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DIGITAL SPECIAL ISSUE 1

Disrupting Geographies in the Design World

Proceedings of the 8th International Forum of Design as a Process

Alma Mater Studiorum — Università di Bologna

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Track 2

Intersectional Design for an Accessible and Empowering World

Social positions and identities are multiple and seek to reveal the interconnected systems of subordination that together influence people's life chances. Extending beyond gender-specific and empowering categories of social identity (youth, old age, disabilities, non-heteronormative sexuality, despised ethnicity, income, religion and more), intersectionality focuses attention on a variety of multi-level interacting social locations, forces, narratives, norms, factors and power structures that shape and influence human life.

Intersectionality is increasingly suggested an innovative design framework with the potential to advance understanding of, and action, on inequalities, by highlighting processes of stigmatization, but mainly to encourage a critical reflection to move beyond singular categories, foregrounds issues of equity.

The track intends to collect design studies and practices which include the perspectives and worldviews of people who are typically marginalized or excluded, in which social justice and equity can be understood as a way of transforming how resources and relationships are produced and distributed to ensure a dignified and ecologically sustainable life for all. It also aims to outline in which way the dimensions of time and space, fluid, changeable and experienced through our interpretations, senses and feelings, influence different kinds of knowledge, through a deconstruction of the conventional social orders of meaning. Possible topics include concepts of accessibility, empowerment and people autonomy.

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Intercultural Design Approach. Narrative Design for a Multicultural Society

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Abstract

As part of an increasingly multicultural society issues concerning integration and relationships between ethnic groups and different communities are receiving a great deal of attention in the social and scientific debate.

The skills of design can be made available as a tool to systematise this multiplicity, promoting an innovation respectful of diversity, comparison, and interaction between people and cultures.

This article concerns practical product design applications, that explore the relationship between multi-cultural society and cultural accessibility. Moreover, this contribution aims to reflect on which and how methodological strategies could be implemented within a design process that focuses on an intercultural approach.

A series of case studies of narrative artifacts capable of bringing different cultures together and making them recognizable to different users will be analysed with the lens proposed in the methodological overview.

Keywords

Multicultural society Intercultural design Culture-driven design Narrative products Cultural identity

Introduction

Stretching into the Mediterranean Sea, as a bridge between Europe and Africa, Italy has always been a land of migration, due to its peculiar geographical position, resulting one of the major countries for individual registration of new asylum seekers in Europe and in the world (UNHCR, 2022).

Then, as part of an increasingly multicultural society with a wide variety of lifestyles and cultural backgrounds – where the intertwining of lives and stories shape the territory and its material culture – issues concerning integration and relationships between ethnic groups and different communities are the subject of much attention in social and scientific debate. Especially in a society with a high level of immigration as in Italy¹, cultural diversity leads to new perspectives and new directions in different cultural fields, such as education, political and research agendas, museums (Nemo, 2015), art and design discipline.

As a result, a proactive way of thinking is required to create communication channels able to give value to people's experiences in relation to the territories they inhabit and their personal cultural identity. Identities that reflect a multitude of collective experiences, memories, and references that evolve constantly (UNESCO, 2009).

From a designing point of view, the rapidity and inexorability of these social changes impose an adaptation of educational and design practices, in order to effectively adapt accessibility policies aimed at the inclusion (social, cultural and economic) of people with a migrant background within territorial contexts often characterised by cognitive, affective and relational dynamics extremely dissimilar to personal cultural identities. In this context, the discipline of design can find diverse fields of experimentation and challenge, aiming to contribute through an aware and culturally evolved action able to narrate diversities, preserve identities and transfer knowledge through the objects that surround us "as a means to establish meaningful and emotional interactions" (De Mendeiros, 2014, p. 16).

Indeed, intercultural factors become important issues for the design field in the global and local economy (Lin et al., 2007), especially in the development of new products and services and in the definition of widespread graphic interfaces.

The skills of design can be made available as a tool to systematise this multiplicity, promoting an innovation respectful of diversity, comparison, and interaction between people and cultures Fig. 1².

Regarding the many levels of action at which design operates, it is possible to consider a wide variety of design contexts, including products, services, and strategies - not always strictly separated - for which design assumes the role of a multidimensional operational tool (Dal Palù et al., 2018).

Many of the products we use in our daily lives allow us to perform functions and satisfy needs in a various way related to different places and cultures, but performing similar experiences. Artefacts made from a local or global availability of materials and manufacturing techniques that have specific variations in different contexts, handed down over time and generations. Products, materials, and techniques, starting therefore from a common matrix, find specific declinations and create different traditions and customs.

According to the Atlas of migration, a report edited by the European Union offices, Italy in the last decades experienced strong immigration flows, resulting in approximately 5 million foreigners living in the country (Tarchi et

- 1

al., 2021).

Fig. 01 provides a graphic summary of several potential design initiatives for cultural accessibility that involve various intervention scales. Although it is by no means a complete list, it illustrates the variety of tasks that a designer might investigate and include in its approach.

The meanings that products assume need to be read in the process of dialogue between culture, design, and users (Moalosi & Popovic, 2006). This might enable designers to develop products that fit the cultural context of their users and translate and simplify the multiplicity of narratives and stories present in specific multicultural scenarios.

And in this perspective, it can be observed how a kind of new designer figure is emerging: an *intercultural-mediator designer*, able, by collaborating with figures from the social sciences, to navigate cultural complexities and create spaces of design interaction between one's own culture and foreign cultures, working on their mutual influence in the form of acquisition, fusion and overlapping³ (Nemo, 2016).

In an interesting analysis developed by Jan Carel Diehl in 2006, the influence of culture on product design comes to the fore in many aspects, which can be categorised into two main groups: practical and theoretical Fig. 2. In his study, he distinguishes seven areas regarding cultural diversity that can influence the development process of product design. The practical group is made up of elements related to the design process (methodology, procedures), design education (transfer of design knowledge among other cultures), strategic (business strategy and product marketing in other cultures), and designers (cultural influences on the designer himself). It is substantially based on the physical interaction between products and contexts (De Mendeiros, 2014). The theoretical group is made up of the elements of aesthetics (preference for design in different cultures), semantics (interpretation of design and function) and human-product interaction (the actual use of products in different cultures).

Methodology

Starting from the theoretical framework outlined by Diehl, the reflections explored in this contribution, which is part of an ongoing Ph.D. research project, concern practical product design applications, that explore the relationship between multicultural society and cultural accessibility, especially using an intercultural approach – a social transformative perspective that investigates the points of interaction between different cultures and tries to create new narratives around them. Moreover, we intend to propose a methodological strategy to be implemented within a design process that focuses on an intercultural approach⁴.

The development of this approach consists, given a design topic, in extracting distinctive *intercultural* markers⁵ from specific cultural contexts and then translating these characteristics into highly representative products or services (Lin et al., 2007). Starting from these reflections, we try to define a possible methodological process Fig. 3 that allows designers to develop effective intercultural projects.

Indeed, the designer within these processes assumes the role (direct or indirect) of a "pro-active mediator" of knowledge and experience: a facilitator capable, by collaborating with other disciplinary figures involved, of navigating cultural complexities and creating "safe spaces" (Bustamante Duarte et al., 2021) of interaction - participatory and iterative - during the entire design development cycle.

Soundaries between cultures are continuously being relativised and redrawn. According to the concept of interculturality, intercultural dialogue between two or more cultures in society is characterised by mutual understanding and respect, which results in mutual influence (Nemo, 2016).

In this contribution we try to stress the difference between cross-cultural and intercultural design. The term cross-cultural refers to "the communication process that is comparative in nature" (Ting-Toomey, 1999). This approach, more investigated also from a methodological point of view, underlines the differences between cultures adapting the design choices to these diverse features. The term intercultural. instead, refers to the interactive "communication process between members of different cultural communities" (Ting-Toomey, 1999). It focuses more on the reciprocal exchange of ideas and cultural norms. It is a more active and social transformative perspective that investigates the points of interaction between different cultures and creates a new design narrative around them.

The intercultural markers are elements that are most prevalent within a particular cultural group and are considered surprising and remarkable by another cultural group (Bruns et al., 2012). Such as aspects related to appearance, modes of interaction, associated values and meanings, rituality, material culture, gestures, functional and behavioural factors, etc.

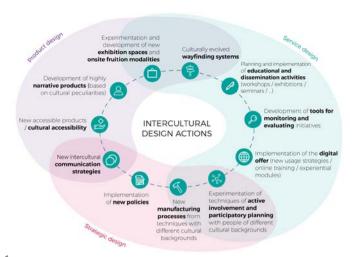


Fig. 1 Possible intercultural design actions. Credits: authors.

Fig. 2 Mapping of areas on cultural diversity and design, 2006. Credits: Jan Carel Diehl.

Fig. 3 Methodological approach. Credits: authors.

Fig. 1

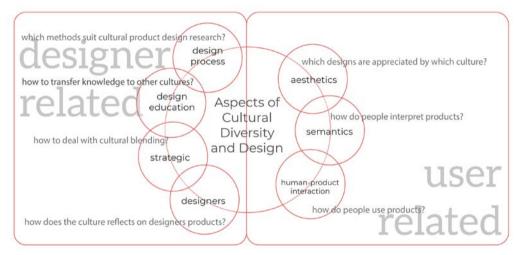


Fig. 2

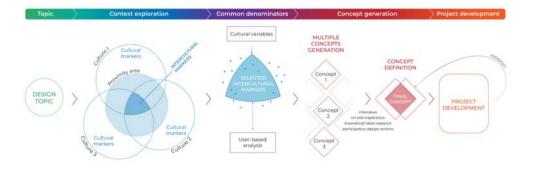


Fig. 3

And in the activation of these processes capable of generating projects that are aware of and truly based on intercultural dialogue understood as a reciprocal exchange of skills and expectations - the technical actions of involvement and inclusive approach typical of Participatory Design (Binder et al., 2012), as well as the adoption of certain qualitative methods derived from social research, come to the aid of these processes⁶.

The current considerations, developed by combining a review of existing literature related to intercultural design, are prevalently applied to the graphic communication sector (for instance, Lipton, 2002; McMullen, 2016; Radtke, 2021). This essay intends to extend these reflections to the field of product design, thus creating a more inclusive approach that seeks to embrace different scales of design intervention.

Context exploration. First of all, a careful analysis of the contexts and the stories related to the identified topic needs to be implemented, also mapping and analysing international case studies, where necessary, alongside the territorial analysis. The creation of this basic framework is essential to understand the subjective interpretations and the social role of the possible cultural behaviours referred to some specific elements present in the environment and to adequately know some key principles shared by the cultures that cohabit a specific area in order not to fall into conceptual blunders. Regarding the overall scenario, it would be important to be able to create a cross-disciplinary research approach (Muratowsky, 2016), involving other skills alongside that of design, such as sociologists and anthropologists, in order to be able to define a coherent and complete requirement system.

Common denominators. The second step consists in the identification of a common denominator system, which is represented both by the cultural markers (tangible, intangible or behavioural) shared by two or more cultures analysed – the aforementioned intercultural markers – but also by all those which, although similar in certain respects, take on nuances of meaning depending on the culture of reference (elements that we could place within an "area of proximity"). Based on these cultural features, in the construction of this scenario should be considered the overall environment such as economic and social issues, as well as the technologies available.

The different meanings that the identified cultural markers assume in the context of different cultures and the related social implications were further investigated. In this analysis, the designer needs to pay close attention to social and cultural variables that can radically influence the outcomes of the project, such as differences in behaviour, outlook, and values between people from different societies or cultural groups⁷.

So, based on the defined scenario and the relevant element extracted from the intersection and the connections between different cultural features, this step focuses also on a user-based analysis to explore the interaction between culture and technology, dialogue between users and designers, and understanding the user's needs related to the cultural environment.

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Such as, for instance,
participant observation,
discursive interviewing,
and focus groups (Dovigo,
2005).

G. Hofstede (1984) proposed four dimensions on which the differences among national cultures can be understood: Individualism, Power Distance, Uncertainty Avoidance and Masculinitv. Furthermore, E. Mever (2014), analysing how culture influences international business collaborations, has identified eight independent dimensions through which cultural differences can be conceptualized: Communicating. Evaluating, Persuading, Leading, Deciding, Trusting, Disagreeing and Scheduling.

Concept generation. This stage consists of the development of different conceptual responses through the definition of possible solutions and approaches through theoretical research, interviews, on-site inspections (where needed), feedback, discussions, participatory design actions. These concepts arise from the various combinations of the different intercultural markers, as defined in the previous steps.

Project development. Once the most representative concept has been defined, the project development starts, so from the preliminary design to the execution phase. In this methodological step, the quality check of the project (validation process) is also initiated by comparing the performances offered with the requirement system.

This re-evaluation operation allows finally to define the more appropriated concept – or a combination of some of them – and to start the development phase of the design process. This requires an understanding of how other cultures interpret images, layouts, colours, symbols, forms, textures, patterns, and other symbolic elements (McMullen, 2016).

Discussion about Intercultural Experiments in product design

The material and immaterial culture of a specific community, however, although rooted, is not a static entity, whose symbolic systems are limited to crystallizing into timeless objects.

A world in motion, made up of human migrations and shifting, also brings with its repercussions on value systems, on daily dynamics, and also on the world of design.

Humans carry with them their intangible assets, their worldviews and, in some cases, even some objects of daily or symbolic use. Italy, and more in general the Mediterranean basin, has always played a crucial role in this scenario, as a middle sea and a place of exchange and confrontation (Tosi et al., 2015).

In this section, we will discuss some case studies of intercultural projects to reflect on the strategies and approaches applied by designers, who internalize values and meanings of cultural contexts and try to redesign traditional objects from their point of view.

We decided to adopt a qualitative research framework, collecting data from various documentary sources (research articles, project reports, official designer websites, etc). It has been limited to a specific sector that seems to be almost "naturally" suited to intercultural experiments: the food topic.

The design about and for food should be expected to play a prominent role also in cultural and intercultural processes: food and eating are symbolical parts of a social system, they address rituals and belief systems (Bruns et al., 2021). They represent a valuable opportunity for the exchange of memories, knowledge, and stories, as well as for the development of intercultural skills. Through the analysis of cultural habits and consumption practices, it is possible to understand a series of meanings associated with the production of identities, the establishment, and maintenance of social relationships, as the cultural changes in society.

8
MTic-design is a knowledge exchange program between The Netherlands and Colombia seeks to develop innovative products together and to share and create design knowledge for both professional and educational purposes. Reference:
MTic official website, http://mtic-design.nl/project/ (consulted data: august 2022).

A series of case studies of narrative artifacts capable of bringing different cultures together and making them recognizable to different users were analysed with the lens proposed in the methodological overview, in order to reflect if this approach can be considered effective and scalable to different areas of intervention. They were collected and analysed and categorized according to four macro-categories corresponding to different scales of intervention (material hybridisation, production processes, gestures and rituals combination, merging of preparation methods) Fig. 4.

Some of these analysed case studies will be discussed below to evaluate their effectiveness and the type of design operation implemented Fig. 5.

The first project is *Mest*, a Turkish coffee service that sees an explicit conceptual material hybridisation between ceramic and copper, belonging to two different material cultures of coffee preparation - one more Middle Eastern/North African and one more European.

The *ibrik*, the chiselling of the cups (*zarf*), and all the accessories associated with the service and the typical preparation of Turkish coffee are usually produced in copper and brass, materials that are widely used due to the great experience of Anatolian artisans in the handcrafted production of tableware.

On the contrary, it is quite unusual in European countries to see these materials used in coffee preparation, where instead ceramics are widely used: a clear example is the coffee cup (demitasse), produced in this material almost throughout Europe.

Also from a value perspective, the project focuses on the common rituals associated with coffee consumption in Middle Eastern/North African and European countries, traditionally connected with meanings of sharing and hospitality (Oğut, 2009). Moreover, the material culture associated with coffee and the variety of experiences created around it establish strong and lasting bonds between users, both on a rational and emotional level (Chapman, 2005), generating a sense of belonging and continuity between the individual and the group, as well as between present and past (Ozge, 2012).

Another project is Me - dinner set, a versatile set of mobile kitchen equipment for food preparation and transportation during picnics, resulting from a collaborative exchange programme between international designers, the MTic-design⁸.

The concept is based on the identification of a common leisure activity (the picnic) between the Dutch and Colombian cultures.

Indeed in Colombia, the picnic is associated with a tradition, particularly prevalent in rural areas, called the "Pot Gathering" ("Paseo del holla"). This popular ritual encourages Colombian families to gather by the local river and share the traditional Colombian dish: sancocho, which is usually prepared on-site, as are many of the dishes consumed during this event.

Differently in the Netherlands, picnics, which are very popular as soon as summer arrives, are mainly practised inside city parks – often in conjunction with certain festivals: cooking with an open flame is not always allowed in these public places, except in special barbecue areas. The Me project brings together these different rituals and ways of preparing picnics – the Colombian way of bringing



Methods of preparation

Fig. 4



Fig. 5

Fig. 4 Collection and categorization of the various case studies analysed. Credits: authors.

Fig. 5 Selected case studies: Mest (Elsi Alovi, 2005), ME-dinner set (Emma van Eijkeren, Moak Studio, 2017), Grand Commis de Cuisine (Daniela Ciampoli, Marco Marseglia, 2018). Credits: authors. food to cook and the Dutch way of bringing everything ready-made – and creates a set in which it is possible both to have a small grill in a small, controlled space, and to bring along food that has already been prepared beforehand.

Another case study is *Grand Commis de Cuisine*, a couscous-pot born as part of an Italy-Morocco cooperation project, aimed at enhancing the craftsmanship of the two countries (Ciampoli & Marseglia, 2018). Couscous is a particular dish, widely consumed in both cultures and with strong material and symbolic value of aggregation, sharing and a sense of community.

From the analysis of the traditional way of preparing Moroccan couscous, by steaming and not by direct absorption of water, a design phase began aimed at the formal and functional identification of an object suitable both for this preparation and for the most common ways of serving at the table. The couscous pot designed is composed of three elements: a basic pot in which to cook meat or fish and vegetables, a bowl in which to steam the couscous, perforated at the bottom to allow the steam to rise and flavour it, and a lid functioning as a serving dish.

The strength of this project, however, lies in the designers' attempt to create a blend of production processes and materials from the two countries. The production phase was entrusted to an Italian ceramics craftsman, Alfredo Quaranta, who, guided by Italian and Moroccan designers, experimented with a hybridisation of decorative and formal devices from the two cultures.

Conclusions

In conclusion, the extensive literature linked to culture-driven design and the examples reported here show how the realm of food represents one of those particularly effective areas for the construction of an intercultural parrative.

In general, however, following the analysis of the case studies, it emerges that product design experimentations within this theme are still in their nascent stage and that there is certainly still a long way to go to achieve design maturity.

The examples proposed present obvious limits in terms of the depth of the design action. The experiments are presented as more *cross-cultural* than *intercultural*: hybridisation occurs mainly through the "juxtaposition" of elements (material or process) from territories with different cultural backgrounds rather than proposing true and coherent design reworkings. They appear more as speculative design operations: with their intrinsic value in terms of critical analysis and initiation of research reflections, but which at the same time do not necessarily respond to real territorial and social needs.

This paper aims to provide a first methodological approach to be applied in the field of intercultural design, paving the way for reflections on the possible design actions on this peculiar topic: experimenting, for example, new ways of preparing food, new ritual, new participatory actions of culinary hybridisation, new strategies of cultural dissemination, new utensils, etc.

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It is intended that the methodology proposed in this paper – which is under development with a view to being verified, tested and refined – also has an educational potential in the perspective of defining a new figure of *intercultural-mediator designer*.

Certainly, the practice of learning, improving, and applying this methodology also needs to evolve and develop in response to the changing of cultural and global trends. (Lee & Bain, 2016)

References

Bruns, M., Tomico Plasencia, O., Kint, J. M. L. (2012). Applying intercultural markers obtained from cooking in the design process. In Zampollo F., Smith C. (Eds.). Proceedings of the 1st International Conference on Designing Food and Designing for Food (pp. 140-155).

Chapman, J. (2005). Emotionally Durable Design: Objects, Experiences and Empathy. Routledge.

De Mendeiros, W. G. (2014). Meaningful Interaction with Products. *Design Issues*, 30, (3), 16-28. https://doi.org/10.1162/ DESI a 00275

Diehl, J. C. (2006). Globalization and cross-cultural product design. In Proceedings DESIGN 2006, the 9th International Design Conference, 503–509.

Bustamante Duarte, A. M., Ataei, M., Degbelo, A., Brendel, N., Kray, C. (2021). Safe spaces in participatory design with young forced migrants. *CoDesign*, *17*, *(2)*, 188 – 210. https://doi.org/10.1080/15710882.2019.1654523.

Dovigo, F. (edited by) (2005). La qualità plurale. Sguardi transdisciplinari sulla ricerca qualitativa [Plural quality. Transdisciplinary perspectives in qualitative research]. FrancoAngeli.

Hofstede, G. (1984). Culture's Consequences: International Differences in Work-Related Values. SAGE Publications.

Lee, D. Y., Bain J. (2016). Developing a Cross-Cultural Design Methodology: A study of UK-South Korean Collaboration in Higher-Education Design. In *The global eLearning journal*, *5(2)*.

Lin, R. Sun, M.-X.; Chang, Y.-P.; Chan, Y.-C.; Hsieh, Y.-C.; Huang, Y.-C. (2007). Designing "Culture" into Modern Product - A Case study of Cultural Product Design. In Proceedings of the Usability and Internationalization HCI and Culture (388-397).

Lipton, R. (2002). Designing Across Cultures: How to Create Effective Graphics for Diverse Ethnic Groups. HOW Design Books.

McMullen, M. (2016). Intercultural Design Competence: A Guide for Graphic Designers Working Across Cultural Boundaries. In *The International Journal of Visual Design*, 10(3), 19-30. Meyer, E. (2014). *The Culture map.* Hachette Book Group.

Moalosi, R., Popovic, V. (2006). Culture-driven product innovation. *In Proceedings DESIGN 2006, the 9th International Design Conference* (573–578).

Muratovsky, G. (2016). Research for designers. A guide to methods and practice. SAGE Publications.

NEMO. (2016). Museums, migration and cultural diversity: Recommendations for museum work. Network of European Museum Organisations, Berlin.

Oğut, Ş. T. (2009). Material Culture of Tea in Turkey: Transformations of Design through Tradition, Modernity and Identity. In The Design Journal, 12(3), 339-363.

Ozge, M. C. (2012). Tradition and innovation: A study on reconfiguration of product language through innovative approaches. In L.-L. Chen, T. Djajadiningrat, L. Feijs, S. Fraser, S. Kyffin, & D. Steffen (Eds.), Design and semantics of form and movement. DeSForM 2012: Meaning, Matter, Making (150-159).

Radtke, S. (2021). *Intercultural Design Basics*. BIS Publishers.

Tarchi, D., Sermi, F., Kalantaryan, S., Mcmahon, S., Kaslama, P., Alvarez Alvarez, M., Belmonte, M. (2021). Atlas of Migration – 2021. Publications Office of the European Union.

Ting-Toomey, S. (1999). Communicating Across Cultures. New York: The Guilford Press.

Tosi, F., Lotti, G., Follesa, S., Rinaldi, A. (Eds.). (2015). Artigianato Design Innovazione. Le nuove prospettive del saper fare [Craftsmanship Design Innovation. The new perspectives of savoir-faire]. DIDApress.

UNESCO (2009). Investing in Cultural Diversity and Intercultural Dialogue. UNESCO Publishing.

United Nations High Commissioner for Refugees (2022). Global trends. Forced displacement in 2021. UNHCR Statistics and Demographics Section. The 8th International Forum of Design as a Process, themed "Disrupting Geographies in the Design World" was held in Bologna from 20 to 22 June 2022. The event was organised by the Advanced Design Unit of the Alma Mater Studiorum – Università di Bologna, Department of Architecture, in collaboration with two partner universities: Tecnológico de Monterrey (TEC) and Pontificia Universidad Católica de Chile.

The Forum engaged speakers from the Global Design community, expanding the original vocation of the Latin Network for the Development of Design as a Process to include researchers and designers of the Mediterranean Area, Middle East, IOR (Indian Ocean Region), and Global South regions. The goal was to share new perspectives on imagining design futures in a responsible and just perspective, at the forefront of change, while building strategic partnerships and creating accessible knowledge.

Structured around three pillars — seminars, workshops, and exhibitions — the Forum hosted meetings, reflection opportunities, networking activities. It involved designers, scholars, young researchers, design entrepreneurs, in an experimental format.

Speakers' contributions not only inspired the practices of the designers' community, but also resonated with students and the broad audiences. The presentations explored intersections of materiality and culture, post-coloniality, decoloniality, gender studies, and other areas of human thought and action which seek to analyse, question and challenge the disruptive geographies in the world, today.

The papers submitted to the five tracks proposed are published in the Digital Special Issue 1 of *diid.* disegno industriale – industrial design, celebrating during those days its 20th anniversary and serving as the fourth partner of the event.

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