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SPECIAL ISSUE EDITORIAL

Design Contributions for the COVID-19 Global Emergency (Part 2): Methodological Reflections and Future Visions

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This is a landmark publication for the field of design. It was catalysed by unprecedented circumstances, as designers around the world had to rapidly deploy their competencies in strategic problem-solving to help humanity in the fight against an invisible enemy during a global pandemic. In alliance with other disciplines, from medicine to mechanical engineering, from computing to anthropology, designers everywhere have addressed the challenges and produced remarkable results through a diversity of initiatives. This Special Issue presents a peer-reviewed sample of these initiatives.

The coronavirus pandemic can be considered as the biggest 'problem' faced by an entire generation of designers. It has produced a great many unexpected changes and demands, many of which neither governments, companies nor communities were prepared to handle. Although designers were able to gather existing knowledge and reapply it, it became clear that our ability to learn from the past was limited, considering the complexities presented by COVID-19. Hence, a wholly deductive or inductive approach was neither viable nor relevant, as, in the last one hundred years, humanity has never been asked to face a pandemic of such scale and gravity. The result was a rapid, earnest application of abductive reasoning, typical of the creative process inherent in design activity. In a short period of time, designers contributed, and in many instances led, innovation processes associated with products, systems, services and experiences to mitigate the impacts of the coronavirus.

The promotion of this Special Issue has brought together a coalition of the main global design institutions, which is in itself a remarkable achievement: **LeNS (Learning Network on Sustainability),** the **DESIS Network (Design for Social Innovation and Sustainability),** the **Cumulus Association,** and the **World Design Organization (WDO)®.** As a result of this collaboration, the number of submissions and their global geographical distribution would match a large international conference, a clear indication of the level of engagement of the design community around the world. Indeed, this Special Issue received 115 submissions by researchers from 26 countries located on 5 continents.

While Part 1 collected 31 papers dedicated to empirical contributions, with direct accounts of the hands-on activities of designers in different contexts, the Special Issue's Part 2 contains 30 papers focusing on the theory underpinning the practical experiences as well methodological reflections concerning the role of design during the pandemic.

In Part 2, most papers present thematic reflections around the opportunities to conceive new human-centred 'normalities' for the (post-)pandemic scenario(s). Along with rhetoric around scientific disciplinary frameworks, sustainable and inclusive visions, reflections on methods and tools, the design community has also admirably expressed the need to open up new strategic themes, with the idea to establish synergic connections at all scales of society. Therefore, we see not only methodological reflections and visions on places (i.e. urban environments, schools, homes), but also multidisciplinary actions of rethinking, new processes, ways to inform and visualize data for public utility, as well as considerations on learning environments and recommendations for new resilient processes. The future, the orientation that allows us to conceive of better lifeways, is the theme recurrent in this volume. Thus, the papers presented here contribute to proposing a holistic set of ideas useful for designing a liveable future, where the new normalities that people will be able to shape will generate positive affections for a sustainable, inclusive and innovative world.

REFLECTIONS ON THEMES FOUND ACROSS PAPERS

The COVID-19 emergency evidenced our physical vulnerability and pushed us to avoid risks. We adopted protective measures such as social distancing, isolation and lockdown to protect us from other people that may carry the virus and prevent its spread. It changed our everyday practices and how we relate to each other, our spaces and places, including our living and working conditions or our consumption practices. The articles in this special issue highlight design's ability to observe and reinterpret these new everyday practices by exploring new frameworks for living and doing in a (post-)pandemic scenario.

Though it has not formally been made explicit, a hidden umbrella concept in all articles is the *post-pandemic future*. The papers open up prospects on housing, work, communication, education, consumption, placemaking and productive processes. Together, the results present possible directions towards new ways of post-pandemic living, organizing and doing, and explore possible design responses, in theoretical and practical terms.

A common topic found across the papers can be referred to as *design sensibility*, i.e., the ability of design to tap into a set of interpersonal qualities such as care, empathy or different aspects related to well-being or emotions. It includes reflections on how the pandemic has pushed designers to reimagine design processes and results at different levels (communities, organizations and governments). The articles focus on the effects of new constraints and situations brought by the pandemic on interpersonal relations or individual practices in private or public spaces. It also includes – implicitly or explicitly – considerations of design agency, i.e. how designers can develop a new sensibility in their own practices regarding the interrelations between non-human and human entities, including themselves.

Another topic – also identified in the articles featured in Part 1 of this Special Issue – is *resilience* and, in particular, social resilience as the capacity to transform adversities brought by the pandemic into personal, relational and collective growth. A group of papers exemplify this social dimension by analysing how network members – i.e. maker networks – demonstrated their agility to get organized to provide prompt responses to the crisis.

Articles under this topic also reflected upon the adaptability required from businesses and schools to face COVID-19 or proposed to improve resilient responses by local (physical) communities through digital platforms.

Articles in this Special Issue crossed over *diverse areas and approaches*, from design for sustainability, design for social innovation, design for transitions, service design, industrial design, communications design, architectural design, open design, co-design, responsible design to design management.

THEMATIC CLUSTERS

Three thematic clusters can be identified in Part 2 of the Special Issue.

The first cluster of papers provides **reflections on the design processes adopted in response to the pandemic crisis** and its consequences for design research and practices. This can be further categorized into four groups.

The first group offers insights and recommendations for (post-)pandemic design. Gaziulusoy et al. provide a research agenda on how design could contribute to sustainability transformations leveraging on the structural dysfunctions, inequalities and injustices made visible by the COVID-19 emergency. Rossi calls for a more strategic role of design in defining post-pandemic scenarios. In particular, Design for Social Inclusion and Design for Sustainability approaches are adopted in synergy to explore a range of potential inclusive ideas to sustain the transition toward enabling living conditions of places and communities. Marotta et al. analyse the epistemic and ontological consequences of the pandemic in the field of design research. Salamanca and Briggs reflect on the idea that human-centred design relies on a biased value system that either disfavours some social groups or disregards nonhuman living agencies, and on the basis of this propose that responsible innovation should adopt a posthuman perspective capable of considering the needs of both human and nonhuman living agencies. Van Amstel et al.'s paper looks at sociotechnical controversy in COVID-19 design responses to the pandemic and suggests that systemic relations are still overlooked by the design community, due to the lack of depth in problematizing COVID-19. As a response, the authors propose recommendations for a systemic design space for pandemics and other systemic crises. Deregibus analyses the inability of the Italian architectural debate to produce tangible effects on how society could tackle the pandemic crisis. On the basis of this reflection the author proposes a strategy to make architectural design more effective in influencing the pandemic debate. Seibel et al.'s paper reports on the impact of COVID-19 on the fashion industry and reflects on the threats and future opportunities for various businesses. The paper also suggests that small businesses, due to their agility, may have a greater capacity to adapt and respond to the new post-COVID-19 moment.

Three papers focus on *design education and design processes*. The study proposed by van der Bijl-Brouwer and Price addresses the problems of risk of burnout, lack of motivation, and social isolation faced by some students during the COVID-19 emergency. Adopting a strategic human-centred design approach, the authors present a number of design principles aimed at promoting student well-being in (pandemic) higher education. Ozturk et al.'s paper analyses the tools that design professionals and students can use to enable remote collaborative design, identifies problems (e.g. limited transfer of tacit knowledge), and suggests improvements for a more effective remote collaboration. Again on the topic of collaborative

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work when physical proximity is not possible, Davis et al. report on novel possibilities for design remote collaboration through the concept of 'lowcontact co-design', exploring a range of spatiotemporal conditions within which co-design practices can occur.

A range of papers reflects on *design models and tools.* The work presented by Schmidt and Stenger analyses the barriers that COVID-19 behavioural interventions usually face when implemented, identifying three common "errors of projection" in current behavioural design methodology: projected stability, projected persistence, and projected value. Borrowing from strategic design and futures thinking, the paper puts forward 'behavioural planning', a foresight model to support practitioners in identifying potential forces that may impact behavioural interventions before they have been implemented. Amorim and Quaresma's paper reflects on the fact that the COVID-19 pandemic has significantly affected not only people's routines, but also their mental health, and discusses the effectiveness of the 'user journey' tool to represent the diverse range of people's experiences and emotional states. The paper highlights the importance of using individual user journeys in order to capture details that otherwise would get lost in generalized user journeys.

Four papers discuss how the current pandemic offers us *opportunities to re-think design qualities.* Through an analysis of cases of design interventions that have emerged during the pandemic, Mullagh et al. consider the role design can play in collectively recovering from the current pandemic and building resilience for the future. The work of Wernli and Boyer uses anthropological inquiries to explore the role of the design discipline and its required social commitment. Villari's paper discusses the adoption of empathy in the governance of complex ecosystems to make them more resilient to unexpected phenomena such as COVID-19, and it calls for an 'empathic revolution', which includes the use of empathy not only as a lever to understand users' needs in the development of new products and services, but also as a lever of innovation at a community, organizational and governmental level. Barauna et al. discuss how the pandemic situation is driving new models of economies and how design could act as agent of change towards a circular, distributed, creative and regenerative economy.

The second cluster of papers includes contributions providing **reflections on specific design responses to the ongoing crisis,** considering both physical artefacts (and their manufacturing) as well as data visualization and communication needs. Three subcategories can be identified.

The first group includes four papers and focuses on the role that *distributed manufacturing* can play in pandemics and other emergencies. Campos and Cipolla build upon the analysis of recent initiatives that were to manufacture PPE for frontline health staff and put forward a set of design guidelines for enabling maker networks to implement redistributed manufacturing models. Corsini and Moultrie adopt a socio-technical analysis approach to examine how open, local and distributed manufacturing can have a systemic impact in the Global South, reflecting on how the current crisis creates windows of opportunity for sustainable development by exploiting distributed manufacturing networks. With a specific focus on Latin America, Herrera et al.'s paper investigates how distributed manufacturing has enabled local networks to produce global co-design experiences. Braida and Unanue provide an analysis of various cases of design, production and distribution of face shields in Brazil, with a particular focus on distributed manufacturing and the network formation and modus operandi aspects.

The paper by de Souza Sierra and Catapan addresses the topic of *individual and collective safety devices,* providing a review and categorization of 171 solutions with a particular emphasis on user safety and satisfaction.

The third group of papers in the second cluster focuses on *data (visualization) and communication* and how to help people to understand the causes and implications of the pandemic emergency and enable them to make informed choices. Through the analysis of examples, Giannella and Velho provide an investigation of three different approaches for data visualization, namely: visualization of hypothetical data, visualizations based on secondary data and visualization for social criticism and self-reflection. Da Fonseca and Kistmann discuss the use of population monitoring to define strategies to mitigate the COVID-19 emergency and reflect on the related ethical issues such as data privacy and surveillance. On the basis of this, the paper reflects on how and what designers should consider when integrating population monitoring into their data visualization strategies. Orhun and Yıldırım propose a reflection on how the pandemic is influencing personal behavioural transformations with a particular focus on emerging communication needs.

The third cluster of papers focuses on **reflections on the design responses to the need to reimagine spaces and places,** including homes (even as new working spaces), and more generally on how the pandemic required new design perspectives on placemaking and the rethinking of public and urban spaces. The papers can be grouped into four categories.

The first group focuses on *homes.* Acharya and Pop address the topic of working from home, and in particular analyse people's activities as they merge and separate their professional work and domestic living within their homes. From this analysis, they identify particular activities that allow people to overcome the pressures of merging professional work and domestic living and reflect on how designers and architects can amplify those 'tactical acts' for better 'working from home' environments. AlKhateeb and Peterson explore the impact that COVID-19 has on perception of home and home design in Saudi Arabia. Comparing user responses before and after the lockdown, the paper shows the trending of user preferences towards spaces that would function for a range of family activities including studying, working from home and entertainment.

Furlani and Cardoso address the topic of *schools,* with a particular emphasis on how to adapt Brazilian schools in order to safely resume teaching activities. The paper presents adaptation strategies based on the recommendations of six competent bodies and case studies.

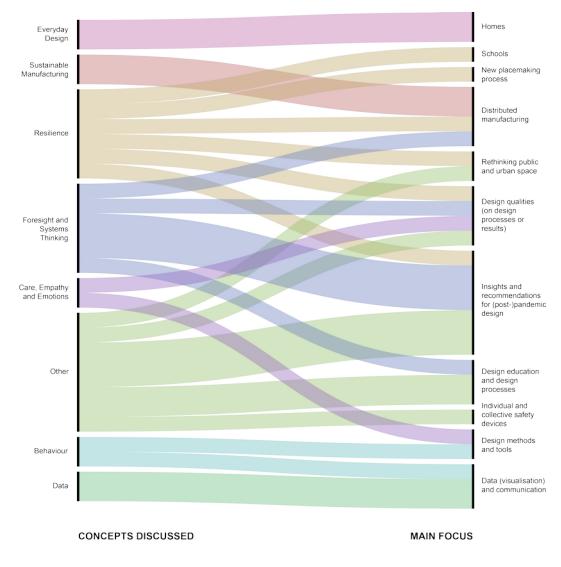
Manzini and Menichinelli tackle the topic of a *new placemaking process*, with a focus on how we can design for and with the new kind of communities emerging because of the COVID-19 emergency. The paper provides an overview of the changes the pandemic has brought to communities and proposes 10 design guidelines for design research and practice for the development of resilient, fair and open platforms for communities after COVID-19.

Two papers focus on rethinking *public and urban space.* The work by Gruosso reflects on the Italian public space par excellence, the piazza, and how COVID-19 has challenged its role as a space for interaction. Building upon four Italian design experiences, the paper proposes an updated idea of piazza, characterized by being an adaptive public space that, while respecting the COVID-19 logistical constraints, allows people to return, in new ways, to social interactions. Finally, Snyder presents a reflection that extends interior and architectural design practice and theory, through multi-disciplinary and multi-site research.

DATA INTERPRETATION

Papers collected in this issue's Part 2 depict the efforts of the design community to envision new scenarios and future visions, as well as reflect on the role of design methodologies and on the production of meaningful design and research insights to tackle the pandemic.

We conducted a two-fold analysis around the interdisciplinary relations of concepts discussed across the papers, and here we report on the first set of data representing the taxonomy of contributions. The correlation between concepts discussed and main foci allows understanding the **strategic goals of studies** presented in the Special Issue's Part 2 (Figure 1). In particular, two groups of papers cover over one third of contributions: 6 studies deal with the notion of *Resilience* and with *Foresight and Systems Thinking* respectively; these represent the most important concepts found across all papers (12). A large group of studies explores the following topics: *Everyday Design* (2), *Sustainable Manufacturing* (2), *Care, Empathy and Emotions* (2), *Data* (2) and *Behaviour* (2). The remaining papers describe unstructured topics merged under a general classification *Other* (8). In terms of design foci, nearly a quarter of studies discuss *Insights and recommendations for (post-)pandemic design* (7), followed by *Distributed Manufacturing* (4) and *Design qualities* (4). The remaining studies focus on *Data (visualization) and communication* (3), *Design education and processes* (3), *Homes* (2), *Rethinking public and urban space* (2), *Design methods and tools* (2), *Schools* (1), *New placemaking processes* (1) and *Individual and collective safety devices* (1).



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Figure 1: Thematic nature and strategic goals of studies: methodological reflections and future visions.

On the other hand, the comparison between concepts discussed and design approaches depicts the **thematic design lenses** used to face the interdisciplinary issues contained in all studies of Part 2 (Figure 2). It is compelling to see the intrinsic resilience, or flexibility, characterizing the design discipline, which allowed approaching the same concept through various sub-disciplines. Therefore, the studies presented by authors contribute to portraying a constellation of possible interventions, spanning from methodologies and methods to visions and prefiguration of liveable post-pandemic scenarios.

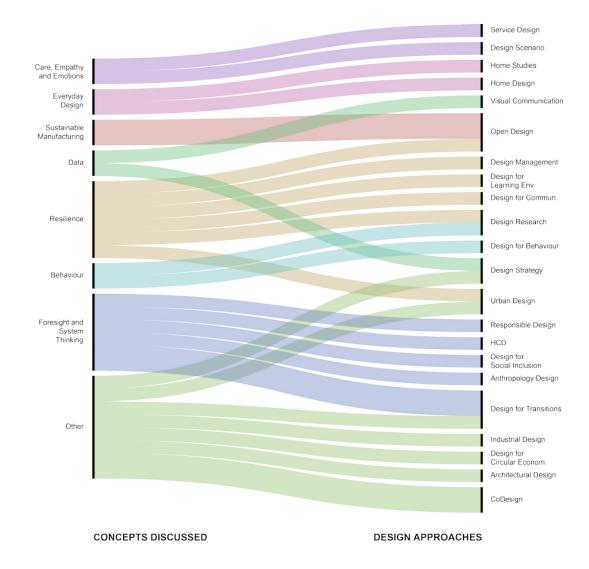


Figure 2: Thematic lenses connecting strategic concepts and the multitude of design approaches.

Two keywords are suitable to describe the taxonomy of studies contained in this Part 2: *complexity* and *opportunity*. The papers demonstrate the intrinsic complexity of the issues related to present and post-pandemic scenarios; this complexity is also seen as a reflection of the opportunities offered in new visions. Overall, the studies outline the strong sensitivity of the community to operate at many scales using a multitude of design approaches.

Three main **reflections on the role of the design discipline** are outlined in this publication (Figure 3), where the role of the discipline – responses and processes – is linked with the factors of 'time' and 'space'. This analysis provides an intriguing map of all design contributions in relation to all methodological insights and future visions. In particular, *Reflections on the design processes adopted in response to the pandemic crisis* gathers 53% of the contributions (16 papers) clustering 14 design and sub-design disciplines/approaches. Insights, methods, processes and qualities are the main foci discussed. From the

methodological point of view, this collection of papers reveals an interesting correlation between the importance of discussing formal design methodologies as well as proactive processes to connect the present conditions with the future topics that the design community will be asked to tackle (i.e. inclusive ideas). The interest of the design community to address and reflect on the opportunities to connect the existing conditions raised by the pandemic with future living scenarios is the 'fil rouge' linking all papers. Eight papers discuss Reflections on specific design responses to the ongoing crisis. This group argues for practical or pragmatic issues to be used in the short term; this aspect is also reinforced by the analysis of the specific contributions belonging to this section that examine manufacturing, industrial design, data and communication. Accordingly, here the interest of the community is oriented to the exploration of design-based patterns linking manufacturing, design methods and processes. Finally, the third group of considerations is about the *Reflections on the design* responses to the need to reimagine spaces and places. In this group, 6 papers connect the design discipline with the study on the contexts (i.e. urban and home spaces) as well as the implications of design methodologies on immaterial places (i.e. learning environments). This last group of papers gathers methodological contributions and emphasizes the multidimensional effects of suitable methodologies for rethinking living and working places.

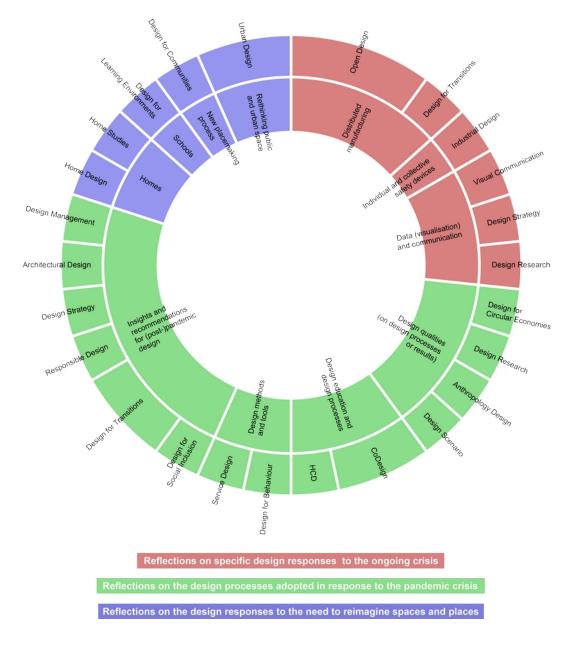
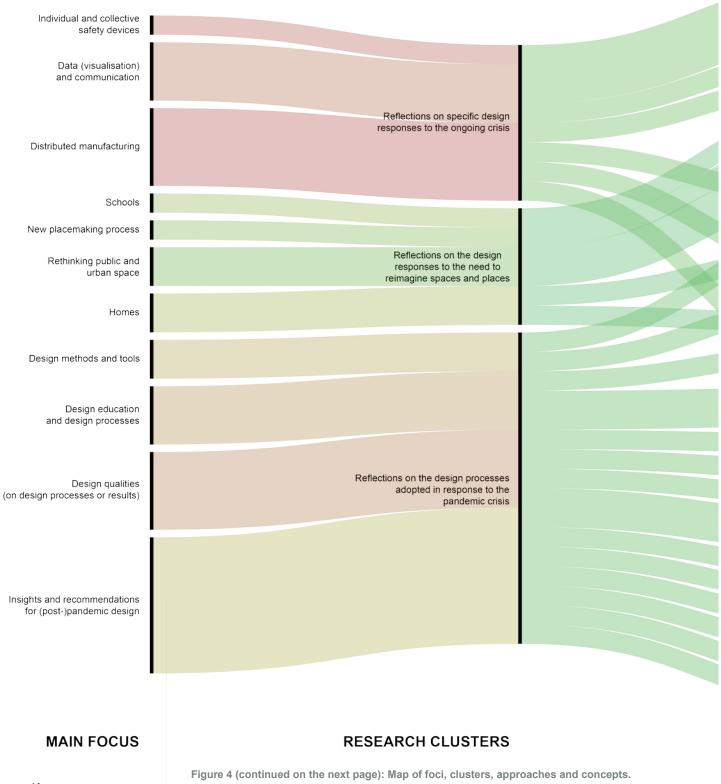


Figure 3: Multidimensional reflections on the role of the Design discipline.

The comparison between *Main Foci, Research Clusters, Design Approaches* and *Concepts Discussed* provides a complete and holistic overview of the **explicit, implicit and hidden interrelations among papers composing the Special Issue's Part 2 and the reflective conditions of future post-pandemic scenarios.** The map (Figure 4) portrays all methodological reflections as well as the future visions by the design community in the last year, as a response oriented towards a better world looking for new 'normal' lives. While the correlation between *Main Foci and Research Clusters* provides a semi-logical and predictable association of concepts, the specific *Design Approaches* used in the various studies reveals the intrinsic flexibility by which the discipline tackles similar issues. This concept is reinforced by observing the correlation between *Design Approaches* and *Concepts Discussed*.



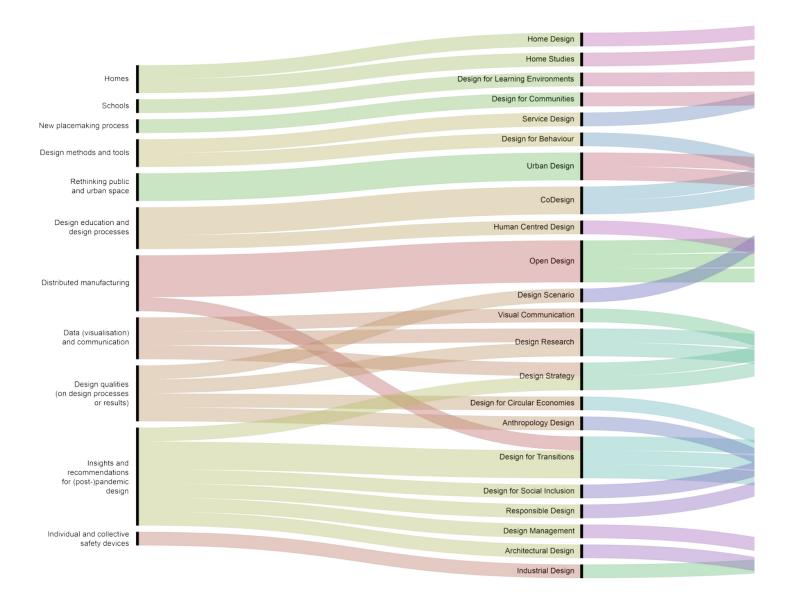
Overall, this map is also useful for readers to apprehend the range of papers that can be found in Part 2. In terms of clusters, readers will find a significant number of studies focused on processes to tackle the ongoing crisis (16); in terms of concepts, *Resilience, Foresight and Systems Thinking* and *Other* will depict the various methodological lenses used to tackle the contemporary and future issues around the idea of 'new normality' and 'post-pandemic'. The most interesting aspect readers will find in this map is the filter operated by the Design Approaches. Therefore, readers of this Special Issue can navigate this map with the idea to explore the specific insights arising within a given disciplinary domain, linking the macro topics belonging to *Clusters, Foci* and *Concepts* or, instead, they can appreciate a disciplinary-led analysis by exploring, individually, the various contributions produced (*Approaches*).

Open Design	
Visual Communication	Sustainable Manufacturing
Industrial Design	
Design for Learning Environments	
Design for Communities	Resilience
Urban Design	
Design Research	Behaviour
Home Studies	Data
Design Strategy	
Home Design	
Design Management	Other
Design for Transitions	Other
Design for Behaviour	
Design for Circular Economies	Everyday Design
Architectural Design	
CoDesign	
Responsible Design	Foresight and Systems Thinking
Human Centred Design	
Design for Social Inclusion	
Anthropology Design	Care, Empathy and Emotions
Service Design	
Design Scenario	

DESIGN APPROACH

CONCEPTS DISCUSSED

The next two maps (Figures 5 and 6) have been created with the aim to **simplify the interpretation and the comprehension of papers** contained in this Part 2 in relation to all key topics used for their classification – *Main Foci, Concepts Discussed* and *Research Clusters* – as well as to give readers the possibility to find and readily compare the papers using common interpretative lenses that could simplify the analysis of data and the understanding of field experiences, or explorations.



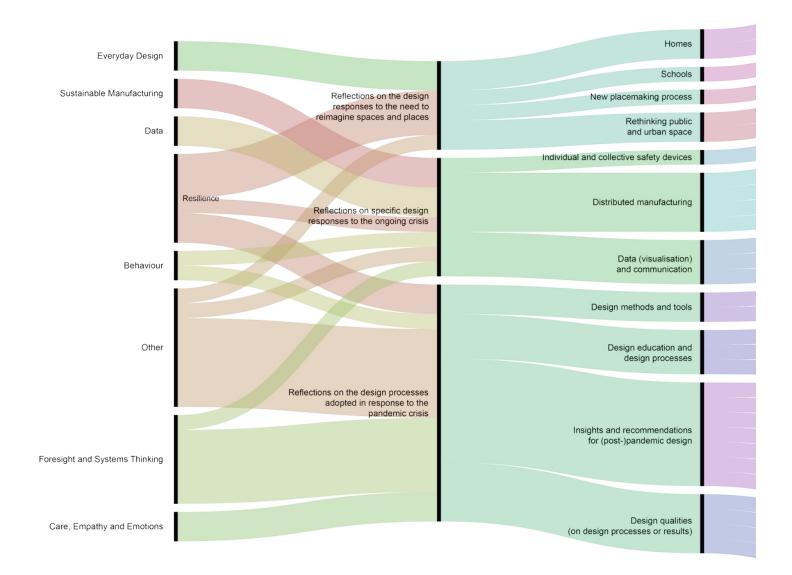
MAIN FOCUS

CONCEPTS DISCUSSED

Figure 5 (continued on the next page): Map of links between papers, Concepts Discussed and Main Foci.

The Impact of COVID-19 on Perceptions of Home and House Design in Saudi Arabia
Tactical Acts from Lockdown Homes
Using User Journey to Map Emotional Oscillations During COVID-19 Social Distancing
Rethinking School Design After Covid-19 in Brazil: Strategies of Public-School PEE-12 FNDE
Platforms for Re-Localization: Communities and Places in the Post-Pandemic Hybrid Spaces
The Empathic (r)Evolution: Lessons Learned from Covid-19 to Design at the Community, Organization, and Governmental Levels
The Effect of Remote Collaborative Work on Design Processes During the Pandemic
Low-Contact Co-Design: Considering more flexible spatiotemporal models for the co-design workshop
Re-Start Italy: (post-)Covid19 Lessons for Full Scope Renovation of the Italian Public Space
Interiorism as a Means to Go Forward in Designing for the Adaptable City
Behavioral Planning: Improving Behavioral Design with "Roughly Right" Foresight
Networks of Digital Manufacturing of Face Shields and the Covid-19: Design, Maker Culture and Social Mobilization
Maker Networks Fighting Covid-19: Design Guidelines for Redistributed Manufacturing (RDM) Models
Design During COVID-19: Agents and Allies in the Role of Designer, Digital Fabrication and Distributed Production
An adaptive and strategic human-centred design approach to shaping pandemic design education that promotes wellbeing
Prospecting a Systemic Design Space for Pandemic Responses
Design and Covid-19: Monitoring Urban Data
Invisible to Visible: Identifying the Emerging Communication Needs in the 'New Normal' through Design Research
Designing for a Pandemic: Towards Recovery and Resilience
Data Visualization in the Time of Coronavirus
Enabling Ideas for Inclusive Post-Pandemic Scenarios
Devising Design Research Paths for Responsible Innovation in the Context of a Global Pandemic
From Emergency to Emergence: Re-Think Design Approach in a Transition Age.
Distributed Manufacturing & COVID-19: Is Crisis a Window of Opportunity for Sustainable Development in the Global South?
Design for Sustainability Transformations: A 'Deep Leverage Points' Research Agenda for the (Post-)Pandemic Context
COVID-19 and the Emergency of New Economies for the Design of a New World
'Breathful' Design in Breathless Times
Designing for the Pandemic: Individual and Collective Safety Devices
Covid-19's Impact on Society, Fashion Trends and Consumption
Bad Strategy and Dark Matter: Reframing Italian Architectural Debate on the Post-Pandemic

PAPERS



CONCEPTS DISCUSSED

RESEARCH CLUSTERS



Figure 6 (continued on the next page): Map of links between papers, Concept Discussed, Research Clusters and Main Foci.

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PAPERS

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CONCLUDING NOTES ON ARTICLES COMPRISING PART 2

An overall view of these papers reveals the contribution of the whole design community in facing the present and future issues, both local and global, related to imagining the idea of a new normality, which is needed to open up societal changes and transitions toward a new, 'better' normal life. Present conditions, future visions, methods and approaches, education and urban lifestyles, as well as the will to boost the societal processes needed to trigger the hoped-for new normality are some examples. At the same time, new research subjects interpreting the pandemic and projecting the local instances to the global dimension are now predominant issues to include in subsequent agendas, revealing the hope for stronger cross-contaminations among research subjects.

Foremost, the articles show an active community working around relevant issues like 'future', 'perspectives', 'methodological insights', which are a clear reflection of the ongoing complexity. Positive instances such as collaboration, open knowledge, social opportunities and new normalities are juxtaposed to emerging concepts full of inner tensions like medical treatments, social isolation, uncertainty, isolation and distant hope. Thus, this publication provides the necessary space to reflect on the lessons learned during this period with the idea to look beyond the known; intrinsically and historically, this is the inner soul of the design discipline: looking for alternative, sustainable and inclusive scenarios. It is a solid contribution to leverage our knowledge on how to engage design and designers during an ongoing global crisis but, foremost, to open up new themes that can be addressed by reflecting on the past and by thinking about the possible future design actions using its original Latin concept: *proicere* – throwing (as projecting) into the future.

Overall, the Special Issue's Part 2 provides meaningful insights for transition scenarios and new agendas for the aftermath of the pandemic.

Some conclusion notes must be made to recall the significant efforts expended by the design community represented in this two-part Special Issue, which has been heavily affected by the pandemic like any other community of professionals. In particular, even the articles presented in this Part 2 show that the community is not powerless. When present emergency conditions limit the positive stimuli for conceiving a better world, design is the discipline that, probably better than others, is able to rapidly frame the problems, creatively shape ideas, connect various fields of knowledge to deliver viable propositions and, especially, imagine a new future where viable propositions are linked to heritage, autochthonous values and global-local conditions of well-being. When pessimism shrouds our ideas about the new normality, design demonstrates its ability to reveal original opportunities to restart as well as to elicit the needed ethos for new reframed explorations on methods. As stated in the Special Issue's Editorial of Part 1, the community demonstrated, without doubt, its capacity to save human lives and, also, to imagine, or predict, alternative and realistic ideas about the future.

The 30 papers contained in this publication illustrate well that the pandemic has forced designers and design researchers to realize that many assumptions they took for granted in the past were no longer in place; this has forced them to reflect on the role of the discipline in relation to the idea of contemporary uncertainty as well as the concepts of curricular tradition and scientific legacy. From today, new topics will enrich our research and design agendas. These and so many other issues are documented in the studies presented by the selected authors for this Special Issue's Part 2.

For all these reasons, the guest editors believe that this historical edition in two parts of the Strategic Design Research Journal is a solid contribution to enrich the scientific debate regarding what we have learnt from the actions taken during the COVID-19 emergency scenario. We hope that this knowledge will contribute to develop further our collective capabilities and readiness to deal with present as well as future global emergencies.

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