C3

CONNECTIVITY and CREATIVITY in times of CONFLICT

Cumulus Antwerp

2023

Cumulus Association

Cumulus conference: Connectivity and Creativity in times of Conflict
Hosted by the Faculty of Design Sciences, University of Antwerp, Belgium,
on April 12-15, 2023
Conference website: Cumulusantwerp2023.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

This publication bears the GPRC label (Guaranteed Peer Reviewed content).

ISSN 2490-046X
No. 10

Cumulus Conference Proceedings Series
Editor-in-Chief: Cumulus President Lorenzo Imbesi

Publications in the Series

01/17 Kolding, REDO
02/17 Bengaluru, Letters to the Future
03/18 Paris, To get there: designing together
04/18 Wuxi, Diffused Transition & Design Opportunities
05/19 Rovaniemi, Around the Campfire – Resilience and Intelligence
06/19 Bogotá, The Design After
07/21 Rome, Design Culture(s) Volume #1, Volume #2
08/23 Guayaquil, Arts imagining communities to come
09/23 Detroit, Design for Adaptation
10/23 Antwerp, Connectivity and Creativity in times of Conflict

Academia Press
Coupure Rechts 88
9000 Gent
België

www.academiapress.be

Academia Press is a subsidiary of Lannoo Publishers.

ISBN 978 94 014 9647 6
D/2023/45/341
NUR 656/658

Kristof Vaes & Jouke Verlinden (editors)
Connectivity and Creativity in times of Conflict.
Cumulus Conference Proceedings Antwerp 2023
Gent, Academia Press, 2023, 783 p.

Layout: Keppie & Keppie

© University of Antwerp,
© Cumulus Association International Association of Universities and Colleges of Art, Design and Media.
© Kristof Vaes & Jouke Verlinden
© Lannoo Publishers

All content remains the property of authors, editors and institutes.

Preface

Connectivity and Creativity in times of Conflict - conference proceedings VI
Cumulus president's message - Design for Adaptation in Times of Complexity IX

Track 1
Nature positive/design for transformation 1

Editorial 2

Design methodology

Scenario-building through a systemic lens: a new perspective on tools and methods to design for sustainability transitions 4
Intimacy/integrity: a framework for thinking about epistemological styles in design activity 9
Democratizing design: the development of a 'Design for Do-It-Yourself' framework 15
The power of imagination: immersive and experiential counterfactuals to engage with sustainability 20
Applying human-centered system design to the development of a tool for service innovation 25
Pulse approach: integral design project management to empower transformative processes 30
Research on design sketch from different disciplines: overview and directions 35
Researching the invisible: troubling qualitative research design through information architecture 41

Design education

T+ designers: a case for transdisciplinarity in design higher education by way of a South African case study 46
Materiality, commons, and design education 51
Representing and shaping regenerative futures: a context-specific approach to art and design education. 58
Creative strategies for the learning spaces of the future 62
Implementing SDGs in a product design curriculum, or: the value of tap water 67

Design materialization

Yutaka: how do we prototype the transformative change towards nature positive designs with soil 72
Material experience: the future of material selection for product design 77
Discerning modes of design in ecological restoration 82
From visual to multisensory: how does intangible cultural heritage of traditional costume self-remodel in digital interactive environment? 87
Designing sustainable furniture: guidelines to promote furniture life cycle design 94

Biophilic approaches in design

Biophilic design for remote studying environments: analysis of case studies involving a collaboration between ergonomics and environmental psychology 98
Bioreceptive interfaces for biophilic urban resilience 103
Artificial nature: possibilities for mycelial composite material design 109
Botanical design: exploring the application of parametric plants in furniture 113

Eco-social transitions

Systemic Design Oriented Leadership (SDOL) – a co-created play for eco-social leadership development with the methods of Systems Thinking 118
Design for transformation: unlock competencies for coping complexity 122
Change agents: designers interpreting 'the social' and 'social' interpretations of design 127
The changing role of designers in transition processes 132

Fashion innovations

Fashion design matter: the role of design in guiding a sustainable transformation in Europe 137
Convincing fashion consumers to go green: a brand communication problem? 142
Prototype dialogues; re-balancing design thinking through negotiations with fabrics, form and future 148
Future fashion: new and ancient systems at the intersection of anthropology, ecology and innovation. 152

Urban design & citizen inclusion

Design fiction localised 158
Transit Oriented Development used to formulate design guidelines for an improved bus network in Malaysia 163
Exploring sustainable ecosystems in the "15-minute" urban living circle—take Shanghai Urban Space Season 2021 as an example 169
The Unified Citizen Engagement Approach: a design-oriented framework for involving citizens in the energy transition 174

Design & digitisation

Designing for Viral Infection Awareness through PLAYMUTATION 179
Gamifying the low impact customer solution design 183
Connecting to the future; using serious games and scenario development for responsible design 189
About utopias, apocalypses, respawning and zombies and how understanding images of space and time may inform design for sustainable behaviour 194

Track 2
Digital futures/hybrid reality 199

Editorial 200

New crafts and craftspeople

Fashion Craftsmanship 4.0. Learning experience about Industry 4.0 technologies for hybrid digital fashion-tech products, processes, and business model design 202
Crafting hybrid workflows for the design of augmented textile artefacts 210

Distance: digital immersive technologies and craft engagement 214
Notions of hybrid craft production: conversations and small-scale experiments in digital fabrication 219

Research through design in the cyber-physical era
Digital synesthesia in product design. Building a vocabulary of physical interactions for a sensible quantified self 223
Digital content that offers experience of listening to crystallized music 228
The body can not be thought: the 'disabled body' as a catalyst to develop new paradigms for human-computer integration. 232
Metaphysical Instruments: prototypes for hybrid and live music-making 236

Redefining the role of design(ers)
Virtual skin: co-creating 3D materials with synesthetic artificial intelligence 241
Cabinets of curiosities for the postcolony II: tokens: collections I-V 245
Speculating futures in an age of nostalgia 250
Computational thinking in design and fabrication for augmented and accessible museums. 254

Usability and performance of innovations
Usability and UX evaluation of an online interactive virtual learning environment: a case study of Wales' Virtual Hospital 260
Design perspectives for the future of work in Industry 5.0 environment: the digital and physical space in Augmented Reality uses 266
Assessing the impact of immersive versus desktop virtual reality shopping experiences in the fashion industry metaverse 271
A pilot study with the Shaper Origin to determine the learning curve of augmented fabrication 276

Design for and with extended reality
Introducing the material experience concept in the metaverse and in virtual environments 280
Balancing authenticity and creativity: A VR system design for assisting in ceramic creation. 287
What is the furniture in the Metaverse for? 292

Design for and with digital fabrication
Craft in the age of robots 299
Light it up: designing electronic textile with a light as a design material 304
Strategy for knowledge transfer in AM as a hybrid process chain towards a transition from prototyping to commercialisation 309
Speculative tinkering on circular design materials through 3D printing 317
Flaws as features, new perspectives for developing an additive manufacturing design language 322

The digital on urban scale
Designing smart product-service systems for smart cities with 5G technology: the Polaris case study 328
Fantastical reality: designing virtual urban space through extended reality 333
The Metapolis – cities between a ripple and a blur 338
Towards data activation and engagement within a smart city 345

Technology driven design education
Teaching design of technologies for collaborative interaction - an emerging pedagogical framework 349
A mixed-method approach: virtual reality to co-create future higher education workspaces in a post COVID-19 academic environment 357
An attempt to integrate AI-based techniques into first year design representation course 363

Digital fashion
The emperor is naked: deconstructed materiality in fashion NFTs 368
Dematerializing fashion- improving design-led sustainable and hybrid retail experiences via digital twins 372
Fashion archive as a meta medium: unfolding design knowledge through media technologies 379
Fashion and the metaverse: from omni-channel to direct-to-avatar 384

Track 3
Handle with care/inclusivity 389
Editorial 390
Design for/as communication
Encouraging humanitarian assistance in conflict zones through animated public service announcements 392
The design of an engaging focus group discussion toolkit involving school-aged children following urotherapy 397
Inclusive Transformation of age-friendly communities based on digital technology support 402
Taking care of the elderly through the tools of the animated communication design: a useful and ethical imperative 408
Pee poo period. Exploring the intersection between shame, bodily fluids, and sustainable design 413

Design for diverse users
Feminist value sensitive design of self-tracking technology based on female body data 419
Spatial "mutual altruism" as a relationship of care for homeless people. How design impacts social re-integration 425
I'll be there for you: exploring a sense of belonging to enhance student engagement 429
Inclusive design in the context of performative gender through product form 433
Landing the internship: the role of gender in finding ID internships 438
Object as the tool of recovery - Examining material culture of young refugees in Hungary for trauma processing 443
The food delivery industry and its lack of care in gender equality: the speculative case of 'GiGi' 448
Winning at more than a game! A storytelling board game concept to raise awareness about refugees' language barriers 455

Care(ful) spaces
Cities for all: co-design interventions on urban features using inclusive technology 461
Separating Ccovid from non-covid: spatial adaptations in existing hospital buildings 466
Wayfinding is caring 471
Explore vacant public spaces regeneration to facilitate minor's activities and education under inclusive design principles 475
Human-space relationships as narrative processes for inclusivity 480
Urban darkness: human experience of atmosphere and fear 485
Daily social interactions of hawkers as a catalyst to actuating bottom-up spatial justice: experience from Hong Kong 489
The city of care through walkability and proximity. Researching on and with Generation Alpha on urban walkability assessment 494
Hinges, passages and comfort 499
Renewal of urban ecological transportation network based on inclusivity design — Take Sydney's "Livable Green Network" plan as an example 504
How to take care of the Antwerp modernist social housing of Alfons Francken? And how do this housing blocks take care of its changing population? 510
Inclusive innovation: a study of creative furniture design for urban community public space 515

Co-creating care(ful) design
Health, care and prosthetics: co-design methodologies in the case of autofabricantes 519
See the unseen: a co-creation design process for children with incarcerated parents 524
The power of photovoice: AI support provides voicing opportunities for children in sex education 529
Co-design for the common good: a holistic approach to workspace projects 533
Co-designing neighbourhood identities. How to share memories and experiences towards a common sense of belonging 538

Design(ers) & learning
Universal design for learning as an inclusive teaching methodology for an African art and culture course in Ghana 544
Material-led thinking as a practice of care: a strategy from art and design education 550
Artful care for self and others in daily design practice 555
Material metaphors: method for physicalising relations and experiences 560

Design ethos
A South African approach towards a caring design practice 565
Weighing the tensions of nostalgia, necessity, and care in contemplating the future of the Nigerian design-scape 570
Food as a form of care: designing social innovative processes and practices 575
Designing with posthuman kinship: from posthuman theory to human-non human collaborative design approaches 580
Beyond empathy: how curiosity leads to greater care 585

Inclusive approaches to intangible cultural heritage
Convention versus contemporaneity: the affordances of design-led mediation towards sustaining an ancestral cycle of linen making in Castelões, Portugal 590
Combining care for planet, people and culture towards circularity 594
Media art creation process using digitized archetype of Korean traditional dance movement 600
Envisioning design strategies for intangible cultural heritage activation 604

Sustaining traditional crafts and techniques
Craft for care, design for life. Heritage contemporary enhancement and communication design tools as a resource for social changes, fostering diversity and inclusion 610
Embroidered heritage: a design-led visual ethnography of traditional Palestinian motifs 615

Adaptation of the built environment
Design for Ukraine's heritage: engaging international students during times of war through design activism 619
The technical compatibility of vertical greening with built heritage 624
New design models for proximity retail and senior inclusion 628
Investigating spatial patterns of green infrastructure at built heritage sites in Antwerp, Belgium 632
From architecture to community: adaptive reuse as social practice 636

Participation and role of communities
Methodology and evaluation of digital assets reconstruction of cultural heritage with visitor participation in museum 642
Community heritage: an immersive approach to disaster resilience 646
Caring for human diversity and built heritage through design: a multiple case study enquiry 651

Poster abstracts 656
Adding value to the future through design and entrepreneurship: PLACE 657
A video game for emotion regulation of medical students 658
Video game design for ecological impacts 659
Dwell and move, change ensues 660
Transposing timelines 661
Artificial intelligence-aided type design for Chinese script 662
Design and reconstruction of the new interest youth community in china in the post-epidemic era 663
Sound E-scape: an interactive, digital application for music therapy and soundscape generation 664
Development of existing biophilic interior design definition 665

Design-driven approaches to human augmentation. An exploratory study 666
Designing with people: creating a multi-level interdisciplinary design education environment for more inclusion 667
Material connotations: meta-structure research of practice based projects with invasive species plant waste 668
From collecting natural objects to presenting the future anthropocene: exhibition design for the anthropocene theme in museums 669
Catacombs: refuge on the border of the virtual and the real 670
Hybrid specimens: Phygital artefacts at the intersection of analogue + digital crafts 671
Content management system in mapping movable objects 672
FlavourGame: interaction design in hybrid games 673
Bibliometrics in circular design visual representation 674
Inclusivity as a hype phenomenon in advertising 675
Inclusion in recruiting 676
Values, design and educational project: contemporary projections 677
Project Hope : the creative revolution mural, a human singularity approach 678
More-than-human ways of thinking through felting wool 679
"Care strategies to strengthen heritage structures as a community asset during the pandemic: the case of Bahay Nakpil-Bautista" 680
A novel offloading insole system designed for healthcare 681
Towards an embodied expression of pandemic nodes & networks in the age of social distancing 682

Cumulus Phd network 683
Evolution of 'Mashrabiya' in the Middle East & North Africa - traditional wood carving technique revival 684
Exploring the potential of material innovation to revitalize traditional crafts in Egypt 687
An overview of design suggestions for contemporary theatrical VR productions 690
Polymath interpolation in transdisciplinary open-ended design – design for conservation 693
Implementation of design culture as a strategic innovation through design-oriented industrial conversion and product diversification 696
Sustainable transformation of age-friendly community centres based on transition design 700
Parametric Joinery. Development of a system of configurable joints 704
Designing a ward inventory for a sustainable healthcare. Framework for healthcare providers of configurations among disposable medical devices, clinical procedures, and medical equipment in the neonatology department. 707
A safe space of creativity-designing with vulnerable female communities 711
The direction of wayfinding. From the identification of a place to the expression of its meaning. 715
Human augmentation: the role of design in the design of on-body interfaces for cognitive-sensorial wellbeing 718
A conception toward design narratives for innovation 721
Home away from home - The role of design methods in processing trauma of forced migration and loss of place 725
Decoloniality and healing: confronting inter-generational trauma/ideologies through architectural preservation and education 728
The ephemerality of an organic material and its implications: a context specific study with invasive exotic species (Japanese knotweed) waste in Genk, Belgium 731
Visual communication bridging intercultural barriers 734
Feeling the future car: designing for driving pleasure in the era of co-driving 737
Mediterranean landscapes in emergency: nature and culture 739
Key Performance Indicators for measuring and evaluating users' sensory perceptions and behaviors in learning spaces in higher design education 742
Textile handcraft making and women creators' psychological well-being: a narrative review 746
Cross-case analysis on the integration of extended reality (XR) with the design and planning of the built environment 750
Ecosystem services: an interpretive paradigm of urban and territorial heritage. Strategies, guidelines, and vision for sustainable cities 754
Characteristic analysis of future-oriented design based on cognitive context theory 757
Digital wellbeing and design 760
Appropriation and appreciation of Austrian and Indonesian puppetry 763
Reinventing the gastronomic experience: using interactive digital environments to raise awareness of food-related cultural heritage 766
Developing cultural heritage sustainability from the perspective of participatory sentimental souvenir design 770
How does design intervention promote sustainable rural transition: an analytical framework based on the multi-level perspective model 774
Designing future hybrid creative space using digital tools in educational institutions and organizations 777

Reviewers 781

CONNECTIVITY and CREATIVITY in times of CONFLICT

Track 1

Nature positive/ design for transformation

Nature positive/Design for transformation

Bob Geldermans[1], Alexis Jacoby[2], Els Du Bois[2], Ivo Dewit[2], Dirk Van Rooy[2], Mario Rinke[3], Bert Belmans[4]

[1]Interior Architecture, Faculty of design sciences, University of Antwerp
[2]Product development, Faculty of design sciences, University of Antwerp
[4]Architecture, Henry Van de Velde, Faculty of design sciences, University of Antwerp
[4]Energy and Materials in Infrastructure and Buildings (EMIB), Faculty of Applied Engineering, University of Antwerp

Introduction

The Track Nature Positive/Design for Transformation started off with a few big questions: Even if we are technologically able to do so, are we still allowed to create our designed environment as we see fit? How can we navigate through sustainable transitions and within planetary boundaries? Can a systemic lens help us creating an overview to better overcome the present and imminent future conflicts? And can we regenerate ecological and social damage done? Indeed, the futures we want tomorrow are enabled by the actions we take today. Shaping societies, industries, buildings, products, and behaviours is a task to tackle by those able to cut across different disciplines and become agents for change. A call out to designers around the globe to put nature positive transformation at the heart of their actions. Many of them have responded within the framework of this Cumulus Conference.

We received 150 abstracts that, after a double-blind review process, resulted in 37 high-quality academic papers. Furthermore, out of 17 workshop proposals, 5 were selected for the conference. In addition, the program for our track includes several visual papers and posters. 8 themes were identified that determined the final division in paper sessions.

The attention for ***Design Methodology***, a theme to which 2 sessions were allocated, is not surprising, since existing methods and tools are to be critically assessed with respect to the challenges we face. The envisioned transformation concerns a large-scale systems integration of deep ecology strategies, which is a complex endeavor. Departing from the notion that current design approaches are incapable of dealing with *uncertain* conditions of critical complexity, as argued by an increasing number of scholars (Ceschin & Gaziulusoy, 2016), we need to break away from attraction to *existing* systems and values. At the same time, high levels of complexity pose new questions concerning ***Design Education*** (Meyer & Norman, D2020), which comprises another theme within our program. Philosophical and pedagogical concepts concerning design education are discussed, as well as the role of the physical learning space. Trans-disciplinarity is put forward as a mode of collaboration that looks beyond bridging divides in academia, engaging directly with external sources of knowledge. Internalizing environmental and social awareness has inherent material implications. A third theme has thus been dedicated to Design Materialization. Within this theme, the future of material selection for products and interior design is discussed, amongst other topics. Enhanced guidelines for Life Cycle thinking are addressed in one of the papers, making the connection with circular material use: a hot topic in practices and policies alike. The act of repairing and caring for living systems in truly *restorationist ways* is closely connected to this, but often neglected in simplified circular concepts towards material use. The theme of ***Biophilic Approaches in Design*** elaborates further on such notions of restoration. Bio-receptive Design, as an example, embeds living organisms in design processes through the creation of materials and artefacts, whilst connecting design and biology. In another article, boundaries between living and non-living are pushed through the parametrical control of plants in the creation of furniture. As such, the biophilic approach centers on both local and global human/nature relationships (Kellert, Heerwagen & Madort, 2008). Other perspectives on those human/nature relationships are brought to the fore in the theme ***Eco-Social Transitions***. Here, the concepts of systems thinking, and co-creation have been connected to leadership and business, for example. One paper takes the role of Design as central to sustainable change processes, underscoring the transformative power of the designer to unlock solutions by sequencing seemingly distant dots and generating new meanings. One theme has been allocated completely to ***Fashion Innovations***. The diversity of angles varies from negotiations with fabrics, form, and future for re-balancing design thinking, to issues of greenwashing and brand communication, and from the importance of indigenous textiles and know-how to difficulties in changing unsustainable lifestyles. Although we have grouped these articles into one topical session, it can be observed that challenges and opportunities are in many ways overlapping with those in other fields of design. From that perspective, also the urban scale shows parallels, based on the rationale that human-centric approaches transcend scales through conscientious contextualization, as can be found in the session on ***Urban Design and Citizen Inclusion***. Time-limited planning of urban living circles, for instance, reconnects the physical proximity of urban residents with basic daily needs, such as food, health, and education. This gives way to slower means of traffic, such as walking and cycling, whilst reducing negative effects to human well-being, climate, and the environment. A similar scope can be found in yet another research, in which an innovative form of development is proposed to radically change the urban landscape in favor of a human-centric approach, by means of a quantitative measuring method. End-user in-

clusion is also central to a paper on Do-It-Yourself studies to establish new 'partnerships' between products and users. This can be filed under the act or process of *democratizing design*. And that aspect seems to join the various tracks within this Cumulus '23 Conference: no matter from which way one approaches it – nature positive, inclusion and care, hybrid realities, or otherwise – the *human scale* is paramount for understanding contemporary challenges and finding solutions. Talking of new methods to facilitate this, the digital world is never far away. The theme ***Design & Digitization*** showcases assets of computation regarding the shift from a degenerative societal paradigm, to a regenerative one. For example, through serious gaming to create awareness, understanding, and – ultimately – behavioral change. To increase imaginative capabilities, less conventional methods have been proposed for approaching unsustainable behavior. One study does not shy away from using dystopian futures, fantasy-scape, and even zombies, exploring new ways of inquiry and how (sub) conscious perceptions of time and space affect people's beliefs and the choices they make.

Choices made through design should always be 'nature-positive'. The opposite is no longer viable. If there is anything this selection of papers shares, it is that: in the transition we are all agents of change.

References

Ceschin, F., & Gaziulusoy, I. (2016). Evolution of design for sustainability: From product design to design for system innovations and transitions. *Design Studies, 47*, 118–163. https://doi.org/10.1016/j.destud.2016.09.002

Kellert, S.R., Heerwagen, J.H., & Mador, M.L. (2008). *Dimensions, Elements, and Attributes of Biophilic Design*. John Wiley & Sons.

Meyer, M. W., & Norman, D. (2020). Changing Design Education for the 21st Century. *She Ji, 6*(1), 13–49. https://doi.org/10.1016/J.SHEJI.2019.12.002

Design for transformation. Unlock competencies for coping complexity

Mariana Ciancia[1], Marco Ronchi[2], Serena Ballabio[3]

[1]Department of Design - Politecnico di Milano, Italy
mariana.ciancia@polimi.it
[2]School of Design - Politecnico di Milano, Italy
marco.ronchi@polimi.it
[3]Twig, Italy
serena@twig.design

Abstract

After almost three years since the Covid outbreak, the structural damages the pandemic wreaked are finally becoming more evident than the death toll. A growing crisis that affects the public sector, families, and companies is anticipated by failed businesses and routines that have been disturbed by the fear of the invisible. The university enters this situation as a strategic place for research and a training ground for experts who will steer the transformation.

Grounded on a vision of design as a force of change, the Imagis Lab research group has investigated the different meanings of "design and transformation" since 2015, probing the transformative skills of distant professional worlds. The focus has been on understanding design's role in promoting change processes. So to know how to be a human and professional anchor capable of activating contemporary, sustainable and long-lasting organisational change.

The first part of the paper will provide a description of the main actions and insights from the Research Through Design approach. The research, started in 2018 and still ongoing, begins with an insight: digital transformation is human-driven. This a statement that prompted us to investigate the role that design, marketing and communication can play in organisational change processes. The second part of the paper is devoted to presenting the reflections on the transformative competencies inherent to the design practice, among which are: emotional agility (listening for self and others); leadership (motivation for self and others); creativity (breaking from automatism and identifying an actual solution); storytelling (insight and creation of new meanings).

As a result, we propose to look at the design(er) as a figure able to challenge contemporary complexity (strategy) through active listening and empathy (human-driven approach) for identifying contemporary solutions (marketing, product, and service) developed by sequencing seemingly distant dots (design) and conveyed through new meanings (storytelling).

Author keywords

Design for transformation; Design attitudes; Soft competencies; Emotional Agility; Leadership; Creativity; Storytelling.

Introduction

Almost three years have passed since the Covid outbreak, and the structural damage caused by the pandemic is now emerging clearly beyond the death toll. Failed businesses and routines disrupted by the fear of the invisible anticipate a progressive crisis that strains public administration, families and businesses. Into this scenario comes the university, which, on the one hand, stands as a privileged place for research; on the other hand, it prepares professional figures to lead the transformation (Stolze et al., 2018; World Economic Forum, 2020). In this technological, economic and social evolution context, digital transformation emerges as an increasingly relevant and unavoidable phenomenon in the business landscape (Kane et al., 2015). Suppose we understand Digital Transformation (henceforth DT) as a process enabling a major cultural transformation (Kraus et al., 2022). In that case, there emerges the need to understand how design, marketing and communication become crucial areas of a process that involves people first and foremost.

Our work aims to define how the practice of design emerges as an indispensable asset for developing cultural transformation within companies and what are the competencies of this new type of consultant: the designer for transformation.

Design (Manzini, 2015), marketing (Kotler & Keller, 2009) and communication (Jenkins et al., 2013) have historically been levers for reaching and engaging audiences. The difference from the past is that today, with the implementation of digital technology, they acquire a renewed ability to respond to audience needs. They become natural enablers in organisations' transformation processes because of their ability to collect and interpret data by understanding the target audience's needs and intervening directly in the relationship between supply and demand (Ronchi et al., 2020).

Main actions and insights coming from the Research Through Design

Grounded on a vision of design as a force of change (Design Council, 2021), the Imagis Lab research group has investigated the different meanings of "design and transformation" since 2015, probing the transformative competencies of distant professional worlds. The focus has been to understand the role of design in fields where the "know-how" connected

to a specific aim gives way to "knowing how to orient" in the unknown. So to know how to be a human and professional anchor capable of activating contemporary, sustainable and long-lasting organisational change.

Step 1 - Digital evolution pushes the transformation

In light of such premises, a scenario emerges in which the ubiquitous incorporation of the digital everywhere brings the entire market system facing an inevitable transformation. The consequence is that economic and social changes enormously alter the mediascape (Appadurai, 1990), pushing society toward a scenario in which relationship becomes a key element of communication and market innovation mechanisms, especially in its newer forms. In this sense, the shift from multichannel to omnichannel paradigm and digitization (Bloomberg, 2018; Mazzone, 2014; Rogers, 2016; Westerman et al., 2011) revolutionised outcomes and also work processes in many fields of application. Suppose we strive to read the contemporary in these terms. In that case, DT presents itself as a process of the evolution of business culture and a re-interpretation of the tools available to the enterprise.

These reflections prompted us in 2018 to investigate the role design, marketing, and communication can play in organisational change processes. The output of this first phase was a book that allowed us to focus on the insight that guided the research's development: DT is human-driven. Then, the main evidence was the understanding that to activate a DT, we must first activate a listening process. Therefore, figures who can listen, translate the needs gathered and mediate this information with the technology, and business aspects are needed.

From which a series of assumptions were then detailed:

- DT is a process of identity evolution;
- DT is a process of changing managerial culture;
- DT is a reinterpretation of the tools available to the enterprise;
- DT directly impacts people, and this determines the real revolution.
- DT is NOT a simple implementation of digital technology within business enterprises.

Step 2 - Focusing on design opportunity

From these insights, we wondered what the role of design and designer could be within the DT processes that become value-driven and human-driven.

Then, in 2019 we started to investigate the characteristics of the designer who leads the transformation, with the identification of the design opportunity: what characteristics enable design(er) to activate and lead the transformation?

Therefore, we decided to conduct experiments carried out in collaboration with different companies, applying a Research through Design (RtD) approach (Frankel & Racine, 2010; Frayling, 1993) that involved the collaboration of different stakeholders: researchers, practitioners, companies and students from the School of Design were involved in educational and design experiences that applied co-design methods (Björgvinsson et al., 2012; Sanders & Stappers, 2008) and open innovation (Chesbrough & Bogers, 2014).

All the experimentations allowed us to identify the design practice as an attitude to change. A design attitude, capable of fostering a cultural change and a new mindset that integrates design, techne, leadership and emotional intelligence: what we identified as competencies for transformation, investigated in the next step.

Step 3 - Design competencies for transformation

In 2020-2021, we focused on understanding the competencies potentially stimulated by design education curricula and professional pathways, following the adoption of the knowledge, skills, and attitudes model (henceforth KSA's Model) (Bloom, 1956; Krathwohl et al., 1956) for mapping human competencies and supervising three Master's theses on the topic.

The pathway stems from an in-depth study of the digital transformation process of the Italian business unit ABB Sace, a leading multinational company in the technological sector, carried by the design agency *Twig* (www.twig.design) between 2016 and 2019. In 2020, Giulia Sormani and Marco Ronchi were interviewed several times by Professor Paola Caiozzo, co-founder of the Commercial Excellence Lab (CEL) at SDA Bocconi. They illustrate with which mindset the organisation of processes, roles, skills, tools and actions was rethought: it emerges how much design has been recognized by the sponsors of the transformation as a discipline with a high contribution to agility and complexity resolution. Several questions emerge from the debrief, including those related to the distinctiveness of design dealing with organisations' transformation:

- What are the differences between a design-driven versus a technology-driven or economy-driven transformation?
- What competencies does design bring to make its contribution to transformation unique?

If we talk about design's authority:

- How fully is design recognized as a discipline capable of managing a transformative process?
- Why does the (Italian) market struggle to recognize the designer's governance of a transformative process, but more so its execution?

If we talk about design awareness:

- What prevents design from dialoguing at an equal strategic level with the (Italian) engineering, technology or business communities?
- Are there moments of organised awareness within design education pathways that allow young designers to question the transformative capabilities of the discipline and the strategic-executive ones?

The connection of Imagis Lab with Paola Caiozzo confirms the importance of involving a scientific community external to design and intrinsically linked to management and business organisation. Of all the areas explored, what forms the basis for further study is the common need to understand what competencies made design peculiar to change in an organisation with a strong engineering culture.

The master's thesis of Alice Cassanmagnago (2020), deepened the previous reflections of Bartram and SHL Group's model "The Great Eight" (Bartram, 2005; Bartram et al., 2002) within a methodological and cultural excursus that 1) analyses the competencies of the designer through the eight domains presented in the model, 2) selects among the 112 listed competencies those most consistent with its figure, and 3) classifies them into:

- Core competencies: the "know-how" classically acknowledged to design;

- Strategic competencies: the "knowing how to be," not yet fully recognized to design;
- Transformational competencies: "knowing how to change," not recognized to design.

The mapping activity highlights significant areas of overlap with the disciplines historically devoted to business management, identifying planning, listening, and collaborative approach as the distinctive characteristics that form the basis for the subsequent investigation of design's "transformative attitudes." Not forgetting all those "know-how" skills already recognized.

Then, Marco Ronchi and Serena Ballabio continue the investigation by supervising two more theses, focusing the insights of the first investigation into areas of high transformative need:

- The thesis of Filippo Collura (2020) investigates the role of the designer in sustainability-related processes using the framework previously developed by Alice Cassanmagnago (2020), and focusing on what skills can contribute to the adoption of effective circular economy processes. The dissertation 1) analyses models from The Circular Design Guide (*The Circular Design Guide*, n.d.), research from Delft University of Technology, and the Cyclon case study; 2) links insights from these sources with to the transformative skills identified in the previous dissertation; and 3) proposes a new tool aimed at design practitioners with an aptitude for sustainability. The result is a useful tool for navigating within circular economy processes and understanding how design skills can make an effective contribution to the development of circular economy processes: the *Design(er) for Sustainability Framework*.
- The thesis of Giorgia Calloni (Calloni, 2021) investigates the needs of the third sector in Italy through a side-by-side journey with the *Cooperativa Rapsoidea*, committed to solving the educational emergency triggered by the first wave of the Covid-19 pandemic in the province of Bergamo, Italy. The cooperative's mission is to build co-design experiences with different stakeholders in the area, pushing young people to take charge of the territory's needs by exploiting and investigating the possibility that the discipline of design supports them in the construction of their "life project". In this case, the output is the ETS Partnership activation toolkit: a tool aiming at guiding social workers in engaging third-sector entities, engaging youth, gathering needs, forming a group for the related development of design responses, and using a design-driven approach.

Step 4 - Humans through transformation

At the end of 2021, the collaboration with Cooperativa Rapsoidea took a specific shape during the Final Design Studio in Communication Design involving design students, local youth and stakeholders from the province's social, cultural and productive fabric of Bergamo.

Twenty-five young designers were provided with the basis for investigating the transformative competencies previously identified in themselves. Then, after framing the concept of competency, the students were asked to step into the shoes of coaches and facilitators of 20 youth from the area (aged 16 to 19), guiding them in listening to the needs of stakeholders and redesigning some symbolic places in the area:

- Stimulating in themselves the skills preparatory to activating, orienting and guiding a transformation process;
- Transmitting these competencies to youth who have never studied or heard of design, without directly contributing to the solution but exclusively transferring mindset and method (design thinking) to them.

At the end of the four-week course, students analysed their experience and skills through a questionnaire based on "The Great Eight" model to make them reflect:

- Whether in their undergraduate design journey, they had ever been aware of or had ever been placed in the conscious condition to question the above transformative skills;
- Whether in their undergraduate design journey, they had ever been trained explicitly on the transformative skills that emerged;
- Whether prior to the just-completed co-design experience, they felt that they were naturally predisposed to some of these skills;
- Whether, after the just-concluded co-design experience, they felt that they had activated some of these previously dormant skills;
- Whether they had questioned the importance of one or more of these competencies for their professional future.

Future framework for contemporary transformation

Through our experiences in the field and analysis of data from open innovation in education, we have identified three key moments in the design process in which transformation is enabled:

- Needs: design formalises the ultimate purpose of transformation (meaning), traces the processes to activate it (systemic vision) by placing human needs at the centre of inquiry (empathy);
- Competencies: design identifies externally (designers) and internally within the organisation to be transformed (internal stakeholders) the competencies (knowledge, skills and attitudes) needed to initiate and guide the process;
- Community: design creates moments of shared design (co-design) that enable designers to stimulate the transformative attitudes naturally present in internal stakeholders (engagement), transferring the design mindset (culture).

In particular, the area of "competencies" emerges as a moment to be further explored. Indeed, we understand that a better classification of competencies based on the continuous exchange and contribution from other fields can offer our discipline a different positioning towards managers who choose the path of transformation.

From this value proposition comes a new self-awareness framework dedicated to those who want to transform and those who want to support people that are getting things done. A tool based on four specific attitudes that design inherently promotes in the development of what we call "transformative courage," through:

- Listening to the self and the ecosystem as a whole (emotional agility) (David, 2017; Siegel, 2020), e.g. showing empathy and dealing with ambiguity;

- The search for purpose is what nowadays unites distant worlds (leadership) (Bruttini, 2007; Grant, 2013), e.g. making decision and motivating others;
- The breaking of automatisms and devising contemporary solutions (creativity) (Brown, 2019; Kelley & Kelley, 2015); such as analysing, evaluating information and thinking broadly;
- Identifying and constructing new shared meanings (storytelling) (Hansen, 2020; Roche & Sadowsky, 2003) in terms of negotiation and proactive communication.

These four fundamental competencies can be used transversely in design-driven transformative processes. However, they emerge in different proportions depending on the design process stage and the designer's characteristics leading the process. Whenever a designer addresses a path of organisational transformation in which the impact of change is primarily about people and their involvement, it happens systemically.

We understand through empirical observation in the field that the moment the designer comes alongside the ultimate target of the transformation–the user who will experience the outcome–he or she can decree the commitment and evolution of the process itself.

Figure 1. Visualisation of the 4 design attitudes across the double diamond in the design-driven transformative processes.

Final reflections

Historically, polytechnic culture has been credited with a multidisciplinary approach of intersections and tangencies between art, technology and humanistic culture, methods and technologies. Today, however, becoming a designer is not just about having acquired these skills and having gone through theoretical and design experiences: it is not (only) so much about "knowing how to do something better than others," but rather about "knowing how to stimulate in others what they have best to give," thus "knowing how to be without allowing for knowing how to do," interpreting contemporaneity and its scenarios, enabling the space and rhythm where others carry on the path according to their vision, while respecting their own identity and ability to contribute to the evolution of the ecosystem. The technical and tactical approach is fundamental. However, suppose we want to grow a new generation of designers "with transformative courage" to face the challenges of the contemporary world. In that case, we need to complement the technical skills with an expansion of the strategic ones that enables them to have a systemic vision by going beyond the strong pragmatism of Western culture (Morin, 2001).

In light of such premises, our purpose as a design research group is to propose the design(er) as a figure able to challenge contemporary complexity (strategy) through active listening and empathy (human-driven approach) for identifying contemporary solutions (marketing, product, and service) developed by sequencing seemingly distant dots (design) and conveyed through new meanings (storytelling). According to this, we must continue to promote and investigate these four aptitudes in the form of a framework.

To conclude, our goal for 2023 is to present and test the framework based on these four domains, which is useful 1) to design students as a pathway to self-awareness, 2) to business and public administration managers as a professional engagement tool, and 3) to designers themselves, to support the positioning of this new design attitude for transformation.

References

Appadurai, A. (1990). Disjuncture and Difference in the Global Cultural Economy. *Theory, Culture & Society, 7*(2–3), 295–310. https://doi.org/10.1177/026327690007002017

Bartram, D. (2005). The Great Eight Competencies: A Criterion-Centric Approach to Validation. *Journal of Applied Psychology, 90*, 1185–1203. https://doi.org/10.1037/0021-9010.90.6.1185

Bartram, D., Robertson, I. T., & Callinan, M. (2002). Introduction: A Framework for Examining Organizational Effectiveness. In *Organizational Effectiveness* (pp. 1–10). John Wiley & Sons, Ltd. https://doi.org/10.1002/9780470696736.ch

Björgvinsson, E., Ehn, P., & Hillgren, P.-A. (2012). Design Things and Design Thinking: Contemporary Participatory Design Challenges. *Design Issues, 28*(3), 101–116. https://doi.org/10.1162/DESI_a_00165

Bloom, B. S. (1956). *Taxonomy of educational objectives, Handbook I: The cognitive domain*. David McKay Co Inc.

Bloomberg, J. (2018, April 29). *Digitization, Digitalization, And Digital Transformation: Confuse Them At Your Peril*. Forbes. https://www.forbes.com/sites/jasonbloomberg/2018/04/29/digitization-digitalization-and-digital-transformation-confuse-them-at-your-peril/

Brown, T. (2019). *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation* (Revised, Updated edizione). Harperbusiness.

Bruttini, P. (2007). *Capi di buona speranza. Psicoanalisi della leadership*. Guerini e Associati.

Calloni, G. (2021). *Design, trasformazione e terzo settore. Progetto grafite e l'approccio trasformativo design driven* [School of Design, Politecnico di Milano]. https://www.politesi.polimi.it/handle/10589/183458

Cassanmagnago, A. (2020). *Il designer trasformativo. Mappare le competenze di una disciplina in evoluzione* [School of Design, Politecnico di Milano]. https://www.politesi.polimi.it/handle/10589/171340

Chesbrough, H., & Bogers, M. (2014). Explicating Open Innovation. In H. Chesbrough, W. Vanhaverbeke, & J. West (Eds.), *Clarifying an Emerging Paradigm for Understanding Innovation* (pp. 3–28). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199682461.003.0001

Collura, F. (2020). *Design(er) for Sustainability. Il progettista come figura necessaria ma non sufficiente per una transizione verso la sostenibilità*. School of Design, Politecnico di Milano.

David, S. (2017). *Emotional Agility: Get Unstuck, Embrace Change and Thrive in Work and Life*. Penguin.

Design Council. (2021). *Beyond Net Zero: A Systemic Design Approach*. Design Council. https://www.designcouncil.org.uk/resources/guide/beyond-net-zero-systemic-design-approach

Frankel, L., & Racine, M. (2010, July 7). The Complex Field of Research: For Design, through Design, and about Design. *Proceedings of the Design Research Society (DRS) International Conference*. DRS2010 - Design and Complexity, Montreal, Canada. https://dl.designresearchsociety.org/drs-conference-papers/drs2010/researchpapers/43

Frayling, C. (1993). *Research in art and design. 1*(1), 1–5.

Grant, A. (2013). *Give and Take: A Revolutionary Approach to Success*. Viking.

Hansen, H. (2020). *Narrative Change: How Changing the Story Can Transform Society, Business, and Ourselves*. Columbia Business School Publishing.

Jenkins, H., Ford, S., & Green, J. (2013). *Spreadable Media: Creating Value and Meaning in a Networked Culture*. New York Univ Pr.

Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D., & Buckley, N. (2015). *Strategy, not Technology, Drives Digital Transformation*. MIT Sloan Management Review and Deloitte University Press.

Kelley, D., & Kelley, T. (2015). *Creative Confidence: Unleashing the Creative Potential Within Us All*. William Collins.

Kotler, P., & Keller, K. (2009). *Marketing Management*. Prentice-Hall.

Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1956). *Taxonomy of Educational Objectives, Handbook II: Affective Domain*. David McKay Company, Inc.

Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. *International Journal of Information Management, 63*, 102466. https://doi.org/10.1016/j.ijinfomgt.2021.102466

Manzini, E. (2015). *Design, When Everybody Designs: An Introduction to Design for Social Innovation* (R. Coad, Trans.). MIT Press.

Mazzone, D. M. (2014). *Digital or Death: Digital Transformation - The Only Choice for Business to Survive, Smash, and Conquer*. Smashbox Consulting Inc.

Morin, E. (2001). *Seven Complex Lessons in Education for the Future*. UNESCO.

Roche, L., & Sadowsky, J. (2003). The power of stories (I): A discussion of why stories are powerful. *International Journal of Information Technology and Management, 2*(4), 377–388. https://doi.org/10.1504/IJITM.2003.004233

Rogers, D. L. (2016). *The Digital Transformation Playbook: Rethink Your Business for the Digital Age: Rethink Your Business for the Digital Age. Columbia Business School Publishing*. Columbia Business School Pub.

Ronchi, M., Ciancia, M., & Piredda, F. (2020). Design Practice for Transformation. *DIID. Disegno Industriale Industrial Design. Design 2030: Practice., N° 72/20:*, 144–151.

Sanders, E. B.-N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *CoDesign, 4*(1), 5–18. https://doi.org/10.1080/15710880701875068

Siegel, D. J. (2020). *The Developing Mind: How Relationships and the Brain Interact to Shape Who We Are*. Guilford Press.

Stolze, A., Sailer, K., & Gillig, H. (2018). Entrepreneurial mindset as a driver for digital transformation–a novel educational approach from university-industry interactions. *International Conference on Innovation and Entrepreneurship*, 806–XXI.

The Circular Design Guide. (n.d.). Retrieved 11 January 2023, from https://www.circulardesignguide.com/

Westerman, G., Calméjane, C., Bonnet, D., Ferraris, P., McAfee, A., & others. (2011). Digital Transformation: A roadmap for billion-dollar organizations. *MIT Center for Digital Business and Capgemini Consulting, 1*, 1–68.

World Economic Forum. (2020). *The Future of Jobs Report 2020. World Economic Forum*. https://www.weforum.org/reports/the-future-of-jobs-report-2020/in-full/infographics-e4e69e4de7/

Reviewers

Reviewers

We would like to thank all reviewers of manuscripts, posters, and workshops proposals fort heir valuable time and feedback:

Dickson Adom
Bilge Aktas
Jordi Alvarez
Inés Alvarez Icaza Longoria
Shady Attia
Valentina Auricchio
Andrea Bandoni
Bert Belmans
Lola Bladt
Miray Boğa
Joao Bonelli
Rinet Bosman
Fatima Cassim
Sara Codarin
Daniela D'Avanzo
Muriel De Boeck
Louis Debersaques
Ralitsa Diana Debrah
Karel Deckers
Haoyu Dong
Zjenja Doubrovski
Maria Emília Duarte
Sophie Elpers
Yonca Erkan
Mark Evans
Ian Garcia
Dirk Geldof
Verhoeven Gerrit
Miaosen Gong
Meiling Gong
Josiena Hermina Gotzsch
Piraye Haciguzeller
Carly Hagins
Jasmien Herssens
Marie Frier Hvejsel
Massimo Imparato
Olga Ioannou
Liene Jakobsone
Xu Jiang
Mirja Helena Kälviäinen
steinar killi
Thaleia Konstantinou
Natacha Lallemand
Thomas Litière
Zhenyu Ma
William Motsoko Makhetha
Stefan Martens
Alexandra Matz
Angel Daniel Munoz Guzman
Francesca Murialdo
Ian Nazareth
Cassini Nazir
Rafael Novais Passarelli
Anne Marleen Olthof
Natalie Ortega Saez
Yaren Palamut
Giulia Panadisi
Owain Pedgley
Pier Paolo Peruccio
Miroslava Nadkova Petrova
Sigrun Prahl
Annabel Pretty
Fabian Tobias Reiner
Mario Rinke
Ramon Rispoli
Jaron Rowan
David Sánchez Ruano
Francisco Javier Serón
Joselyn Sim
Ruth Stevens
Eva Storgaard
Archana Surana
Suzie Thomas
Annapaola Vacanti
Mathy Vanbuel
Sam Vanhee
Griet Verbeeck
Hélène Verreyke
Makoto Watanabe
Jan Wurm
Mariia Zolotova
Alessia Romani
Kirsten Scott
Madeline Sides
Kristof Timmerman
Massimo Bianchini
mario bisson
Els De Vos
Els Du Bois
Wouter Eggink
Angela Giambattista
Roberto Iñiguez Flores
Stefano Maffei
Satu Miettinen
Nicola Morelli
Lukas Van Campenhout
Dirk Van Rooy
monica Di Ruvo
Andreas Sicklinger

C3

This book contains academic papers and posters of the Cumulus Antwerp conference, held in Antwerp on 12-15 April 2023. The Cumulus community, designers, artists, and educators were invited to submit contributions on how culture and creative industry can offer resilience, consolation, and innovation models on human scale, in line with the conference theme 'Connectivity and Creativity in times of Conflict'.

The contributions were double blind reviewed in the tracks

1) Nature positive/Design for transformation,
2) Digital futures/Hybrid reality,
3) Handle with care/Inclusivity, and
4) PhD network.

GPRC
Guaranteed
Peer Reviewed
Content
www.gprc.be

9 789401 496476

Editors: Kristof Vaes & Jouke Verlinden