total number of trees felled is 14 million. In the entire Triveneto area the estimated economic damage was 2.14 billion euros (Il Post, 2020).

But this is not just an Italian issue, it is a global problem. In December 2019, climate change was the main topic discussed during the UN Climate Change Conference. The conference was about the implementation guidelines of the Paris Agreement at COP 24 in Poland last year. The key objective of the conference was to complete several issues with respect to the full operationalization of the Paris Climate Change Agreement (UNFCCC, 2020). In this continuously changing context, Andrew Zolli and Ann Marie Healy (2012), propose the concept of Resilience as a key factor to overtake sudden, social and environmental alterations.

From the Latin verb “re-salio” which means “bounce back” the terms resilience is widely used in several fields. Within the Material science, Resilience is the ability of a material to absorb a shock without breaking (Accademia Della Crusca, 2020).; In Psychology, Resilience is the ability of the person to react positively to traumatic events (Treccani, 2020), while, in Ecology, Resilience is the ability of an ecosystem to return to its initial state, after a disturbance has occurred. The term “Resilience” has become of common use even in economic disciplines. This is probably due to the increasing frequency with which economic destabilization happens. Especially in Italy, there are everyday cities ruined by economic dislocations or companies which are bankrupt due to globalization and ecological transformations. Changes that alter the native secular lifestyles of small and big communities.

Resilience is becoming increasingly relevant in social awareness because it represents a viable reaction to today's constant mutations in this volatile global economy. Since it is clearly difficult to predict such sudden changes and consequently develop and provide instruments to strengthen societies defences, a strategy that could increase structural resilience of communities is required. Design disciplines are trying to participate in the definition of such a strategy through new approaches, focusing on methods that are not any more merely based on the humanization of technologic solutions. Since one of the main causes of the diminished resilience of society is its liquefaction, the reduction of stable connections, interactions and cooperation between individuals, families, groups, organizations and institutions, design disciplines are called to give answers in terms of projects able to redefine how services and institutions absorb unpredictable disturbances through participation, awareness, solidarity.

Developing resilience means developing skills such as agility, cooperation, connectivity, and variety to prevent crises, stress conditions, and to implement adaptive strategies quickly and efficiently. Our unit is operating in human-centred design research on topics regarding societal issues. We are developing and testing methodological tools and projects in the area of design for sustainability, inclusion and social improvement. Our strategy of intervention is based on three basic concepts: Compatible, Aware and Equal. Compatible: A design that considers the impact of its projects on people’s physical and mental health, trying to foster a lifestyle more compatible with human wellness. A design that aims to reduce the unsustainable impact of human behaviours on communities, society, environment and the

earth's ecosystem. Aware: A design that aims to increase human awareness about the consequences of people's daily choices on themselves, their society and the environment. A design that fosters connection, interaction and cooperation between individuals to increase their awareness and solidarity sense and belonging to communities and society. Equal: A design that aims to create equal opportunities for access to products, services, and systems for the benefit of the largest part of the population beyond physical, cultural, economic, social and any other kind of distinction. A design that aims to increase society's resilience through the empowerment of citizens, providing them new tools and methods for cooperation and participation.

In the following chapter we will expose three of our recent design research projects, different in terms of context, objectives and results but all united by a common strategy and methodology, based on the three concepts previously described. All the projects follow a mix of human centred methodological tools such as QFD, codesign, participative design that is adapted to every case study.

2. The INCEPTION project

Regarding accessibility to cultural heritage and, to the historic buildings – the discussion is often limited to architectural barriers. These constraints represent the traditional attitude of thinking about disability as a personal attribute which is characterized by a reduction of human physiological ability (for example a handicap that limits autonomy and mobility). However, cultural heritage is not only something physical and perceptible but sometimes it concerns also the intangible experience generated by history, art, and culture and associated with the built heritage. Moreover, although ability biases create effective solutions for individuals with similar abilities and circumstances, they exclude a much wider group of people.

As the World Health Organization (2011) reported, it is necessary to consider disability as a complex phenomenon, which regards the interaction between people's bodies and nowadays society features. In this term, it is possible to interrupt the idea of disability as a personal health condition and start to consider disability as a mismatched interaction between people and their own world (Holmes, 2018). From this perspective, these mismatches are more visible today due to technology complexity that produces exclusion to people who are not physically impaired. Therefore, the same mismatched interactions are presented to cultural heritage. As reported by the corresponding author (Mincolelli, 2012), the exclusion to the cultural heritage is produced not only by the building itself but mostly by lack of accessibility to its cultural information: the physical distance, the limited data accessibility, the communication tools inadequacy (due to technical and linguistic reasons) limit the experience of a common cultural heritage to a great part of the European citizens. Regarding nowadays technology, although many potential solutions are available to facilitate access to cultural information, there are several factors that limit digitalization and Cultural

heritage inclusiveness such as resource limitation, the lack of standards and big data management issues.

The first research case was developed to tackle the aforementioned problems. Inception is a multidisciplinary research project coordinated by the Department of Architecture of the University of Ferrara and financed by the European program, Horizon 2020. Its purpose is to enable and promote inclusiveness and accessibility of the European cultural heritage through Information and Communication Technology (ICT), which can increase knowledge, enhancement, and dissemination of its cultural asset and value through the Web (Di Giulio, Maietti & Piaia, 2016). The project followed a Human-Centred approach and Co-Design was used to develop the platform in collaboration with the main stakeholders and users. They not only co-designed the platform, but they also actively participated throughout the entire design process.

In particular, INCEPTION developed an open-standard Semantic Web platform for sharing 3D HBIM models (Building Information Models for Cultural Heritage) to be implemented in user-friendly Augmented or Virtual Reality operable on different digital devices. This specific configuration can catalogue every cultural heritage artefact data (including also context data), which can be subsequently communicated to a wide audience. The aim of this configuration is to make cultural information freely accessible to all (Pauwels, Bod, Di Mascio, & De Meyer, 2013).

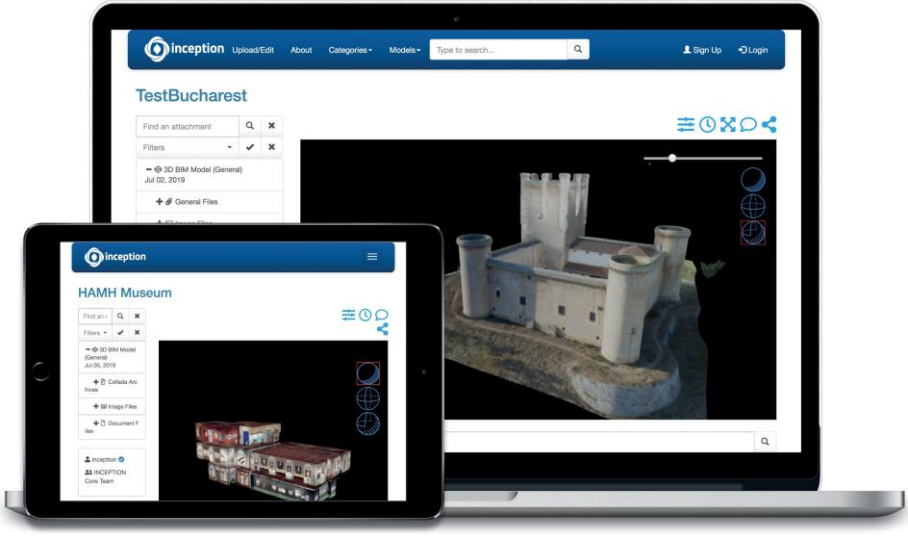

Figure 1. Representation of the beta version of the INCEPTION web platform, which is accessible on different digital devices. In particular, two 3D examples of HBIM models.

Considering these characteristics, the project can be firmly considered resilient under all of the three concepts described in this paper. INCEPTION is intangible and compatible due to its digital nature. Digital technology accelerates the migration from the physical property of a given product to the bits of a virtual experience or service (Anderson, 2009). The physical dematerialization makes INCEPTION accessible and on-demand to all, decentralizing at the same time its system through a ubiquitous communication generated by the Web (Kelly, 2016). Furthermore, this process makes accessibility to cultural heritage easier and stronger. In fact, the 3D model properties can be elaborated and processed without running the risk of distorting the original configuration of the historic buildings.

Digitalization makes INCEPTION also equal because the platform is designed to be accessible and open source to all. In fact, a versatile service adapts itself to the numerous people categories, from the expert necessities to the common citizen's needs. Linguistic or cognitive barriers – in terms of perception, navigation or cognition of virtual information (Thatcher et al., 2006) – can be overtaken by the User-Centred Design approach because it allows finding inclusive solutions that accommodate those needs, capabilities, and ways of behaving (Norman, 2014).

Finally, INCEPTION is also aware because is participative starting from its development. Digital media, indeed, are able to support people's cultural actions (Manovich, 2013), such as accessing and elaborating knowledge; sharing or remixing information; engaging in interactive cultural experiences to visualize digital contents. Regarding inception, those operations can be performed by people directly on the INCEPTION platform. The cultural heritage is available for all European citizens in an interoperable way, in which people can interact or work with the HBIM models in different levels of details: download or upload its files, gain or enrich the information of every 3D source, or simply explore it corresponding documentations. Moreover, since every digital model maintains all the technical and historical information of its corresponding building, INCEPTION acts as a huge digital archive for the safeguard, for the restoration, and the reconstruction of every built heritage. This including the last extreme case of the fire-damaged Notre Dame cathedral in Paris (Agency Research Executive, 2019). For this reason, all the interactions with the platform are capable to increase people's personal knowledge about the European cultural identity on people (Maietti et al., 2017), stimulating them to be more participative and active in preserving it over the time.

2. The HABITAT project

Another project carried out by the research team was the project HABITAT (Home Assistance Basata sull'Internet of Things per l'Autonomia di Tutti): the project was financed within the POR FESR 2014-2020 program of the Emilia Romagna Region in Italy, which started in April 2016 and ended in July 2018. The multidisciplinary team that developed the project was composed by the by the CIRI-ICT group (Centre for Industrial Research of the University of

Bologna which specializes in radio frequency systems) who was the leading partner in the research; CIRI-SDV (Life Sciences and Health Technologies of the University of Bologna who are experts for the technical validation of inertial sensors.

Figure 2. The Habitat project prototype and test with elderly users.

The HABITAT project aims to develop and test a platform based on the Internet of Things for the realization of adaptive and supportive living environments. The members of the research team developing the part of the project related to Design Research decided to apply a design methodology that could ensure a high level of usability, accessibility, and inclusiveness (Mincolelli et al., 2019). The final choice was the application of the User-Centred Design approach, also known as UCD (International Organization for Standardization, 2010), the reason of that option was linked to the main objective of the project itself: the development and testing of a platform composed by smart objects with a TRL - Technology Readiness Level (Mai, 2017) of 5 (that means that the prototypes were expected to be tested in a natural environment and not in a laboratory; the starting point of the technologies used for the project was a TRL of 3rd grade, also known as proof of concept) and, at the same time, the integration between technological aspects and human factors.

The chosen approach, which is characterized by a multi-level problem-solving process, allowed the research team to analyse and predict how the user would interact with the final products, and also to verify and validate the research contents and the design development (Mincolelli, 2008). Given the specificity and the peculiarities of the different users involved in

the project, it was important to set up a research methodology that would allow the optimization of the characteristics of the domestic ecosystem by developing an open, flexible and customizable platform that could change its behaviour according to the needs of the individual person (Mincolelli, Marchi & Imbesi, 2017).

The HABITAT project consisted in designing, prototyping and testing a home ecosystem composed of objects with natural interfaces but equipped with sensors governed by Artificial Intelligence, able to improve the user's self-sufficiency and capable of facilitating an active ageing for older people, without forcing them to face the difficulties related to the learning of new interfaces and communication systems using the Internet of Things. Those daily objects were supposed to ensure a high level of usability, ergonomics, and inclusion through the creation of customized profiles based on the analysis of the needs of each individual person (Imbesi & Mincolelli, 2020). The system also allowed to catch, elaborate and monitor a series of data for the analysis of the quality of ageing, in the short, medium and long term.

The HABITAT project can be defined as "compatible" because it tries to analyse how daily activities of the users can be modified, in order to consent healthy ageing for them that can directly and indirectly positively impact to other people and to the whole society. It was "aware" because it allowed primary users, secondary users and stakeholders to understand how the elderly's quality of life can have significant consequences on the community and on the environment. Lastly, it was "equal" for its inclusivity that aims to give the same opportunities and the same level of usability and accessibility for products, services, and systems to the largest number of users, including the ones belonging to niche categories needing special requirements.

3. The PLEINAIR project

The team is carrying out another research regarding the PLEINAIR project. The project started in July 2019, will last 2 years and is funded under the action 1.2.2 POR FESR 2014-2020 of the Emilia Romagna Region. One of the problems (Ministero della Salute, 2017) the world population is facing is the sedentary lifestyle; this aspect has negative and concrete consequences on multigenerational users: from children to the elderly. At the international level, it is estimated that one adult in four (aged between 18 and 69) and three out of four teenagers (aged between 11 and 17) do not do any type of physical activity or exercise, as recommended by the WHO. In Europe, according to the WHO, the sedentary lifestyle causes every year one million deaths (about 10% of the total).

The project team has identified one of the possible solutions to reverse this constant and dangerous drift: sharing and realizing better lifestyles to improve people's quality of life, social and recreational activities for greater physical activity. These are the reasons why the INCEPTION project has been developed: Free and Inclusive Parks in Networks for Recreational and Physical Intergenerational Activity.

Figure 3. System general layout of the PLEINAIR project

Usually one of the weaknesses of the existing playgrounds is the one of being very sectorial; Such playgrounds meet only the needs of specific users. There are beautiful playgrounds for children, modern skate parks for teenagers or life paths for the elderly but, it is difficult to see a park that simultaneously targets multi-generational users. Parks where the child can play, collaborate and deal with different users, such as the elderly and adults. Even if in different contexts, there are already best practices (International Child Development Initiatives, 2012) that prove how sharing heterogeneous activities by different users can widely benefit all the users involved.

PLEINAIR is made up of a highly specialized scientific-industrial research team: the partners TekneHub and A.I.A.S.have cultural and methodological skills aimed at the Human-Centered Design approaches. DataRiver, CIRI SDV and Future Technology Lab have proven competencies in the sector of IoT/IoMT, sensors, as well as data management, Machine

Learning/Artificial Intelligence. The industrial partners – that are important for their skills in terms of industrial and experimental operation – are Ergotek s.r.l. (wooden seats and furniture), Sarba s.p.a (playground equipment and urban furniture), mHealth Technologies S.r.l (healthcare furniture sector). The main goal is to create playgrounds and inclusive contexts in order to carry out outdoor socio-recreational activities. A context that can adapt to the needs and necessities of each person, personalizing the interface with targeted motivational strategies. To achieve this objective, the team plans to develop and create the Outdoor Smart Objects (OSOs): auxiliary objects or ludic tools equipped with actuators and sensors that detect important parameters for a correct and healthy lifestyle. The network of possible solutions is wide and open, as the adaptation through the auxiliary objects will occur thanks to the development of distributed artificial intelligence within the OSOs.

The project is ongoing and follows design research approaches and methodologies aimed at satisfying people's needs. Users (understood in the broadest sense) have been and will be constantly and frequently involved in the research. During participatory working days, tools such as the co-design will be applied in order to plan and design together with the users. Therefore, the project is permeated by the concept of resilience.

PLEINAIR is definitely a Compatible and Equal research project: the signals that gave birth to and think about the project are closely linked to concepts concerning people's health and lifestyle; improving the – physical, social and inclusive – the quality of the surrounding environment in order to raise people's quality of life. The objective of PLEINAIR is the development of OSOs that allow creating inclusive contexts in which people of different ages, skills, cultures, sensitivity, and abilities can carry out recreational-social activities together, without physical, cognitive or social barriers.

The research is certainly Aware: one of the strengths of the constant and systematic use of Human-Centred Design methodologies (such as the co-design) is to trigger an emotional bond with people from the first phases of the research; thanks to this "trigger" it is credible to be able to make people more aware of both their needs and the shortcomings (or not) of the surrounding environment. One of the most significant problems we are experiencing, especially within Public Administrations, is the one regarding the management and maintenance of the park. Being able to design a context together with the people belonging to the neighbourhood community where the park is located, can create inclusive and virtuous dynamics for its good maintenance. Involving people and making them active actors within the strategic choices for the realization of a park, crucially increases their responsibility on the context conceived all together.

4. Conclusion

Within the context of climate change and fluid society, the impact of our approach in design research is aiming to improve every day's life quality in terms of awareness, compatibility, and equity. To clarify the connection between the projects INCEPTION, HABITAT, PLEINAIR

and the resilience in terms of equity, awareness, and compatibility the Table 1 has been done.

Table 1. Conclusive Table with relationships between projects presented and the concepts of equity, awareness and Compatibility.

	INCEPTION	**HABITAT**	**PLEINAIR**
Equity	Accessible to all, remove linguistic barriers by means of HCD.	Does not leave behind fragile categories but encourage social and inter-generational inclusion	The project aims to create recreational-social activities together, without physical, cognitive or social barriers.
Awareness	Promotes awareness of the territorial identity	Promote awareness of elderly's life quality and the impact on the society among primary, secondary users and stakeholders.	Human-Centred Design methodologies (such as the co-design) trigger an emotional bond with people and stakeholders involved.
Compatibility	Digital and intangible	Promote healthy ageing for a positive impact on society	Improve the quality of the surrounding environment

Projects such as INCEPTION, HABITAT, PLEINAIR are intended to foster a resilient culture that helps to preserve the territories' integrity and society's sustainability and empower citizens through their communities and pass this empowerment on to future generations. Each project enhances a resilient culture on a different level: HABITAT promotes a resilient, inclusive society that does not leave behind fragile categories such as the elderly, but rather encourages them to be active and autonomous within their limits and taking advantage of a dignified and sustainable help provided by the society they belong to. PLEINAIR is instead focused not only on fostering a healthy and active lifestyle of individuals, but also on encouraging dialogue and closeness between different generational groups, increasing connections and interactions between citizens of different ages. Finally, INCEPTION not only represents a participatory strategic tool to create a crowd-based backup of data useful in an emergency (as in the case of the fire of Notre Dame in Paris) but it also promotes awareness and understanding of the territorial identity.

Dive deep into the design research and into the human-centred design, the resilient approach is not only useful to improve everyday life but also to promote a sustainable progress of the society. Promoting equity, awareness, and compatibility not only can contribute to grant a sustainable development of human society through the design of products, services and institutions, but also by encouraging individuals to consider and adopt

behaviours that empower their community. Design research for promoting resilient culture can represent an alternative perspective, a counterbalance to the diffusive consumeristic and individualistic mindset that can be considered the greatest danger for an equitable and united society.

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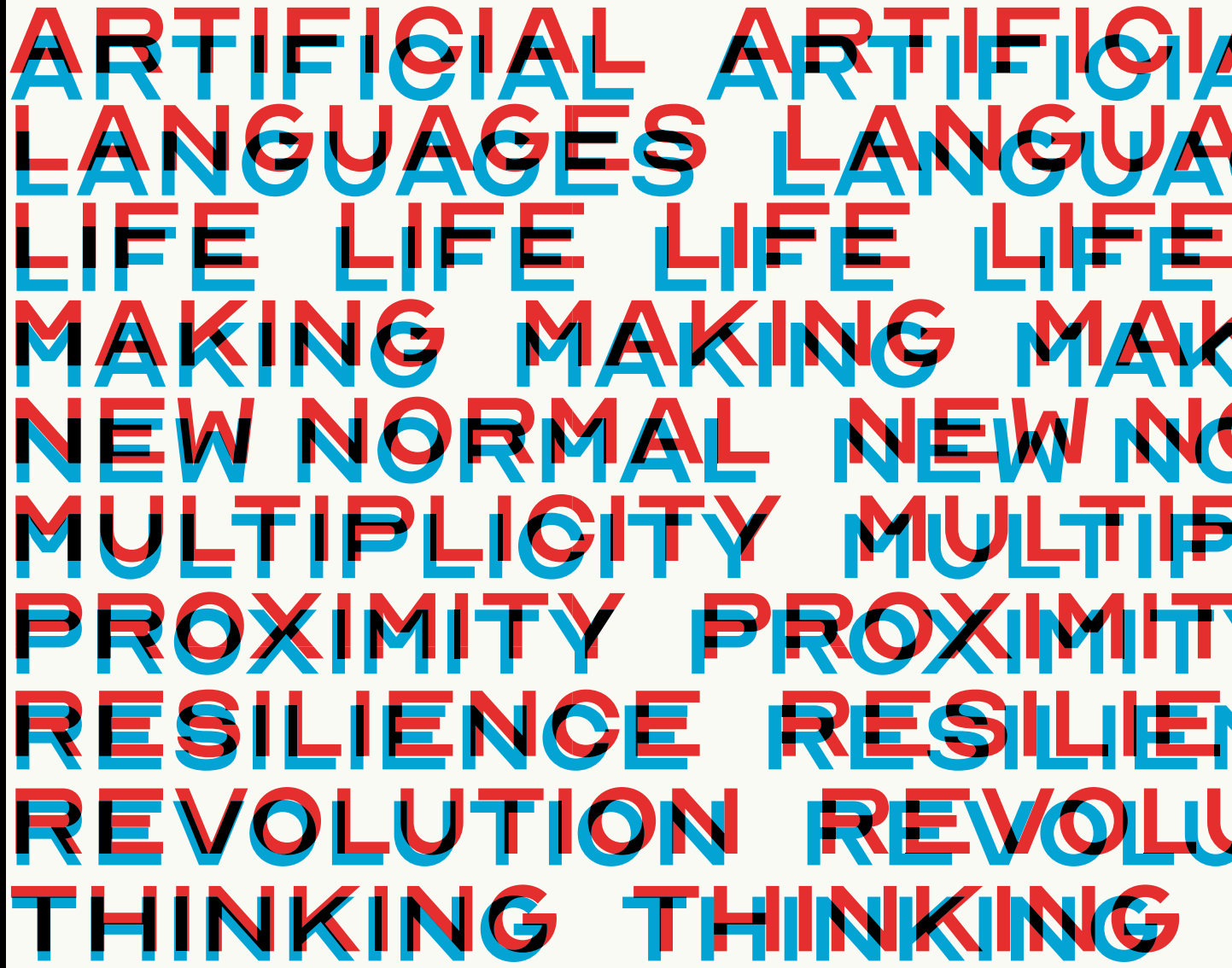
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