



CUMULUS CONFERENCE PROCEEDINGS SERIES

MONTERREY 2024

UDEM | UNIVERSIDAD
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Tecnológico de Monterrey
Escuela de Arquitectura,
Arte y Diseño

DESIGN | ACROSS BORDERS
UNITED | IN CREATIVITY

Cumulus conference: Design Across Borders - United in Creativity

Co-hosted by the Universidad de Monterrey (UEM) and the Tecnológico de Monterrey (Tec)
Monterrey, Mexico, on October 16-18, 2024

Conference website: <https://cumulusmonterrey2024.udem.mx/>

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

<https://cumulusassociation.org/>

ISSN 2490-046X

ISBN 978-952-7549-06-3 (pdf)

No. 13 Cumulus Conference Proceedings Series

Editor-in-Chief: Cumulus President Lorenzo Imbesi

Editors: Alessandra Perlatti

Publications in the Series:

01/17 Kolding, REDO

02/17 Bengaluru, Letters to the Future

03/18 Paris, To get there: designing together

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13/25 Monterrey, Design Across Borders – United in Creativity

Design Across Borders: United in Creativity.

Cumulus Conference Proceedings Monterrey 2024

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Preface

In a world shaped by constant transformation and global interconnectedness, design emerges as a bridge between people, places, and ideas. Cumulus Monterrey 2024: Design Across Borders – United in Creativity invited the international design community to reflect on the profound potential of design to transcend cultural, geographic, and disciplinary boundaries, uniting us in the shared pursuit of innovation, inclusion, and positive change.

This edition of the Cumulus Proceedings gathers contributions that respond to urgent questions: How can design foster empathy and intercultural understanding? In what ways does it become a catalyst for social transformation in a complex, globalized world? Can design truly become a universal language—and what are the challenges in achieving that ideal?

The richness of perspectives represented in these proceedings speaks to the global nature of the Cumulus network. Authors, researchers, educators, and practitioners from across continents have come together to share insights, experiences, and provocations within four thematic tracks:

- Design for Change explores design's role in social innovation, sustainability, equity, and the circular economy—highlighting projects that place co-creation and inclusion at their core.
- Speculative Futures ventures into emerging territories shaped by technology, artificial intelligence, and immersive experiences, imagining the future of creative practice.
- Education in Art and Design focuses on pedagogical innovation, interdisciplinarity, and the challenges and opportunities of digital transformation in global learning environments.
- Translocality brings critical attention to issues of migration, decolonization, and the Global South, recognizing the importance of diverse voices and perspectives in shaping a more equitable world through design.

Together, these contributions reflect a collective commitment to harnessing creativity as a force that transcends barriers—linguistic, political, cultural—and brings people together around shared values and visions.

We are proud to present this volume as a testament to the power of design to imagine, inspire, and unite. May it serve not only as a record of this important moment in time but also as a spark for continued dialogue, collaboration, and transformation in the global design community.



Design Across Borders: United in Creativity

Lorenzo Imbesi

Full Professor, Sapienza University of Rome

President, Cumulus Association

The Cumulus Monterrey 2024 Conference marked a timely and vital moment in the global conversation about the role of design in shaping a better world. Hosted at the prestigious design institutions of Tecnológico de Monterrey and Universidad de Monterrey (UEM), the international gathering has been further enhanced by the unique Monterrey's rich heritage and cultural identity, contributing to a thriving ecosystem of creative exchange for scholars, researchers, and practitioners across various design disciplines.

The central theme of the conference, "Design Across Borders: United in Creativity," provided an inspiring gateway for exploring how design holds the possibility to transcend geographical, cultural, and disciplinary boundaries. In particular, the conference was framed by four imperative trajectories: "Design for Change," investigating how design practices can drive social innovation and sustainable development; "Design Futures," exploring the interplay between technology and creativity, immersive experiences, virtual realities, and the implications of artificial intelligence; "Education in Art and Design," investigating pedagogical approaches in the field; and "Translocality," addressing complex issues of migration, decolonisation, and North-South dynamics. Themes highlight the broad scope of contemporary artistic and design pursuits.

At the heart of the conference was a shared recognition that design can be a dynamic force for empathetic understanding and intercultural dialogue. Through a rich program of keynote lectures, panel discussions, workshops, exhibitions, and informal exchanges, the international community demonstrated determination to work collaboratively across geographical and cultural divides, confirming the foundational premises of the conference: that creativity knows no boundaries, and through design, we can forge connections that transcend the limitations of space, time, and cultural difference. In an era of unprecedented global challenges, from climate change to technological acceleration, from cultural conflicts to social inequities, designing without boundaries means identifying areas of commonality, intersection, and convergence, highlighting them in ways that resonate with and reflect the spirit of our transborder region. As traditional confines between nations, disciplines, and cultural contexts become increasingly permeable, the design community must find itself uniquely equipped to harness this fluidity. Rather than resisting uncertainty, design must embrace it, transforming constraints into opportunities for innovative problem-solving and cross-cultural exchange.

The proceedings collected in this edition offer an extensive variety of perspectives on the ideas and projects discussed at the event. They include case studies, speculative work, educational reflections, and practical strategies, all pointing to the evolving role of design to shape societal interactions, encouraging intercultural dialogue, and building a more harmonious and interconnected world. However, these proceedings capture only a portion of the energy and insight shared during the conference, with the remaining impact continuing to reverberate through ongoing collaborations and dialogues within our global community.

As we move forward, the conversations from Cumulus Monterrey 2024 remind us that creativity thrives not in isolation, but in community. And in a time marked by division and uncertainty, design, when practiced with care and intention, can truly serve as a bridge. One that brings us together to learn, to act, and to imagine a positive change.



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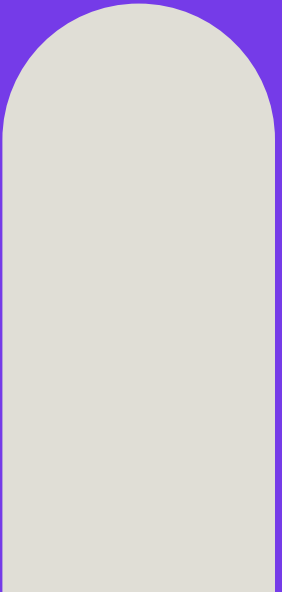
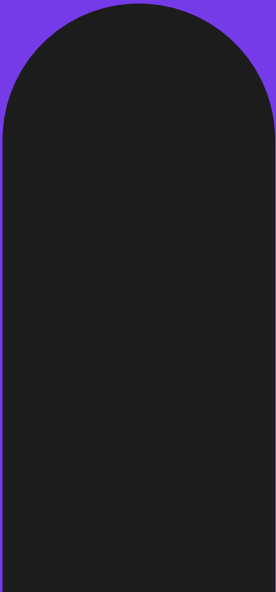
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ONLIFE. EXHIBIT DESIGN IN THE TIME OF THE MANGROVE SOCIETY.

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ABSTRACT | The paper focuses on onlife exhibit design, a design mode in which digital technologies, Artificial Intelligence and the Internet of Things, are integrated with exhibition design strategies that enable the interconnection of physical and digital spaces, trying to outline new innovative approaches by understanding how Extended Reality (XR) can create new levels of interaction between exhibit and visitor. Designing exhibits with an onlife perspective would create a circularity between the different interaction contexts: generating not only “enriched” paths for the public, but creating temporary exhibitions that thanks to “the introduction and technological advancement related to the diffusion of new technologies make it possible to experiment new levels of interactivity and involvement of visitors in the exhibition spaces” (Del Puglia S. 2022) An exhibition today is a conscious spatial arrangement of a more or less coherent set of objects which, on the basis of more or less succinct selection criteria, will enter into a documentary interrelation for the duration of the event. This interrelation, according to the intentions of the book *Narrative Spaces*, “will produce a cohesive narrative potential capable of giving the whole its expressive power and clearly addressing the audience. Other perspectives may of course be valid, but since the exhibition is the result of an interdisciplinary effort, we opted for a formula that involves all parties involved in the realisation of exhibitions, regardless of the conventions of the profession or the various backgrounds of the experts in the field. In this way, it is intended to establish a common central position that, for the sake of the medium itself, will push the boundaries and lead to greater collaboration between disciplines”. (H. Kossmann, S. Mulder, F. den

Ousten, 2012) In order to investigate how the technologies is changing our lives, the philosopher Luciano Floridi coined the word Onlife, a neologism that serves to indicate that in most industrialised societies there is a fusion of online and offline, digital and physical. "These are not two distinct worlds but two inextricably intertwined layers that inevitably have strong repercussions on experience design as well." (Floridi L., 2017)

Since 2004 Dotdotdot has been investigating and implementing strategies to create true experiential exhibitions, refining project after project their digital know-how in the service of storytelling; consolidating an approach to exhibition design and digitalisation by outlining new paradigms and proposing innovative types of storytelling and visitor experience. In Italy there are a multitude of small realities, such as archives, which through digital exhibitions can become an important means and resource to tell their story, their connection with a territory, their research activities and transformations that, without digital technologies and Interaction Design, would remain inaccessible. The ambition is to demonstrate how new technologies and communication methods can showcase any type of subject matter, making it accessible and comprehensible to everyone. By providing a more in-depth and focused contribution to the field, for find a new approach for emphasizes the potential to amplify the value of exhibition content. It confirms that experience and interaction are indispensable elements in the creation and successful engagement of an exhibition.

KEYWORDS | DIGITAL, ONLIFE, TECHNOLOGIES, EXHIBIT, NEW MEDIA



1. Redefining experience: the intersection of real and virtual spaces in post-pandemic design

The need to investigate at a critical and design level aspects of the multiplicity of bodies and spaces and their interactions stems from Maldonado's reflection on the meaning of the word virtual and the relationship between real and virtual space. « He seeks the meaning of illusory reality, in which man produces images that he deludes himself into believing to be real. A practice that goes back to primitive man's ability to depict symbolic worlds rather than a novelty triggered by technological progress »¹. (Maldonado T., 1992)

The sudden push of the Covid-19 pandemic updates the theme by bringing our physical bodies into virtual spaces for interaction. The field of post-pandemic exhibit design has sought to understand the ongoing change and

develop new designs without sacrificing the value of experience. To enable a clear reading of this, philosopher Luciano Floridi coined the word Onlife a neologism that serves to indicate that in most industrialised societies there is a fusion of online and offline, digital and physical. « These are not two distinct worlds but two inextricably intertwined layers that inevitably have strong repercussions on experience design as well ». (Floridi L., 2017). Hsin-Chien Huang, an internationally renowned artist specializing in the creation of immersive content and artworks that combine virtual reality, interactive elements, performing arts, and installation art, to better define his approach to art and new media, during the conference held on November 9th at the MEET Digital Culture Center in Milan, briefly presented the history of digital tools, highlighting how the technological and communication sectors have shifted from a storytelling-focused rhetoric to what he calls « story-living ». Hsin-Chien Huang thus focused

¹ Maldonado, T. (1992). *Reale e virtuale*. Milano: Feltrinelli.

² Floridi, L. (2017). *La quarta rivoluzione: come l'infosfera sta trasformando il mondo*. Milano: Raffaello Corona Editore.

on how the distance between viewers and digital content, and hence the screens, has shortened, from 4-5 meters in cinemas, to 15-20 centimeters with smartphones, down to 2-3 centimeters with VR headsets. He emphasized how this change is related to the increasing level of interactivity demanded by users. « People no longer want to be spectators », explains the artist, « they want to be closer to the content they consume, they don't want to just hear a story, they want to be part of it, to participate in it. For this very reason, in my work, I use new media and virtual reality to define an artistic and narrative experience where interaction absorbs the reader's thoughts and memories, as if they were playing a video game, thus making them the protagonist of the story, a part of the Art itself »³.

2. Bridging worlds: the role of bodily presence in onlife exhibitions

The 'onlife' exhibition mode represents a crucial development direction for the future. Through careful planning and development, an onlife exhibition can contextualize cultural objects, including those impossible to display physically, to communicate through a tailor-made narrative. A key element to consider is the concept of 'sense of presence,' which plays a key role in generating a strong

connection between people and the virtual environment. Unlike the traditional physical exhibition space, where exhibitions were predominantly static, the digital environment offers an enhanced experience to the public. Maurice Merleau-Ponty, a phenomenological philosopher, placed significant emphasis on the importance of bodily experience in acquiring knowledge and perceiving the world around us. In his main work, *Phenomenology of Perception*, Merleau-Ponty argues that « the body is not simply an object in the world, but rather the instrument through which we experience and understand the world itself »⁴.

According to the author, our experience of reality is intrinsically linked to our bodily experience, to "gestures," as it is through our senses and bodily perceptions that we come into contact with the surrounding environment. Consequently, the body acts as the bridge between our consciousness and the external world, becoming our « first and last reality » as it is the foundation upon which all our experience and understanding of the world are based.

The concept outlined by Merleau-Ponty is particularly relevant in the context of communication and art as it emphasizes the importance of considering the body as an integral part of the design process and, therefore, of understanding the content.

³ Rossi D. (2023). *Hsin-Chien Huang, il media guru che coniuga il gaming con la cultura taiwanese*. Retrieved November 13, 2023, from [hHps://www.ellededor.com/it/tech/metaverso/a45818890/hsin-chien-huang-storia-opere/](https://www.ellededor.com/it/tech/metaverso/a45818890/hsin-chien-huang-storia-opere/)

⁴ Merleau-Ponty M. (2003). *Fenomenologia della Percezione*, Feltrinelli, Milano, p.120

Nicolas Bourriaud, French art critic and philosopher, argues that « gestures are not only means of individual expression but also tools for creating connections and meaningful relationships between artists, artworks, and the audience »⁵. It is well known that the chosen medium for communication is not simply a vehicle for transmitting content, but profoundly influences the way the content itself is perceived and interpreted, as Marshal McLuhan, a sociologist and author famous for his statement « the medium is the message »⁶ asserts. If we apply this theory to the concept of “gesture” in the context of exhibit design, we can consider the human body both as an actor, in the case where the visitor is called to actively participate in an action, and as an audience, when it becomes merely a spectator of an activity that conveys meaning. In both cases, the “gesture” becomes a carefully designed element to foster meaningful interaction with the content of the event.

With the advent of the Internet, not only has the approach to exhibition design changed, but there has also been a questioning of the value of the exhibition venue. In the past, the location was simply a frame for the exhibition, but now it becomes not only a container but also a content that interacts and connects with both the audience and the exhibition and the object itself.

to redefine cultural spaces to adapt them to the social and economic context of the coming years. This challenge can be addressed through the new design approach of Exhibit Design Onlife. The digital environment offers the opportunity to make cultural content accessible in innovative ways, thanks to immersive strategies and immersive technologies such as artificial intelligence (AI), augmented reality (AR), mixed reality (MR), visors, interactive displays, dynamic lighting, eye-tracking, stimulating visitors through entertainment, education and training, taking advantage of new technological resources. In addition, the digital integration of temporary exhibitions enables seamless circular experiences: the experience can start at any point and continue without interruption, offering the public richer experiences. Today, studios such as Dotdotdot, Art+com, and AKQA are recognized as leaders in interactive, immersive, and digital exhibit design. Their work demonstrates how to create truly interactive exhibits and experiences by leveraging new technologies and tools to support storytelling. These studios effectively create synergies between tools, content, and visitors

⁵ Bourriaud N. (1998). *Esthétique relationnelle*, Les Presses du Réel, Parigi, p.87 - in Merleau-Ponty M. (2003). *Fenomenologia della Percezione*, Feltrinelli, Milano, p.168

⁶ Cfr. McLuhan M. (2023). *Gli Strumenti della Comunicazione*, ilSaggiatore, Milano, [McLuhan M. (1964). *Understanding Media: The Extensions of Man*, McGraw-Hill, New York]

3. From physical to digital: how technology is shaping the future of cultural exhibitions

The research in this work is essential and the inspirations come from many directions, from the world of art to the world of technology, and of course design and architecture. The advent of technologies and innovations has not erased the physical vision of temporary exhibitions or museums, but rather added to it a digital space that is complementary to them, providing technologies and services to enhance the visitor experience, creating an alternative space in which the various cultural actors can interact with each other (Teece, 2018)⁷. These are exhibitions that put the viewer at the centre, no longer the work of art, focusing on arousing emotions and involving the viewer in all his senses. They are therefore easy to enjoy, and involve a broader segment of viewers. With immersion and interaction tools, in which the visitor is immersed in a new world, in which works of art are projected onto the walls, ceilings and floors of museum rooms, accompanied by audio narratives or matching music. Today, technology is a presence taken for granted when enjoying exhibitions, but if the use does not meet our expectations, we are disappointed. Since 2004, the Italian-based studio Dotdotdot has been investigating and implementing strategies to create true experiential exhibitions, refining their digital know-how project after project in the service of storytelling.

They have consolidated an approach to exhibition design and digitization by outlining new paradigms and proposing innovative types of storytelling and visitor experiences.

Dotdotdot emphasizes, “we design innovative human experiences”. In Italy, there are a multitude of small realities, such as archives, which can become important means and resources through digital exhibitions. These digital platforms enable them to tell their stories, showcase their connection with their territories, and highlight their research activities and transformations, which would remain inaccessible without digital technologies and interaction design. The incorporation of new technologies into the promotion of culture, the on-site experience, and the approach to exhibition design has fundamentally transformed how exhibitions are conceived, presented, and experienced. These advancements have expanded the reach and impact of cultural institutions, making art and culture in general more accessible and engaging for a diverse audience. By embracing digital innovation, exhibition designers can create more interactive, immersive, and memorable experiences that resonate with visitors and foster a deeper appreciation of culture. The application of new technologies has predominantly revolutionized three different areas: the promotion of culture, the on-site experience, and the approach to exhibition design.

⁷ Teece D.J. (2018) *ProfiAng from innovaAon in the digital economy: enabling technologies, standards, and licensing models in*

4. Digital transformation in exhibition design: enhancing cultural promotion, on-site experiences, and design approaches

4.1 Promotion of Culture

In the realm of exhibition design, the promotion of culture has been profoundly transformed by digital technologies. Museums and galleries now leverage social media, virtual tours, and interactive websites to attract and engage a global audience. Digital platforms enable institutions to showcase their exhibitions far beyond their physical locations, reaching audiences who might never visit in person. As Alessandro Baricco aptly puts it, « The challenge today is to build experiences, not just to provide information »⁸. This shift underscores the importance of creating engaging and memorable cultural experiences through digital means.

Virtual tours, for instance, can offer a preview of exhibitions, enticing potential visitors to experience them physically. Additionally, social media campaigns can highlight key exhibits, share behind-the-scenes content, and facilitate online discussions, thus

generating buzz and fostering a deeper connection with the audience. Matthew Ball, a leading thinker in the digital space, notes that « the virtual world can extend the life and reach of physical exhibitions »⁹. This digital outreach not only amplifies the cultural institution's visibility but also creates a dynamic and interactive platform for cultural promotion, making art and history more accessible and engaging.

“Ore Streams” is an ambitious investigation into the recycling of electronic waste developed by Formafantasma over the course of three years. First as a commission at the NGV2 Triennial in Melbourne in 2017, curated by Ewan Mc Eoin and Simone Le Amon, and then in 2018 for the XXII Triennale ‘Broken Nature’, curated by Paola Antonelli (senior curator of Architecture and Design at MoMA in NY). It uses a diversity of media (objects, video documentaries, and an animation) to address the topic from multiple perspectives, and reflect on how design could be an important agent for more responsible use of resources¹⁰. In the case of this study, the theme “sustainability” as the theme of exhibition is represented by the figure of the designer which is evolving, oriented towards the concept of ecological transition.

⁸ Baricco A. (2018); *The Game*, Torino, Einaudi Editori.

⁹ Ball M. (2022); *Metaverso - cosa significa, chi lo controllerà e perché sta rivoluzionando le nostre vite*; Milano, Garzan>, 2022 the wireless world, Research Policy, 47(8). DOI: <https://www.sciencedirect.com/science/article/pii/S0048733318300763> (open access).

¹⁰ Valenti A., Trimarchi A., Farresin S. (2023); *Design e pensiero Ecologico*; in *Agathon* n.13, pag. 19-30.

(<https://www.agathon.it/agathon/article/view/342/376>)

A dynamic in continuous movement, as Andrea Trimarchi and Simone Farresin argue that the concept of transition is stimulating because it represents a condition of continuous change, which reflects how we should live today (2022). Humans have mined the Earth's surface for millennia in search of metals and minerals to fulfill production demands. In fact, forging metal changed the course of history: bronze empowered humans to weaponize, and gold facilitated local, then global, trade. At this very moment, new cavities are being hollowed out, while existing excavated sites are abandoned or refilled with new Earth – a superficial recompense. By 2080, the most significant metal reserves will not be underground but above the surface, as ingots stored in private buildings or otherwise circulated within products such as building materials, appliances, furniture, and consumer electronics. Imagining the future, what would archaeologists of tomorrow think of our era if they were to explore the sites of our current cities? They would encounter numerous landfills filled with waste, as argued by Marianna van Helvert¹¹ (2019). The eighteen channel Ore Streams video installation aims to offer global strategies for the design of

products that lend themselves to more efficient repair and recycling. It includes a series of interviews the Studio conducted with practitioners in the recycling sector, including European e – waste recyclers, academic researchers, electronics producers, NGOs working in developing countries, and members of Interpol. The installation also includes a video collecting historical and contemporary examples of planned obsolescence in electric and electronic objects at the centre of class – action lawsuits. One video explains recycling systems and technologies for sorting waste, and two videos show a selection of electronic products being carefully disassembled and recomposed. In the animation, Formafantasma uses 3D rendering to visualize possible strategies to improve repairing and recycling¹².

¹¹ Van Helvert M. (2019). *The Responsible Object: A History of Design Ideology for the Future*. Berlin, Valiz, pag. 220. ¹² Valen> A., Trimarchi A., Farresin S. (2023); *Design e pensiero Ecologico*; in *Agathon* n.13, pag. 19-30. ([hHps://www.agathon.it/agathon/ar>cle/view/342/376](https://www.agathon.it/agathon/article/view/342/376))

¹² Teece D.J. (2018) *Profi>ng from innova>on in the digital economy: enabling technologies, standards, and licensing models in the wireless world*, *Research Policy*, 47.

4.2 On-Site Experience

The on-site experience of exhibitions has undergone a significant transformation with the integration of Digital technologies in exhibition design. Interactive displays, augmented reality (AR), and virtual reality (VR) have revolutionized how visitors interact with exhibits. For instance, AR can overlay historical context onto artifacts, providing deeper insights and a richer understanding. According to David Teece, « Technological advancements are not just tools, but enablers of new ways of thinking and experiencing»¹². This highlights how AR and VR can immerse visitors in historical events or artistic environments, creating an experiential narrative that goes beyond traditional static displays. Interactive touchscreens and multimedia installations allow visitors to engage with content in a hands-on manner, making the learning experience more dynamic and personalized. These technological advancements ensure that the on-site experience is not only informative but also immersive and memorable, enhancing visitor engagement and satisfaction. The ability to tailor experiences to individual preferences and learning styles makes the exhibition more inclusive and appealing to a broader audience.

The ArtScience Museum of Singapore, in 2019, for example, has designed an immersive experience and interactive exhibition based on stunning content from “Our Planet”, a new Netflix original documentary series, created in partnership with the World Wide Fund for Nature (WWF). “Our Planet” is an eight-part documentary series from the team behind “Blue Planet” and “Planet Earth”, released on 5 April 2019 on Netflix, filmed over four years in 50 different countries. The exhibition “REWILD Our Planet” then uses cutting edge technology to transport you into the landscapes featured in this ambitious documentary. At the exhibition at ArtScience Museum, people were able to dive into the deepest oceans, visit the most remote forests and take a journey over vast ice caps. Blending stunning IMAX style projections with spatial soundscapes and a soundtrack. This is Singapore’s first Augmented Reality social experience which allows multiple visitors to interact with digitally-created environments, whilst examining how climate change impacts all living creatures¹³.

¹² Teece D.J. (2018) Profiting from innovation in the digital economy: enabling technologies, standards, and licensing models in the wireless world, Research Policy, 47.

¹³ Cfr. Rewild our planet (2019) Comunicato stampa. URL <https://www.marinabaysands.com/museum/rewild-our-planet.html> 15 Baricco A. (2018); The Game, Torino, Einaudi Editori.

4.3 Approach to Exhibition Design

The approach to exhibition design itself has been revolutionized by new media technologies. Designers now have access to advanced tools and software that allow for greater creativity and flexibility in planning and executing exhibitions. Projection mapping, for instance, can transform ordinary spaces into dynamic, immersive environments that change in response to the narrative being presented. Alessandro Baricco's concept of « narrative intelligence »¹⁵ is highly relevant here, as it emphasizes the need to weave compelling stories that resonate with the audience through innovative use of technology. It plays a crucial role in the modern approach to exhibition design. Baricco posits that narrative intelligence is the ability to understand, create, and use stories to make sense of the world around us. This concept extends beyond traditional storytelling, encompassing the use of narratives in various forms of media and communication to engage and educate audiences. In the context of exhibition design, narrative intelligence involves crafting a cohesive and compelling story that ties together the various elements of an exhibition¹⁴. This can include the physical artifacts, digital displays, interactive elements, and overall thematic structure. By weaving these components

into a unified narrative, designers can create a more immersive and emotionally resonant experience for visitors. Baricco emphasizes the importance of creating narratives that are not only informative but also emotionally engaging, as this connection can significantly enhance the impact of an exhibition. For example, in a historical exhibition, narrative intelligence might involve creating a storyline that follows the journey of a particular individual or community, using artifacts, multimedia, and interactive displays to bring their story to life. This approach helps visitors to connect with the material on a personal level, making the history more relatable and memorable.

Interactive installations and responsive environments engage visitors in new and innovative ways, creating a participatory experience. Furthermore, the use of digital tools in the design process enables detailed simulations and virtual walkthroughs, allowing designers to experiment and refine their concepts before implementation. As Teece suggests, « Digital tools are not just for creation but also for continuous iteration and improvement »¹⁵. This digital-first approach not only enhances the aesthetic and functional aspects of exhibition design but also allows for continuous improvement based on visitor feedback and interaction data.

¹⁴ Ibidem

¹⁵ Teece D.J. (2018) Profiting from innovation in the digital economy: enabling technologies, standards, and licensing models in the wireless world, Research Policy, 47.

The theme of the next Milan Design Week 2025 it's going to be "Connected Worlds", which it's going to be a participatory and generative design process through the integration of artificial intelligence¹⁶. This theme encourages reflection on how design connects various aspects of our lives, from the natural environment to advanced technologies and from cultural traditions to future innovations. It emphasizes design's role in fostering unity and global cooperation. This theme explores the connection between physical and digital worlds, enhancing life quality through AI and smart devices. It highlights cultural exchange, ecological design, and sustainable technologies in urban contexts. It underscores the importance of designing public spaces that foster social interaction and installations that promote inclusivity and dialogue. Additionally, it examines urban mobility innovations and the sharing of information across disciplines. Milan Design Week 2025 aims to celebrate relationships and engagement through design, showcasing how hybrid skills and immersive experiences can transform our ways of living, working, and interacting with the world.

5. Adaptive design: the role of intelligence in the built environment

To develop our project, we drew inspiration from the 2025 Venice Biennale project curated by Carlo Ratti. The nineteenth International Architecture Exhibition of Venice, in fact, will be dedicated to the built environment and the numerous disciplines that shape it. Architecture is at the center of these, but not alone: it is part of an extensive ensemble that must integrate art, engineering, biology, data science, social and political sciences, planetary sciences, and other disciplines, connecting each of them to the materiality of urban space.

« The titles of the International Architecture Exhibitions are usually announced in both English and Italian. However, in 2025, the title will be condensed into a single word for both languages, invoking their common Latin origin: *Intelligens*. From *intelligens* comes the modern <intelligence>; this choice, however, also indicates an expansion of associations in meaning. Translated separately, the final syllable, <gens,> means <people>; from this emerges an imagined alternative root, suggesting a future of intelligence that is more multiple and inclusive, escaping the excessive limits of today's focus on AI »¹⁷.

¹⁶ Cfr. Salone del Mobile 2025 (2024) Comunicato stampa. URL: [hHps://www.salonemilano.it/en/exhibitions/saloneinternazionale-del-mobile](https://www.salonemilano.it/en/exhibitions/saloneinternazionale-del-mobile)

¹⁷ C. Rah (2024) Biennale architeRura 2025: il Atolo è intelligens. naturale. arAficiale. colleXva. [hHps://www.labiennale.org/it/news/biennale-architeHura-2025-il->tolo-è-intelligens-naturale-ar>ficiale-collehva](https://www.labiennale.org/it/news/biennale-architeHura-2025-il->tolo-è-intelligens-naturale-ar>ficiale-collehva)

The built environment is among the major contributors to atmospheric emissions. In this sense, architecture can be blamed for much of the environmental degradation of our planet. In the face of the accelerating climate crisis, must we resign ourselves to this role, or are we still able to offer substantial, not cosmetic, solutions that are effective and quick to implement? The Exhibition will attempt to chart new paths for the future, suggesting a range of solutions to the most pressing problems of the present. It will bring together a collection of experimental design proposals, inspired by a definition of “intelligence” as the ability to adapt to the environment starting from a limited set of resources, knowledge, or power. The exhibition, in particular, imagines architects as “mutagenic agents”, capable of triggering evolutionary processes and directing them in new directions. Learning from multiple scientific disciplines, and advancing through trial and error, this exhibition aims to accelerate the transformation of the present in the search for better futures. Objects, buildings, and urban plans will be arranged along the axis of a multiple and diffused intelligence, dividing the space into three main thematic areas related to natural intelligence, artificial intelligence, and collective intelligence. Some ideas are destined to fail. But others may point us to promising paths.

5.1 Natural Intelligence

Architecture, whose original function is to shelter humans from natural elements, now relies on nature to re-orient its action. Bringing vegetation back to the heart of our cities is one of the most effective ways to combat extreme temperatures. Organic materials can store carbon while also preventing further emissions through insulation. Biomimicry reminds us that the best designs are the product of millions of years of evolution. Will we one day be able to design a building as intelligent as a tree?

5.2 Artificial Intelligence

Vast networks of connections and sensors link our metropolises, creating a digital infrastructure that spans the entire planet. Despite their energy consumption, these technologies can be used to mitigate the environmental impact of urban development. Thanks to real-time feedback loops, the built environment is beginning to respond like a living organism. At the same time, artificial intelligence could disrupt the traditional role of architects. How will the profession change when generative models can produce construction details from a simple textual input?

5.3 Collective Intelligence

Since prehistoric times, architecture without architects has been able to devise sustainable solutions in response to environmental pressure. From the Machiya of Kyoto to the Dogon rock dwellings on the Bandiagara Plateau, and from the Trulli of Alberobello to the vast array of settlements classified as “informal” that are still the main drivers of urban growth today, collective intelligence speaks to us of adaptation: working with nature, not against it. How can we connect the old and the new to harness the endless possibilities of collective intelligence?

6. Innovative pathways: methodology for integrating digital tools in exhibition project

Carlo Ratti, Artistic Director of the Architecture Sector of the Venice Biennale, invites students, graduates, and emerging professionals under 30 (from architecture, urban design, engineering, interior design, landscape architecture, and built environment) to submit projects that utilize natural, artificial, and collective intelligence to combat the climate crisis¹⁸.

From this global pool of applications, the Artistic Director will select up to 16 projects to be developed in the Biennale College

Architecture program. Selected candidates will be invited to participate in a 10-day workshop in Venice in September 2024 to further develop their proposed projects, including production plans and budgets. The workshop, led by Carlo Ratti along with a group of curators, architects, tutors, and mentors, will feature both group and individual sessions, as well as meetings with visiting professors and cultural operators.

A final selection of up to 8 projects will be chosen by Carlo Ratti himself. Each selected project will receive a grant of 20,000 euros for production and will be presented out of competition at the 19th International Architecture Exhibition. The goal of this project is, among other things, to expand opportunities for emerging young professionals by sharing their work with a wide audience. The Venice Biennale has long supported the productions of emerging talents in the fields of Art, Cinema, Dance, Music, Theater, and the Historical Archive of Contemporary Arts.

The methodology chosen for the project selection will specifically include four main areas:

- **Transdisciplinarity:** Architectural projects will promote collaborations among different professionals, with the goal of advancing scientific knowledge wherever possible.

¹⁸ Ibidem

- **Living Lab:** In 2025, the Central Pavilion at the Giardini will be under renovation. Consequently, it will be replaced by a series of special projects designed to transform portions of Venice and the external areas of the Biennale exhibition sites into Living Labs, where multiple forms of intelligence can converge.
- **Idea Collection:** Adopting a collaborative approach to design is crucial, especially in times of crisis. On May 7, 2024, the Biennale website will open a space for collecting ideas to expand the diversity of voices, visions, and suggestions.
- **Circularity Protocol:** The Exhibition aims to achieve particularly ambitious circularity goals. Through the development of a Circularity Manifesto, precise guidelines will be established, setting a new standard for future cultural events.

7. Sustainable synergies: exploring through interdisciplinary collaboration

The project draws inspiration from the criteria chosen by Carlo Ratti for the Venice Biennale 2025, focusing on the integration of new technologies and the importance of sustainability in materials and production processes. The exhibit aims to explore how advanced technologies, such as Artificial Intelligence, Augmented Reality (AR), Virtual

Reality (VR), and the Internet of Things (IoT), can enhance awareness and understanding of the urgency to develop sustainable materials and processes. The goal is to create an interdisciplinary dialogue between art, engineering, natural sciences, social sciences, and technology, promoting innovative solutions to address the climate crisis and reduce the environmental impact of the production sector.

The chosen methodology thus follows the one developed by Carlo Ratti and is structured around four fundamental criteria:

- **Transdisciplinarity:** The project will promote collaboration among professionals from various disciplines, including architects, designers, engineers, material scientists, biologists, and technology experts. The objective is to develop scientific knowledge and practical solutions that integrate sustainable approaches into design and production processes.
- **Living Lab:** Part of the exhibition will be organized as an interactive “Living Lab,” where visitors can experience firsthand the applications of new technologies in sustainable production processes. Dedicated spaces within the exhibit will allow for the observation and participation in practical demonstrations of innovative production techniques, such as 3D printing with recycled materials, biofabrication, and the use of natural and renewable materials.

- **Idea Collection:** A virtual space will be created on the exhibit's website to collect ideas, proposals, and suggestions from professionals, students, and the general public. This space will serve to stimulate an open and collaborative dialogue, broadening the diversity of voices and visions on the topic of sustainability and innovation in materials.

Circularity Protocol: The exhibit will adopt a Circularity Protocol, establishing precise guidelines for waste reduction and the promotion of reuse and recycling of materials used in the setup. This approach will not only minimize the environmental impact of the event itself but also serve as a model for future exhibitions and cultural events.

Similarly, the event will be divided into three thematic sections:

- **Natural Intelligence:** This section will explore the use of natural and biomimetic materials, showing how inspiration from nature can lead to sustainable and innovative solutions. Examples of biodegradable materials, fabrics derived from living organisms, and structures inspired by natural processes will be displayed alongside interactive demonstrations.

- **Artificial Intelligence:** Here, visitors will explore how AI can optimize production processes to reduce waste and improve energy efficiency. Projects using AI to monitor and manage the lifecycle of materials will be presented, as well as examples of generative design that create optimal structures with minimal resource use.

- **Collective Intelligence:** This section will be dedicated to collaboration between communities and professionals to develop shared solutions for sustainability. Examples of community recycling and reuse projects, circular economy initiatives, and knowledge and resource exchange platforms will be showcased. Visitors will be invited to actively participate through workshops and brainstorming sessions

8. From awareness to action: immersive technologies for interdisciplinary design

In conclusion the role of the designer involves shaping and enhancing practices that promote the circularity of actions, materials, products and event.

The project aims to raise public awareness about the importance of sustainability in materials and production processes through an innovative and interactive approach.

Under these circumstances, both designers

and society must be aware of the origins of materials and enhance the use of those that reduce environmental impact and promote awareness and change. To define and increase the application of these materials, fostering processes of valorization, understanding, and implementation, it is essential to examine how to represent the value and significance of materials in relation to the theme of sustainability.

Inspired by the methodology of the Venice Biennale curated by Carlo Ratti, the event will promote interdisciplinary collaboration and the use of new technologies to create educational and engaging experiences. This will encourage visitors to reflect on their choices and the environmental impact of their daily actions. The exhibit will leverage Extended Reality (XR) technologies to create immersive and interactive experiences. Using AR and VR, visitors will be able to explore virtual environments that demonstrate the impact of sustainable materials and innovative processes in various contexts, from industrial design to urban architecture. The integration of IoT sensors will create a responsive environment, where displayed objects and installations react to visitors' movements and interactions, making the experience more engaging and memorable.

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In the academic sphere, she serves as a teaching assistant for courses in Exhibit Design, Interior Architecture, and Furniture Design. Since 2022, she has also been working as a freelance designer.

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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

<https://cumulusassociation.org/>

ISSN 2490-046X

ISBN 978-952-7549-06-3 (pdf)

No. 13 Cumulus Conference Proceedings Series

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