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**Citation:** Mora, Simone, Divitini, Monica, Kurze, Albrecht, Berger, Arne, Mazzarello, Martina et al. 2022. "Virtual and in-person co-design workshops: from alternative to complementary approaches.."

**As Published:** <https://doi.org/10.1145/3527927.3531209>

**Publisher:** ACM|Creativity and Cognition

**Persistent URL:** <https://hdl.handle.net/1721.1/146406>

**Version:** Final published version: final published article, as it appeared in a journal, conference proceedings, or other formally published context

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# Virtual and in-person co-design workshops: from alternative to complementary approaches.

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## ABSTRACT

Co-design methods and toolkits are commonly used to involve people from diverse backgrounds and disciplines in design processes, promoting collaboration, design thinking, shared decision making, and creativity. These methods and toolkits are generally tailored to in-person workshops supported by different physical artifacts (e.g. card-sets) in a shared physical location. Physical co-location and artifacts allow participants to interact in seamless ways, relying on everyday modalities of interaction. The CoViD-19 pandemic has forced many of such workshops online. This required transforming location, methods, toolkits and to rethink interaction among participants. With this workshop we aim to look back at these experiences of transformation and to reflect on the affordances of the physical and the virtual in co-design workshops. What are the challenges of transforming location, methods, and toolkits that are designed for in-person workshops into the digital? In which ways can in-person and virtual workshops co-exist and complement each other? We invite participants to share their experiences and reflect on how to bring together virtual and in-person co-design workshops.

## CCS CONCEPTS

• **Human-centered computing** → **Participatory design**;

## KEYWORDS

Co-design workshops, toolkits, in-person workshops, virtual workshops

### ACM Reference Format:

Simone Mora, Monica Divitini, Albrecht Kurze, Arne Berger, Martina Mazzarello, and Dries De Roeck. 2022. Virtual and in-person co-design workshops: from alternative to complementary approaches.. In *Creativity and*

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C&C '22, June 20–23, 2022, Venice, Italy  
© 2022 Copyright held by the owner/author(s).  
ACM ISBN 978-1-4503-9327-0/22/06.  
<https://doi.org/10.1145/3527927.3531209>

*Cognition (C&C '22)*, June 20–23, 2022, Venice, Italy. ACM, New York, NY, USA, 4 pages. <https://doi.org/10.1145/3527927.3531209>

## 1 FOCUS OF THE WORKSHOP AND RELEVANT TOPICS

Co-design (or participatory design) originated in the mid-1970's in Scandinavia as a research field aiming to develop tools and methods to facilitate the development of digital tools in the workplace that meet workers' needs and interests. Since then it has also developed outside the workplace, e.g. in architecture and urban planning, for the design of public space. The field has at its core the democratization of the design practice, once only accessible to experts [7]. Participatory design strives to turn people from informants of the design process to designers themselves [13], thanks to the use of researcher-created methods, tools and toolkits. With the term *participatory* we assume that all relevant stakeholders (policy makers, citizens, urban planners, scientists, etc.) should be enabled to voice their opinion throughout all the design phases of a project; changing the design practice from being a clearly defined, linear sequence of tasks to an iterative process of reflection-in-action [4]. Participation encompasses all the different stages of the design process: from the analysis of requirements, to ideation, prototyping and technology adoption.

A number of co-design methods have been proposed by design researchers; e.g. to facilitate the design of Internet of Things (IoT) applications and services [2][11], serious games [12][9]; and to allow participants to collaboratively address privacy and ethical issues related to technology adoption [10]. For a review see [1]. These methods and supporting toolkits are useful to involve people from diverse backgrounds and disciplines in the design process. They operate enhancing participants' skills such as collaboration, creativity and reflective thinking, often relying on gamification (e.g. design games) and contest theory (e.g. hackathons) to increase engagement.

Co-design usually happens in the context of workshops where participants are co-located, facilitating interaction among the participants, the toolkit artifacts and workshop facilitators. Restrictions due to the CoViD pandemic led to an increased interest for digital tools to promote co-design in virtual settings, among distributed participants. A number of physical toolkits have been transformed

into digital counterparts, to be used in virtual conferencing environments. These transformations have often been intended as emergency solutions, whenever meeting in-person was not possible, and developed with limited availability of time and resources. These led, in many cases, to physical toolkits (e.g. card-based, post-its based, etc.) that are simply mirrored into a digital version without taking full advantage of the new affordances. Despite this, initial experiences are encouraging. For example, an explorative digital transformation of Tiles, and IoT ideation toolkit, led to promising results in terms of participants' engagement and creativity, but with some concerns in terms of cooperation [14].

The process of translating physical tools to the digital domain poses several trade-offs. For example, brainstorming cards offer very intuitive affordances, allowing for linear (e.g. as a stack) or concurrent (e.g. laid out) use; they can be shared on a table or kept private on hand. The tangible manipulation of physical artifacts in workshops is linked to better creativity outcomes [6]. Yet, physical cards need to be produced, with associated costs and limiting how much one might iterate and adapt them for different purposes. Virtual cards on the other hand can be modified swiftly and are ready to use; allowing for fast adaptation and replication. In a similar way, virtual canvases and whiteboards offer unlimited space and granularity (zooming out or in), contents are always oriented correctly to the viewer can be easily tracked and stored. However the use of virtual canvases (e.g. online tools such as Miro and Murals) usually need some introduction and might come with usability issues of their own. Participants in a boundless virtual space might be more prone to get lost in possibilities, losing shared focus and overview. In short, there are good arguments for both physical and virtual strategies. We aim at capitalizing on these experiences and promoting a reflection on the affordances of the physical and the digital and their co-existence. Our goal is to develop a better understanding of how to design better hybrid co-design experiences bringing together the best of both worlds.

This special session aims at sharing experiences and challenges designing and facilitating co-design workshops for multiple domains. We aim at understanding how the diverse affordances available in the physical and digital realms impact on the ability of co-design tools and methods to foster participants' creativity, collaborations and learning skills; as well as overall design outcomes. We are interested in the process adopted by researchers to fully digitalize existing physical toolkits as well as hybrid approaches.

This leads to questions we are interested in (non exhaustive) and where we expect to give some examples based on our experience and to get some answers based on workshop participants' experience.

- What are the strengths of a physical materiality of co-design tools, e.g. ideation cards, playing tokens or interactive probes with sensors and actuators?
- How can analog/physical tools be transferred into the digital space, to make them also usable for virtual workshops?
- What can not be transferred (easily)?
- Where do digital tools (in virtual space) per se have a given advantage so that they are to be preferred / integrated even in a co-located onsite workshop?

- How does the virtual space influence the interaction between participants, e.g. virtual breakout rooms vs. different tables or corners in a real workshop room?
- How do workshop facilitators need to adapt to virtual and hybrid settings?

During the workshop, we will briefly demonstrate four co-design toolkits as a way to have concrete examples to engage participants with a critical discussion on different hybrid strategies. The toolkits were created by the workshop organizers to support in-person workshops and later considered or adapted to virtual workshops. The *Idiosyncratic Ideation Toolkit* [8][3] offers a playful way to explore the basic principles, design concepts and scenarios for IoT devices and services. It is a combination of Loaded Dice, a pair of dice with embedded sensors and actuators, used in conjunction with different card sets and a canvas to develop design scenarios and to ideate idiosyncratic smart home objects and services. The *IoT Design Kit* [5] is a set of design and strategy tools that enable a playful way of exploring novel directions, interactions, and scenarios for smart objects. The toolkit provides a set of elements that can be completed as individual exercises and from different starting points and user journeys in workshops. The *Tiles Inventor Toolkit* [11] ([www.tilestoolkit.io](http://www.tilestoolkit.io)) supports non-experts to invent IoT solutions to tackle the UN Sustainable Development Goals. It is composed of a set of ideation cards, a brainstorming canvas and a playbook to be used in short (30-60 minutes) ideation workshops. The workshops require little supervision and can also be used as educational experiences for basic concepts in IoT and design thinking skills. The *Data Monopoly* is a multi-player board game that leverages mechanics borrowed from the monopoly playbook to foster critical thinking on ethical values related to the collection, processing, and sharing of personal data through different tracking opportunities around us. In the game, players with the role of citizens collect some datasets or sensors, negotiate their value with the city, trade sensors/datasets with their opponents, with the goal being to drive them into bankruptcy or having a greater asset of sensing opportunities.

We encourage participants to submit a statement of interest (one page) with a summary of their experience in the field and topics they would like to discuss during the workshop. We also encourage young researchers with little experience to participate. Topics of interest include, but are not limited to:

- Physical, digital and hybrid co-design workshop methods and toolkits
- Evaluation of co-design methods and tools
- Experience facilitating co-design workshops in formal and informal settings
- The use of co-design workshops in education

Research statements shall be submitted via email to [*submission-email to be defined*].

## 2 RELEVANCE AND SIGNIFICANCE OF THIS TOPIC TO THE COMMUNITY

Promoting creativity is one of the core goals of the co-design methods addressed in the proposed workshop. Cards, supporting artifacts, and semi-structured processes are designed with the aim

of promoting creativity and supporting participants with different backgrounds in ideating and developing ideas. Adapting these methods for a virtual context brings along different challenges, but also the potential for richer creative experiences. The workshop topic and its outcomes have relevance to how the community will run co-design activities in the future. Especially when it comes to thinking about the time of CoViD, it is right now time to reflect what was learned until now, useful also for future (non) pandemic times. In this perspective, the proposed workshop targets core themes of the conference.

### 3 DELIVERABLES AND OUTCOMES

The workshop will contribute to increased knowledge to promote creativity and innovative co-design hybrid processes. We aim at compiling a list of strengths and trade-offs of physical and digital tools, and define best practices for the adaptation of physical tools to virtual environments and how to benefit from the possibilities of both modalities in hybrid workshop settings. We also plan to define guidelines for design researchers and professionals to facilitate workshops in virtual and hybrid settings. We aim to define a roadmap that can be used by researchers for future research and cooperation.

### 4 TENTATIVE SCHEDULE

**The workshop is planned as a full day event.**

The workshop will combine short plenary presentations to share experiences, especially with conducting workshops throughout the pandemic; group-based hands-on activities to try out a number of co-design toolkits and build a shared understanding of strengths and challenges of in-person and virtual workshops; and plenary reflection sessions to consolidate the results of the day. The workshop will be designed to be highly interactive and inclusive. Activities will be fine-tuned based on the selected participants, considering their background, interest, and competencies. The workshop organizers have extensive experience in designing engaging workshops bringing together researchers, students, and practitioners.

#### Schedule

Morning 10.00 – 12.00

- Welcome and introduction from the workshop hosts
- Workshop participants introduce themselves and their research interests
- Brief overview on co-design methods and toolkits
- Brief presentation of the co-design toolkits available for the participants to play with

Midday 12.30 – 14.00

- Small groups use one of the co-design methods and toolkits. Workshop hosts will facilitate the sessions.
- Second round for each group with a different co-design method or toolkit.

Afternoon 14.30 – 16.00

- Critical reflection of underlying assumptions, values, and goals
- Definition of a research agenda and future venues for collaboration

- Final comments and remarks from the workshop hosts

### 5 ANTICIPATED AUDIENCE AND DISSEMINATION

The workshop aims to foster a creative dialogue between researchers and practitioners interested in co-design methods, as well as in the organization and facilitation of workshops. In this perspective, we target the co-design community, especially those among technologists, educators, psychologists and sociologists interested in innovative co-designed solutions such as smart and networked products, responsive environments, urban technologies and user experiences. In addition, we expect the workshop to be of interest for new participants among city planners, policy makers and entrepreneurs involved in the design and development of smart living environments and sustainable development.

A workshop website will be made available if the workshop is accepted. The Call for Participation will be disseminated through relevant mailing lists, social media and directly to actors potentially interested. Participants will be selected based on a short statement of interest (one page) with a summary of their experience in the field and topics they would like to discuss during the workshop. Assuring diversity of participants will be in focus to assure a workshop with multiple voices.

### 6 ORGANIZERS

With a background in creating and using co-design tools in the domain of smart connected products and service for the Internet of Things (IoT), all the workshop organizers have gained extensive experience with the design and facilitation of co-design workshops.

**Simone Mora:** I am a research scientist at Senseable City Lab, Massachusetts Institute of Technology. I hold a PhD degree from the Norwegian University of Science and Technology. I'm interested in technology that blends bits and atoms and its impact on societies; I research methods for co-design and co-prototyping of future sustainable cities. I lead SCL's City Scanner research initiative, a platform for mobile and low-cost environmental sensing. In 2018 I co-founded a startup company that develops educational toolkits.

**Monica Divitini:** I am professor of Cooperation Technology at the Department of Information and Computer Science, NTNU, Trondheim, Norway. I hold a PhD in Computer Science from Aalborg University, Denmark. My research interests lie primarily in the area of cooperation technology and technology enhanced learning, with focus on mobile and ubiquitous technology. I am the coordinator of the TESEO Lab initiative (<http://research.idi.ntnu.no/teseo/>), focusing on issues related to technology for supporting cooperation, social interaction, and learning. I have extensive experience with the use of Tiles in educational settings, in higher and secondary education.

**Albrecht Kurze:** I am a Postdoc at the chair Media Informatics at Chemnitz University of Technology, Germany. My research interests are on the intersection of Ubiquitous HCI and human centered IoT. I have a soft spot for tools and methods in the process of designing and developing technology. I organized the international IoT ideation expert workshop in Chemnitz in 2018 and facilitated a number of IoT workshops with different partners. I co-created the Loaded Dice and lastly an electronic version of the Tiles toolkit, for

a remote workshop. I co-authored some of the mentioned papers on co-design methods for the IoT, including comparing them.

**Arne Berger:** I am a Professor of Human-Computer Interaction at HS Anhalt (the second incarnation of the Bauhaus). Currently, I am particularly interested in the design space of smart connected things and services in the context of the home. With my work I strive to support people in imagining alternative futures, to explore these futures and to critically reflect upon them. I lived on three continents and did design research field work in North America, Europe, Australia, and Asia.

**Martina Mazzarello:** I am a PostDoc researcher at Senseable City Lab, Massachusetts Institute of Technology. My background is in Spatial and Service Design, with a main focus in the relationship between physical, digital and human interaction layers of spaces. As a creative strategy researcher my method aims at ensuring that the user is put at the center of the analysis and design process, making products or services usable, viable and desirable. I'm always looking for opportunities to design research tools and methods to apply my main focus in innovative research projects aiming at urban spaces and services as dynamic systems of human actions and interactions.

**Dries de Roeck:** I have a background in industrial design and have been switching between the academic research and design practitioner hats ever since. I am a designer and researcher, with a strong interest in how technology impacts the day to day life of people. I hold a joint PhD degree in Social Sciences (K.U.Leuven) and Product Development (UAntwerpen) where I am also wrapping up my PhD research. I am a board-member of ThingsCon, a leading community of IoT practitioners in Europe. I co-organise the family friendly hackercamp Fri3d Camp, organize technology related activities for primary schools, and I am one of the creators of The IoT Design Kit.

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