# Infrastructure and Creativity: Can they co-exist?

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**Abstract.** With this workshop, we aim to provide a forum for participants populated by researchers, artists, and practitioners to share their experiences with creativity in infrastructures and infrastructures in creativity. The goal is to learn from different approaches and perspectives. We focus on reflecting on key issues based on CSCW (Computer Supported Cooperative Work), PD (Participatory Design), and IxD (Interaction Design) concepts and approaches regarding facilitating creativity. It should act as a seed for further exchange of ideas and cross-community fertilization. After briefly introducing state-of-the-art creativity and infrastructures, different approaches connected with supporting practices of being creative in given infrastructures and re/shaping infrastructures to facilitate creativity in processes will be examined and evaluated in group discussions by informing the presented practices with theories and concepts from CSCW, PD, IxD and creativity research.

# Proposal

Problem-solving and solution-finding are intrinsically linked to creativity. Creativity is defined as the ability or power to create, and links back to the Latin word creare "to make, produce, [...]" (*creative | Etymology of creative by etymonline*, no date). Creativity encompasses a wide range of activities, from artistic expression to problem-solving in various domains, and it plays a pivotal role in human innovation and progress (Tellioglu, 2023).

In this workshop, we want to investigate issues at the intersection between infrastructures and creativity. This is an area that has received little attention in the E/CSCW community, but it is critical for example, in the context of digitalization processes and design for sustainability.

Infrastructures are the backbone of human activities and include buildings, roads, energy, communication networks, and institutions among others. As Lee and Schmidt (2018) point out, the term infrastructure has been explored widely in the literature surrounding CSCW, Information Systems and Science and Technology studies, and does not fit one universal definition. We welcome various interpretations and conceptualizations of the term infrastructure. Further, we broadly define infrastructure according to Bowker et al. (2010) as "pervasive enabling resources in network form". These resources can include social, organizational, and technical or material components. In CSCW, the concept of infrastructure is often used to understand and analyze information systems in the context they are applied to.

Information systems are believed to be a special type of infrastructure that needs to support work-oriented infrastructures (Pipek and Wulf, 2009). They have a unique versatility, meaning they can be used for many different purposes in many work environments, and are reflexive, i.e., IS designers and users are part of the same infrastructure as well as that improvements to the infrastructure are developed from within it. Hanseth and Lundberg (2001) use the example of implementing information systems in healthcare, to point out that the users hold expert knowledge about this infrastructure and should therefore be the primary designers of the system. Users will further add to the existing infrastructure by improving or replacing any of its components.

This highlights the importance of users in the design and development and design in-use of infrastructures. The efforts related to pre-infrastructure activities (e.g., design and development) and design activities in-use (e.g., adaptation, tailoring, re-design, maintenance) are often referred to as infrastructuring (Pipek and Wulf, 2009).

Debates about creativity and design processes encompass a wide range of topics, reflecting the evolving nature of design and its impact on society, technology, and culture, like ethical design and responsibility (Arista *et al.*, 2021), inclusive and accessible design (Henry, 2021), sustainable and eco-friendly

design (Lofthouse, 2016), AI and automated design (Shneiderman, 2016), etc. But also, speculative design as a creative and forward-looking approach to design that explores and provokes questions about possible futures, often challenging existing assumptions and norms (Dunne and Raby, 2013). For this workshop, it is crucial to consider creativity as something that is required to make the system work (e.g., routine work processes but also workarounds) and creativity as something that is wanted as an outcome of a process (e.g., in design processes to maintain innovation in a work environment).

Current societal challenges – climate change, aging populations, inclusive education – require creative solutions. However, the infrastructures that permeate every aspect of work and life are often difficult to change. An infrastructure developed over years and decades becomes hard to change as it gets older. An old IT platform will make it impossible to transform an organization digitally with new and better solutions. Even for new infrastructures, their complexity might make it difficult to conceive creative adaptation.

In a healthcare context, the infrastructure consists of a range of systems, health professionals, institutions, and established practices (Ellingsen, Hertzum and Melby, 2022). Many healthcare organizations therefore struggle to adopt and integrate IS, in particular generic systems. Such projects are often associated with a misfit between the existing infrastructure and the new system. Which in many cases results in creative solutions like workarounds or shadow systems to overcome daily tasks (Ringdal and Farshchian, 2023). This raises the question of whether such creative solutions can improve the digital infrastructure and how they are dealt with.

To summarize, infrastructures require creativity from the people working within them to address challenges and problems that are not facilitated by the infrastructure, and infrastructures require creativity as part of their design process. Many approaches have been proposed, especially in Interaction Design, to promote co-design of creative solutions through, e.g., design thinking, brainstorming, and other creative processes. But often, the proposed solutions are not feasible because they do not consider the constraints and opportunities given by existing infrastructures.

## Workshop Goals

In this workshop, we aim to bring together people working with creativity in infrastructures and infrastructures in creativity. The goal is to learn from different approaches and perspectives. We aim to provide a forum for participants, populated by researchers and practitioners with different perspectives to share their experiences with processes connected to creativity in existing infrastructures or by considering the creativity aspects of the practices supported by them. It

should act as a seed for further exchange of ideas and cross-community fertilization.

We focus on reflecting on key issues based on CSCW (Computer Supported Cooperative Work), PD (Participatory Design) and IxD (Interaction Design) concepts and approaches regarding engagement, participation, and consensus-making in (technology-supported) co-creation processes. To this aim, we are looking for contributions that:

- Survey relevant developments in the area and thus contribute to the understanding of the identified challenges from multiple perspectives.
- Describe original empirical or theoretical work that sheds light on the workshop topic.
- Discuss similarities and differences in theoretical and methodological approaches in infrastructure and in creativity research.

We welcome participants willing to share their:

- Experiences of meeting a rigid infrastructure not susceptible to creative solutions.
- Investigations on digital infrastructures, change, and innovation.
- Success or failure stories of how to creatively transform an infrastructure.
- Case studies and best practices for cross-disciplinary (co-)design of creative solutions.
- Approaches to work creatively with infrastructures.
- Best practices to integrate into creative processes the opportunities and constraints set by existing infrastructures.
- Theoretical constructs to understand the relationship between infrastructure and creativity.

Three additional aims supplement this primary goal. By bringing the workshop participants together, we hope that cross-fertilization will ensue among their cases, concepts, and questions. Second, we will collaboratively reflect on what CSCW, PD, and IxD contribute to the study of co-creation practices in creativity and infrastructuring processes, by applying Design Thinking methodologies and how we, as individuals and a community, can facilitate the transfer of these contributions to practitioners. Third, we will discuss the interest in further collaboration and networking initiatives regarding the further development and implementation of creativity and infrastructuring frameworks and methodologies.

# Activities

The workshop is structured as a full-day event. It will consist of diverse activities, with an emphasis on in-depth conversations and community building:

1. Introduction. The organizers opened the workshop by introducing the agenda and goals for the day. They then facilitate a round of meet-and-greet activities, giving each participant a moment to introduce themselves and their interest in the topic by using ice-breaking activities.
2. Panel discussions. The participants will be organized into thematic panels based on their position papers. Everyone will give a 6-minute presentation, followed by a collective discussion. The organizers will take shared notes to generate material to be worked on collaboratively.
3. Break-Out Groups. Participants will split into groups of 3-4 people to further explore shared interests through discussions to refine relevant themes and identify common challenges at the theoretical and methodological levels. For this activity, groups will be encouraged to focus their conversation on methodological issues. The goal is to identify key ideas and questions for discussion.
4. Summarizing. In this session, participants will be given a moment to review the collective notes taken during the day and to note down key insights and reflections. We will then go around the room to listen and respond to each other's thoughts.
5. Next Steps and Closing. The workshop will conclude with a shorter discussion around possible next steps to advance CSCW, PD, and IxD research around the challenges in processes of creativity and infrastructuring and to consider opportunities for further collaboration.

The organizers will proactively ensure that the workshop is an interactive event with clear outcomes.

# Participants

The workshop can accommodate a maximum of 20 participants (including the organizers). This would ensure a highly interactive event with time for discussion and the sharing of multiple perspectives. Participants will be recruited from the CSCW, CHI, PD, IxD and artist communities. In addition to the general dissemination provided by ECSCW2024, the organizers will reach out to these communities through their extended research networks and by circulating a call for participation on relevant mailing lists, such as EUSSET, CSCW, CHI, and

through social media. Detailed information about the workshop will be made available on our workshop website.

Participation in the workshop requires the submission of a position paper. We encourage potential participants to explain their interest in the workshop and particularly welcome position papers that address one (or more) of the workshop themes outlined above. We encourage all participants to state their positions and list 2-3 questions they want to discuss in the workshop at the end of the position paper. Position papers are limited to two pages (excluding references) in the ECSCW paper format, available in Latex (Overleaf template), RTF, or MS Word format. The position paper shall be submitted in PDF format to [michaela.schmidt@ntnu.no](mailto:michaela.schmidt@ntnu.no).

The submitted position papers will be reviewed by the organizers and accepted based on the relevance and development of their content. Suppose the number of people interested in attending the workshop exceeds its capacity. In that case, the organizers will prioritize submissions for rich presentations and discussions while seeking diversity among the participants. We expressly encourage both junior and senior researchers to submit position papers. To promote broader participation, particularly from artists and practitioners, we also offer the option of submitting alternative material of rough equivalence to a position paper (e.g., an experience report, an illustrating artifact, or an abridged implementation plan). The workshop is intended to bring together participants for a full day.

# Organizers

The workshop is organized by several senior and junior researchers who have investigated creativity and infrastructuring activities or co-creation and participation methodologies and technologies for decades and are currently involved in research projects about the realization of several aspects of these areas.

**Michaela Schmidt** is a PhD student at the Department of Computer Science at the Norwegian University of Science and Technology (NTNU). Her research focuses on digitalization at the organizational frontline of public sector organizations.

**Monica Divitini** is a professor of Cooperation Technologies at the Norwegian University of Science and Technology (NTNU). Her research interests lie primarily in co-design and learning technologies. She has consolidated experience with the collaborative organization of international workshops. She was co-chair for the journal track of ECSCW2023.

**Christine Hohenbüchler** is a professor of Drawing and Visual Languages at the Faculty of Architecture at the TU Wien Institute of Art and Design and leads the Institute. The artistic practice and research are teamwork with her sister Irene Hohenbüchler. The focus is on social issues, (art in) public spaces, participatory work, and the idea of "multiple authorship" plays a central role.

**Nora Ringdal** is a PhD student at the Department of Computer Science at the Norwegian University of Science and Technology (NTNU). Her research focuses on socio-technical approaches to implementing information systems in the public sector, within healthcare.

**Theresa Schütz** is a PhD student at the Department of Architecture and Spatial Planning at the TU Wien at the Faculty of Art and Design, and she is part of the Doctoral College STE[A+]M. Her doctoral research focuses on how art-based common design practices create knowledge production with the aim of fostering transversal learning through arts in STEM education.

**Hilda Tellioglu** is an associate professor and head of Artifact- based Computing & User Research (ACUR) Unit at the TU Wien at the Faculty of Informatics, chair-elect of EUSSET, and scientific director of the Center for Technology and Society of the TU Wien. Her research focus covers the design and development of artifacts and their involvement in different settings, like homes, work, or public spaces, design thinking, co-design, user-centered design, and evaluation.

## Additional Equipment

The workshop only requires standard equipment. In addition to a room with Wi-Fi and a projector, we will merely need flipchart-size paper, markers, pens, and Post-it notes.

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