

# The Futures of Hybrid Work: A Socio-Technical Framework for Designing Hybrid Environments

Melanie Duckert

mela@itu.dk

IT University of Copenhagen  
Copenhagen, Denmark

## ABSTRACT

Collaboration across distances is a core interest in CSCW. During the COVID-19 pandemic, most people were forced to work from home, and this long-term change in work conditions revealed both opportunities and challenges that continue to affect the post-pandemic future. While we do not know in which specific ways, we are certain that it will combine analog and digital work practices. Hybrid work consists of both collocated and distributed people whose collaboration is enabled by physical as well as digital artefacts. This PhD research aim to comprehend cooperative engagements across the spectrum of fully collocated and completely virtual, focusing the placement of hybrid work. We study how hybrid work can be conceptualized within the research field of CSCW. This conceptual grounding is vital for understanding the extent and implications of hybrid work in designing technologies to support future work practices

## CCS CONCEPTS

• **Human-centered computing** → **Empirical studies in collaborative and social computing**; **Computer supported cooperative work**.

## KEYWORDS

Cooperative work, Distributed work, Hybrid work, Future work

### ACM Reference Format:

Melanie Duckert. 2023. The Futures of Hybrid Work: A Socio-Technical Framework for Designing Hybrid Environments. In *Computer Supported Cooperative Work and Social Computing (CSCW '23 Companion)*, October 14–18, 2023, Minneapolis, MN, USA. ACM, New York, NY, USA, 3 pages. <https://doi.org/10.1145/3584931.3608921>

## 1 INTRODUCTION

During the COVID-19 pandemic, social distancing was used as a preventive strategy for infection. This led to geographical dispersal, becoming a condition for collaboration during the prolonged lockdown. The omnipresence of digital artifacts enabled continuous connectivity [7, 8], contributing to the swift digital transformation during this time [23]. Platforms like Teams and Zoom facilitated diverse communication and collaboration across distances [10].

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CSCW '23 Companion, October 14–18, 2023, Minneapolis, MN, USA

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ACM ISBN 979-8-4007-0129-0/23/10.

<https://doi.org/10.1145/3584931.3608921>

The distributed conditions during the lockdown revealed both challenges and opportunities of remote work [34], which persisted even after the regulations were lifted. For example, it introduced more flexibility in everyday work-home practices [15], but the extensive use of online communication tools also led to Zoom fatigue [29]. The post-pandemic return was not a simple reversion to the pre-pandemic status quo, preferences shifted and companies faced challenges in retaining their employees [12, 33]. While there are different preferences for how *the future of work* will unfold, it is likely that remote opportunities will continue to be integrated into the post-pandemic world.

It is a core in CSCW to understand how to design digital technologies supporting groups in their collaborative work activities [17]. Cooperative work was by Schmidt and Bannon defined as at least two people who are mutually dependent in work, meaning that they are interdependent and should rely positively on each other's activities [31]. Cooperative systems are complex; They need to consider both the individual user and the challenges that arise in group processes, which will often put on more work on the individual person engaging in the cooperative activities [19, 31, 32]. Previous CSCW research has documented several challenges in cooperative work, for example, in creating common ground and a shared meaning context [11, 16, 18, 20, 31]. Collaborative work across distances has been an interest within CSCW for decades [28]. Collocated cooperative work refers to actors engaging in work where all actors are physically present at the same site, whereas distributed work refers to actors cooperating across geographical distances. When arrangements are distributed across different sites further complexities are added to the cooperative work such as cultural and temporal dimensions, as well as the geographical distance in itself [4, 5, 9, 22, 24, 35].

This PhD explores how to provide new insights across the collaboration spectrum, navigating the transition from remote to hybrid work. We facilitate an understanding of cooperative interactions that occur along the continuum between fully collocated and completely virtual settings, in which hybrid work is placed. Although hybrid work is not a new concept and has already been implemented in various contexts – such as the office [1, 3, 24], in healthcare settings [25, 26], in performance [2, 14], and at academic conferences [30], to name a few – previous research on cooperative work has not clearly distinguished between cases where all collaborating actors are dispersed and those where some actors are partly collocated. As remote participation becomes increasingly integrated into daily work practices, it becomes crucial to distinctly comprehend *hybrid work* and its relationship to the broader spectrum of cooperative work. The central question guiding the PhD research is: *How can we conceptualize hybrid work within the research field of CSCW?*

Establishing a conceptual grounding for hybrid work is essential to understand its scope and the implications it invites for designing technologies that support hybrid work practices. The objective is to identify opportunities and challenges within hybrid cooperative work, with a particular emphasis on enhancing digital technologies to effectively support work in hybrid environments. In the following, I present the methods applied to answer the research question, the preliminary findings, future work, and finally a discussion of how this contributes to the understanding of collaboration in the work of the future.

## 2 METHOD

To facilitate the conceptualization of hybrid work, we employ three data collection methods: literature analysis, ethnography, and surveys. This combination of approaches offers insights into historical instances of hybrid work, current work practices, and diverse perspectives on future work scenarios.

To comprehend how existing research literature portrays hybrid work, we conducted a theoretical examination of previously published papers that presented empirical insights into hybrid arrangements within the fields of computer-human interaction (CHI) and computer-supported cooperative work (CSCW). This process of identifying literature was iterative, guiding us to understand the unique attributes and progressively refine our definition of hybrid work. The investigation of these papers challenged our assumptions and preconceived notions about this form of work. Our aim was to identify papers that provided empirical insights into hybrid arrangements, enriching our conceptual framework. Given the focus on office environments in much of the research, it was imperative for us to identify cases that extended beyond the office setting. While the included papers often did not explicitly label their cases as "hybrid," we identified instances of collaborative work within hybrid settings. The detailed analysis of these cases illuminated the distinct characteristics inherent in hybrid arrangements. By scrutinizing the challenges and communication breakdowns that emerged, we gained insight into the complexities faced across various types of hybrid work environments.

To gain an understanding of how hybrid work unfolds in real-world scenarios, we conduct ethnographic research within three different companies. Immersing ourselves in the natural context of hybrid work practices allow us to uncover both the opportunities and challenges that emerge when individuals engage in hybrid arrangements. Ethnographic studies have played a pivotal role in CSCW, contributing essential concepts to the research field [6]. In our study, we focus on the collocated site to investigate elements such as awareness, articulation, relationship work, and boundaries in hybrid work arrangements. The empirical data collection phase takes place during the second year of the PhD program and is an ongoing endeavor.

Lastly, we plan to incorporate quantitative methods, drawing inspiration from previous CSCW studies that utilized surveys as their primary data collection tool (e.g., [10]). The specific execution of this phase will be determined following the completion of the empirical ethnographic research. Our hope is that the amalgamation of all three methods will provide a comprehensive dataset that

enables us to conceptualize hybrid work from both qualitative and quantitative angles.

## 3 PRELIMINARY AND FUTURE WORK

The first part of the PhD research has been published and presented at CHI 2023 [13]. In this study, we aimed to understand the characteristics of hybrid work and identify the distinct design challenges posed by digital technologies that support collaboration in hybrid environments. We introduced a conceptual definition of hybrid work to facilitate the identification of instances of hybrid work. Our findings indicated that hybrid work inherits challenges and aspects from both collocated cooperative work and distributed cooperative work, situating it as a subset within the realm of cooperative and distributed work. However, we also discovered that certain challenges increase in complexity in hybrid work due to the inherent constraints of hybrid settings. Hybrid environments, by default, involve unequal access to information and other actors. These environments inherently consist of sub-groups, some of which are collocated while others are distributed. Consequently, hybrid cooperative environments are characterized by misalignment and asymmetry. Furthermore, our analysis revealed a unique boundary that exists within hybrid work, which we refer to as *collocated distance*. We identified instances where actors who were physically collocated lacked a shared understanding, leading to breakdowns in establishing common ground. This occurred because distributed actors assumed that collocated actors shared the same information – which was not the case. As a result, we introduced the term *collocated distance* as a reminder not to overlook the potential misalignment that can exist between collocated actors engaged in hybrid arrangements.

In the second study, we delve into the characteristics and challenges associated with fostering a vibrant office environment while engaging in hybrid collaborations. Our focus centers on the actors and contexts involved, and we achieve this through ethnographic research conducted at various companies. The selected companies all face challenges in terms of bringing employees back to the office, fostering a sense of belonging, and accommodating the hybrid work model. Although the ethnographic work is still ongoing, preliminary results indicate a misalignment between the objectives of the companies and the conditions that employees encounter in their work. These findings are intended to be submitted to CSCW 2024.

Looking ahead, our future work will address the unique challenges in coordinating efforts within hybrid environments. By building upon existing frameworks within CSCW (e.g. [21, 22, 27]), we aim to explore and identify the dimensions that constitute hybrid work environments.

## 4 CURRENT AND EXPECTED CONTRIBUTION

Through the examination of previous literature that presents empirical cases of hybrid work, we have proposed a definition of hybrid work. This effort has positioned hybrid work within the broader spectrum of cooperative work while also shedding light on a distinctive challenge inherent in hybrid cooperative arrangements. Moving forward, our research will build upon and expand relevant concepts within CSCW to facilitate a comprehensive conceptualization of hybrid work. This endeavor aims to pinpoint the unique

characteristics and challenges specific to hybrid environments that distinguish these types of cooperative arrangements from both collocated and distributed cooperative work scenarios. The outcomes derived from the PhD research will be synthesized into a cohesive socio-technical framework designed for hybrid shared environments. Such a unified framework has the potential to significantly contribute to the theoretical understanding of effective cooperative technology design for the evolving landscape of hybrid work environments.

## ACKNOWLEDGMENTS

This work is supported by the Innovation Fund Denmark for the project DIREC (9142-00001B).

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