Juliane Busboom, Nina Boulus-Rødje (2023): Planning for hybrid cooperation - a design driven exploration. In: Proceedings of the 21st European Conference on Computer-Supported Cooperative Work: The International Venue on Practice-centered Computing on the Design of Cooperation Technologies - Exploratory Papers, Reports of the European Society for Socially Embedded Technologies (ISSN 2510-2591), DOI: 10.48340/ecscw2023_ep02.

Planning for hybrid cooperation - a design driven exploration

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Abstract. Hybrid work has become popular in post-pandemic times, helping organisations in attracting/retaining employees by offering greater flexibility and alternative modes of working. Despite the great interest in hybrid cooperation, recent research reveals prevailing challenges with current technologies and practices. In the search for the "right setup" for hybrid cooperation, some research tends to narrowly focus on developing technical solutions for rather isolated problems. In this paper, we wish to problematize these tendencies found in the literature and shortcomings in current technologies and practices, by shedding light on articulation work-an overlooked aspect related to managing hybrid work. The paper presents Collab.ai, a fictional AI-powered calendar and planning tool that re-imagines the planning for hybrid cooperation, followed by three additional artifacts that are aimed at amplifying various aspects of Collab.ai. Using a discursive design approach, the paper and these artifacts are aimed at sparking reflections on future hybrid cooperation tools and practices.

Introduction

The professional social networking site Linkedin, launched a new feature in 2022 which makes it now possible to search for job openings based on the preferred type

of workplace: on-site, remote or hybrid (Turner, 2022). This development indicates how organizations have adapted to the new demands of employees that came in the wake of the Covid-19 pandemic, calling for more flexible and alternative models of work (Tang et al., 2022). Today, especially hybrid models are attracting greater attention in many organizations, as they offer employees greater flexibility while still preserving a degree of control and stability for employers (Sokolic, 2022). It seems that hybrid work performs well as a concept and a managerial practice, as it has the capacity to attract and retain people by offering a partly remote and partly on-site workplace (Swain et al., 2020; Gray et al., 2020). However, when it comes to the execution and facilitation of hybrid cooperation–meaning everyday collaboration and coordination–recent research identifies a broad range of challenges related to technological infrastructure, social inclusion, and the workspace itself, which seems to slow down the desired acceleration of hybrid cooperation (Saatçi et al., 2019).

Both academics and corporate researchers are spending a considerably high amount of time and resources searching for solutions that better support hybrid cooperation (e.g., Neumayr et al. (2021)). While most researchers acknowledge that there is no one-size-fits-all solution, many of the technologies presented in their papers tend to propose technical quick fixes (Grønbæk et al., 2021; Rintel et al., 2021). Reviewing recent research literature reveals a strong quest for finding the "right setup", focusing on developing technological solutions to support and improve the execution of hybrid cooperation. However, little research could be found on the aspects of preparation and planning that are necessary to enable hybrid synchronous cooperation. In other words, not enough attention has been paid to what has been labeled as ‘articulation work’ (Strauss et al., 1985), meaning the informal work that is necessary to ensure smooth coordination and manage the distributed and contingent nature of work (*ibid.*). Articulation work is an integral part of managing any kind of cooperative work (Schmidt and Bannon, 1992), and it plays a larger role in distributed cooperative settings (Matthiesen et al., 2014).

However, when cooperation is not only distributed across geographical and socio-cultural boundaries, but also carried out synchronously in a hybrid setting, the importance of articulation work becomes amplified, requiring complex organizational and technical infrastructures and considerations (Duckert et al., 2022). Planning for a synchronous hybrid cooperation, necessitates a higher degree of articulation work, as it entails not only coordinating schedules and interdependent tasks, but a wide range of considerations related to the configuration—the choice and positioning—of the people (collocated and remote participants), as well as devices and tools in the physical and online workspace setup, depending on the type of cooperative task.

Looking at the features offered by current online calendars and videoconferencing tools, their overall core functionality has remained relatively consistent, with minor improvements, such as better integration with other productivity tools and for instance, the possibility to add a video-call link to a

calendar invitation. However, a video-call link is not enough to support a hybrid synchronous meeting.

Therefore, this paper is intended to spark a discussion which explores the following research question: *How might current tools and practices for preparation and planning of hybrid work be re-imagined to incorporate articulation work?* This question is ultimately intended to generate a set of speculations about future tools and practices that better support synchronous hybrid cooperation. To answer the research question, the paper starts by analyzing the technical affordances of three calendar- and planning tools and illustrates how these tools focus narrowly on booking meetings, overlooking the articulation work that needs to be carried out in order to enable hybrid synchronous cooperation. We then present Collab.ai, a fictional planning tool designed by the first author, to generate alternative conceptualizations that focus on planning collaborations rather than meetings or events, and takes into account the articulation work necessary for hybrid collaborations. To aid the speculative exercise, this core artifact is followed by three supportive artifacts intended to amplify different aspects of Collab.ai and shed light on its potential implications. As the first step of this work-in-progress, we wish to present the designed artifacts for CSCW researchers, and later for organizations working in hybrid setups, in order to generate rich reflections that can be used for the design of future tools and practices for hybrid work.

The remainder of the paper is structured as follows: in the next section, we provide a brief review of the literature about distributed hybrid work, making the case for the importance of articulation work. This is followed by an analysis of digital calendar and planning apps and a presentation of our design approach, setting the stage for presenting the set of discursive artifacts and explaining the intention behind their design.

Hybrid (Cooperative) Work

The search for the "right setup" for hybrid cooperation

While hybrid work has become a popular model of working in post-pandemic times (Sokolic, 2022; Neumayr et al., 2022), recent research reveals prevailing challenges with daily collaboration and task completion in hybrid settings, which seems to limit the presumed efficiency and success of hybrid cooperation (Saatçi et al., 2019, 2020; Teevan et al., 2020, 2022). These challenges result from the asymmetries in the relationships between people and things that unavoidably occur in hybrid settings (Duckert et al., 2022), which in turn introduce new uncertainties related to technical infrastructure, social and cultural inclusion, as well as the space in which hybrid cooperation takes place (Saatçi et al., 2019).

Underlying many of these challenges is the strong desire to find the so-called "right setup" for hybrid cooperation. This includes the right setup to avoid technical breakdowns or sound and audio problems across remote and on-site participants (Saatçi et al., 2019; Yankelovich et al., 2004; Tan and Kondoz, 2008). The right

setup to avoid exclusion of remote participants when on-site participants socialize and have informal conversations (Yankelovich et al., 2007; Karis et al., 2016; Saatçi et al., 2020). And the right setup for the workspace to support aligning physical objects with virtual elements and help task completion at distance (Yankelovich et al., 2004; Saatçi et al., 2020; Augstein et al., 2022).

Subsequently, a growing number of academics as well as corporate researchers is currently exploring various technical solutions aimed at improving social inclusion through, for instance, the use of remote gaze visualization (Xu et al., 2017) and conferencing systems that actively allow for social time (Gonzalez Diaz et al., 2022; Rintel et al., 2021). Others, explore ways of alleviating the challenges of a distributed workspace through the use of malleable videoconferencing systems (Grønbæk et al., 2021; O'hara et al., 2011) and distributed tabletop activities (Rädle et al., 2014; Yamashita et al., 2011). While others, dedicate their efforts to developing solutions that improve the technological infrastructure (e.g., sound, audio and visualization) (Hradis et al., 2012). Common to these studies is a strong focus on technological tools to support the execution of hybrid cooperation (e.g., Neumayr et al. (2021)).

Nonetheless, many of the challenges associated with hybrid cooperation relate to the preparation and planning, rather than the execution of hybrid cooperation. Saatçi et al. (2020) take a first leap into this direction of focusing on planning by proposing the replacement of a user-centered with a meeting-centered approach, arguing that 'complex ecologies of people, technology, spatial, and institutional organization must be made relevant in the process of design for more inclusive hybrid meetings' (p.769). Considering the configuration of the workspace setting is always important, but it becomes more pertinent in hybrid collaborative settings. Yet many of our current technologies and practices have not been fully adapted to hybrid cooperation. Post pandemic-times, we find minor changes done in physical workspaces (i.e., adding cameras and loudspeakers to meeting rooms) and online tools (i.e., introducing new functionalities and better integration with other tools such as online calendars, collaboration apps and videoconferencing tools). But these are all rather minor adaptations, insufficient in supporting hybrid cooperation which requires much greater articulation work.

Articulating and planning hybrid cooperation

Articulation work refers to all the extra work that is necessary for handling mutual dependencies in cooperative work arrangements (Schmidt and Bannon, 1992). The concept — originally coined by Strauss et al. (1985) — refers to refers to 'all tasks involved in assembling, scheduling, monitoring and coordinating all the steps necessary to complete a production task...' (Gerson and Star, 1986, p.166). In other words, articulation work refers to communication and coordination efforts required to achieve shared understanding and effective collaboration, and it tends to be invisible (Suchman, 1996). It 'includes both temporal co-ordination (sequencing

the inputs of different actors over time) and spatial co-ordination (ensuring that the right people and artefacts are in the right place)' (Greenhalgh et al., 2014, p.6).

The concept has played a major role in the CSCW field since its inception, generating studies that shed light on the crucial role that articulation work plays in managing the distributed nature of cooperative work (Schmidt and Bannon, 1992; Lee, 2007; Schneider and Wagner, 1992), These studies have been important in the discussions about how to design systems that better support not only the formal work, but also the "extra work" necessary to make distributed collaboration work in practice (Grinter, 1996). The general argument in CSCW has been that technological systems should be designed to reduce the amount of articulation work (Schmidt and Bannon, 1992; Schmidt and Simonee, 1996), and since the 1980s various systems have been designed to support coordination management (Grinter, 1996; Divitini and Simone, 2000).

Articulation work was found to have a critical role particularly in the management of globally distributed projects, such as in the context of global software development. In such settings, coordinating interdependent tasks and people distributed across organizational, geographical, and temporal socio-cultural boundaries becomes much more complex (Matthiesen et al., 2014). Furthermore, when distributed collaboration is carried out synchronously and in a hybrid format, it adds additional layers of complexity, as the collaborative space is composed of both a physical and a virtual workspace, introducing unavoidably multiple asymmetries in terms of access to tools, technologies, and things.

Therefore, hybrid cooperation requires a greater amount of articulation work. This includes, for instance, determining the positioning of the technological devices (e.g., camera, projector, loud-speakers) vis-a-vis the physical and remote participants, selecting the types of collaborative tools to be used (e.g., physical vs. online whiteboard), ensuring that both physical and online participants have access to the collaborative space and that it is visible for all, etc. Current technologies and practices of hybrid cooperation seem to fall short in supporting articulation work.

Every cooperation entails meetings to communicate tasks and manage dependencies. Meetings are, therefore, crucial for any cooperative arrangement, and it has been said that we have been witnessing the emergence of an increasing "meetingisation" of work which stems from the growing need for collective means of social orientation and coordination (van Vree, 2019). Digital calendars are often used to facilitate and coordinate meetings (Builtwith, 2023), as they make visible people's schedule and thus minimize the time spent on checking people's availability and convenience. Looking at the features offered by these online calendars, very little has changed since 1985. Their overall core functionality has remained relatively consistent, except for the possibility to integrate these with other productivity tools and enhanced mobile access. Furthermore, post-corona, many online calendars have added the possibility to incorporate a video-call link to accommodate online or hybrid meeting (Bergmann et al., 2022).

However, as is evident from the recent studies about hybrid work mentioned in the above section (e.g., Saatçi et al. (2019); Duckert et al. (2022)), a video-call link

is not enough to support a hybrid meeting, which requires various considerations that needs to be taken into account to accommodate both the physical and online cooperation space. Furthermore, these considerations related to the settings differ depending on the type of meeting or task. After all, there are many different types of meetings, for example, information seeking, problem solving, giving information, generation/discussion of ideas, delegation of work, inspection of fixed objects, decision making, negotiation, and presentations (Pye, 1978).

This match between the tool and the type of meeting/task has been identified as important (Easton et al., 1990), as these different types of meetings require a different setup involving different types of participants, collaborative tools and cooperative space.

To explore this match and spark thoughts around current planning practice, we designed a fictional AI powered calendar and planning app named Collab.ai that automatically matches the necessary setup of participants, tools and devices suitable for the different types of meetings. We inscribe Pye's (1978) classification in the design of Collab.ai, to make a clear distinction between the different types of meetings, and the different articulation work these require. Before we present the Collab.ai artifact, we will present an analysis of existing calendar and planning apps.

Design analysis of digital calendar and planning apps

In this section we draw upon principles of interaction design (Norman, 2013) to analyse three different but commonly used digital calendar and planning apps[1]. We examine the technological affordances of Apple's iCal, Microsoft Outlook Calendar and Google Calendar, and evaluate their ability to support the articulation work necessary for hybrid cooperation.

The analysis focuses on the *visual hierarchy*, meaning the ability of the digital planning tools to guide the users to the most important elements through the use of variations in color and contrast, scale, and grouping (Gordon, 2021). This can give us an indication of the prioritization of functionalities of these applications.

All three tools define the title as the initial and thereby most important element to fill out (Figure 1). In all cases there are no constraints nor feedforwards (i.e., information that helps answer questions related to execution (doing) while interacting with an artifact) that guide the user towards a preferred type of input. While Apple iCal uses color and grouping to indicate that "location or videocall" is as important as the title, Google and Outlook Calendar prioritize the time and date as well as the involved people, before offering an input field for location. Google Calendar distinguishes between "add video conferencing" and "location", while Outlook does not explicitly offer an input field for a link to a videocall or virtual

[1] For the purpose of this paper, we decided to focus on the interface of these digital calendars as displayed in mobile devices. We acknowledge that the interface of these calendars is different when displayed on computers.

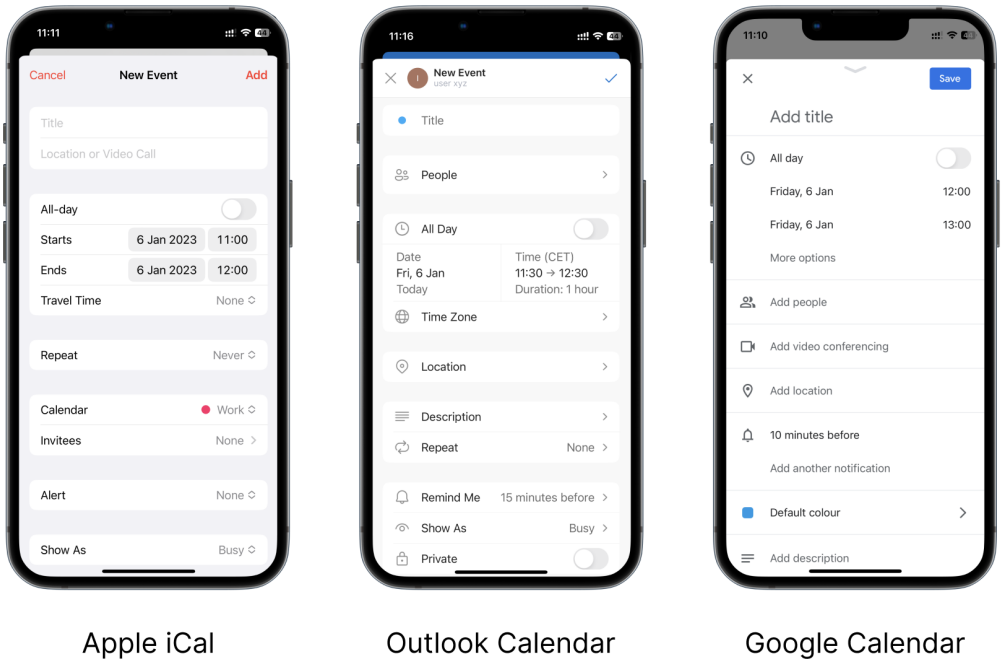

Figure 1. Comparison of common digital calendar and planning tools.

room as –in their mobile version– this is done through Microsoft's other app Microsoft Teams. Apple iCal prioritizes time and date in the second place, and all tools provide the possibility of inserting a note or description.

To sum up, the three digital planning tools have a rather similar setup, affording generally the same functionalities in terms of planning according to title *(what)*, time and date *(when)* and people involved *(who)*. However, what stands out is that these tools do not afford planning for the *"how"*, meaning specifying the required features of the meeting support tool and the type of meeting it intends to support; attributes which are important for supporting hybrid cooperation (Easton et al., 1990). Since hybrid cooperation seems to have come to stay (Sokolic, 2022; Tang et al., 2022) it raises the question, why common digital planning tools have not yet adapted to these new models of working. To generate alternative conceptualizations about how such tools could be re-imagined, we draw upon discursive design.

Discursive design as a method

Using research in order to create and reflect upon alternative futures of technologies and design, have become of greater interest in contemporary HCI and design studies. This has been commonly referred to research-through-design methods, and includes for instance, speculative design (Auger, 2013; Dunne and Raby, 2013; Tonkinwise, 2014) critical design (Dunne and Raby, 2001; Dunne, 2008), adversarial design (DiSalvo, 2012), and design fiction (Bleecker, 2015).

Common to these designs is that they mobilize the language of seemingly utilitarian objects of design to communicate ideas, operate as tools for thinking through issues, and raise awareness related to psychological, sociological, and ideological consequences (Tharp and Tharp, 2019).

Thus, Tharp and Tharp (2019) coined the umbrella term "discursive design" which consolidates these different approaches and emphasizes their primary motivation which is achieving audience reflection. They highlight that discursive artifacts are 'objects of utility that carry ideas; they function (or are imagined to function) in the world but their discursive voice is what is most important and ultimately their reason for being' (*ibid.* p.51). In this way, discursive design distinguishes itself from affirmative design, as the former focuses on problematizing and legitimizing alternative discourses while the latter focuses on solving problems.

Some researchers focus on how we create futures and how we ensure that the message of the designed artifact reaches the audience in an appealing way through material expression (Dunne and Raby, 2001), scenarios (Candy, 2010; Candy and Dunagan, 2017) and other mediated artifacts (Bleecker, 2015). James Auger who coined the practice of speculative design argues that a careful management of the speculation is important for the success of speculative design projects. This is done through the development of a "perceptual bridge" between the audiences' perceptions of their world and the fictional element of the concept. The concept must be "uncanny", meaning it must appear familiar but at the same time provocative and foreign (Auger, 2013). Auger (2013) states that 'the presence of the designed artifacts in popular culture allows for the viewer to project its presence into his or her own life. Then they effectively become the protagonist in the story, playing out individual and informative roles. Their reactions become the true products of this form of design research' (p. 20). Hence, the discursive designer also works prescriptive by planning and creating artifacts. However, 'rather than driving the design toward usefulness, usability and desirability, their goal is communicative in terms of encouraging reflection and initiating subsequent debate and response' (Tharp and Tharp, 2019, p.10).

Re-imagining planning for hybrid cooperation

Our speculative exploration consists of Collab.ai–the core artifact–a fictional calendar and planning app that intends to provoke reflections on the role of articulation work in enabling hybrid cooperation. This is followed by a presentation of three additional artifacts designed to shed light on different aspects of Collab.ai.

Presenting the speculative artifact: "Collab.ai"

The interactive prototype, Collab.ai is a fictional AI powered planning tool. Contrary to current planning tools like Google or Outlook Calendar, Collab.ai

automatically configures the “right setup” of a hybrid cooperation based on just a few input factors that are typed in by the user (title, type of collaboration according to Pye’s (1978) categorization and urgency of task). In a chatbot like manner, the user receives information and instructions as well as a time and date for the upcoming collaboration (Figure 2). Collab.ai provides different proposals for configurations depending on the type of collaboration. For example, Collab.ai suggests fully virtual collaboration for information seeking purposes, as this is the most efficient format for such meetings, both in terms of productivity and in terms of cost and CO2 friendliness (Figure 2, screen 3). On the other hand, for negotiation purposes it prescribes attendance in a partly augmented physical space and explains that ‘Negotiations demand closely coupled interactions. Thus, the workspace requires you to be visible – either as an avatar, via video or in person’ (Collab.ai, 2023, negotiation case).

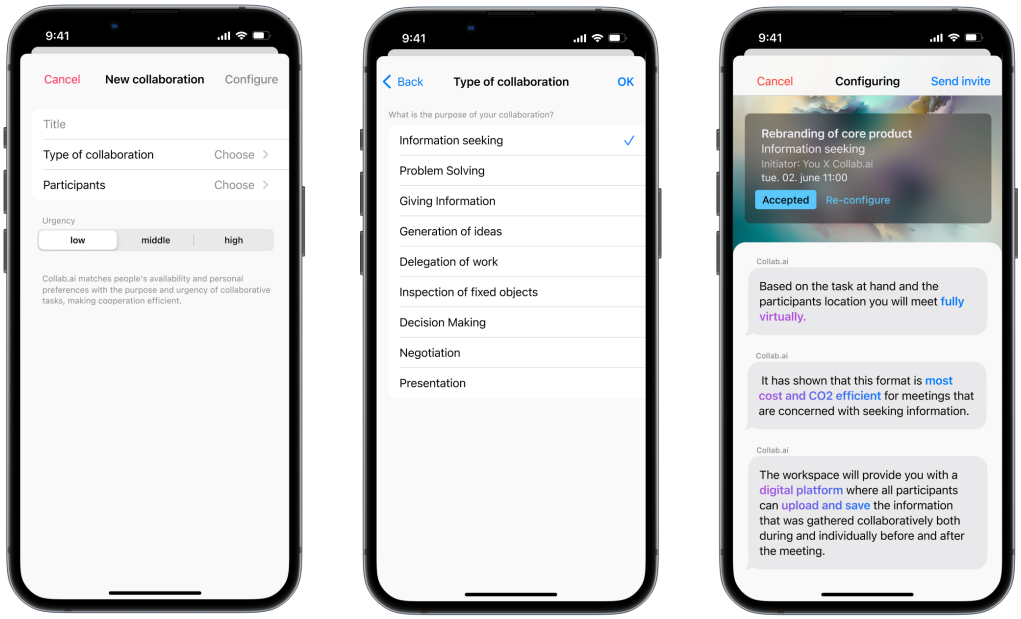

Figure 2. Three exemplary screens of Collab.ai. Link to interactive artifact.

The examples demonstrate how Collab.ai takes especially care of the spatial co-ordination (Greenhalgh et al., 2014) and matches all parameters required for planning effective hybrid cooperation. In other words, Collab.ai automates the articulation work involved in preparing and planning a hybrid cooperative meeting, by identifying and selecting the appropriate people to be involved (based on their relevance, areas of expertise, availability, preference of either remote or on-site work), and matching this with the cooperative activity and its specific attributes. This includes for instance, the location, types of technical tools and devices required and other features supporting the specific type of collaboration (e.g., automatically gathering all information in one place or recording and encrypting information) (Collab.ai, 2023).

Shaping the discourse: What if "Collab.ai" was real?

Collab.ai aims at shaping a discourse-through-design to create knowledge around the role of articulation work for hybrid cooperation. Here, the user-interface-design (UI) serves as the perceptual bridge (Auger, 2013) conveying familiarity with existing systems, while the functionality shapes the intended uncanniness (ibid.) aimed at evoking thoughts amongst the audience. Drawing the line to phenomenology in HCI (Dourish, 1999), the idea is to make the artifact at first sight appear "ready-at-hand" and familiar to the audience, but in fact re-design the functionality in the way that the artifact itself becomes "present-at-hand" and makes the audience reflect on their actions. This moment of reflection is the moment where Collab.ai is supposed to make the audience wonder.

The first moment of wondering is prolonged by three additional artifacts (1) a job opening add, (2) a video advertisement, and (3) a newspaper article, each intended to highlight specific aspects of the core artifact.

The job position

The first artifact is a fictional job position on the professional social networking platform LinkedIn looking for a "Collaboration Manager - enhancing hybrid work environments" (Figure 3). The job position is intended to provoke thoughts around the role of articulation work and organizational effort that is required for making hybrid cooperation work.

This artifact builds on the initially mentioned finding, that current attempts of finding the "right setup" (e.g., one-dimensional technical solutions, adaptations of existing systems like Zoom, etc.) seem to be insufficient in supporting hybrid collaboration.

By introducing a new type of job – a collaboration manager – that 'is responsible for managing and coordinating employees across digital and physical locations to ensure smooth and effective hybrid cooperation' (Job-position, 2023, para. 1), we aim to spark thoughts on the complexity and effort of making hybrid cooperation work. By making the effort very explicit as a new type of job we want to make the audience reflect upon their own practices–which are often complex yet invisible–related to planning for hybrid cooperation. In order to make the audience think beyond typical ways of facilitating hybrid cooperation like supporting video calls (with e.g. Zoom or Microsoft Teams), the job description indicates more advanced setups of hybrid cooperation that require the collaboration manager to 'implement and maintain cutting-edge communication and collaboration technologies such as virtual and augmented reality, AI-powered tools, intelligent automation, digital twin technology, and 5G networks, as well as coordinating team meetings and events' (*ibid.*). Finally, the job description is directly tied to the use of Collab.ai that is described as a non-human colleague: 'The collaboration manager will work closely with Collab.ai, the new planning tool that enhances hybrid work environments, to configure people's availability and personal

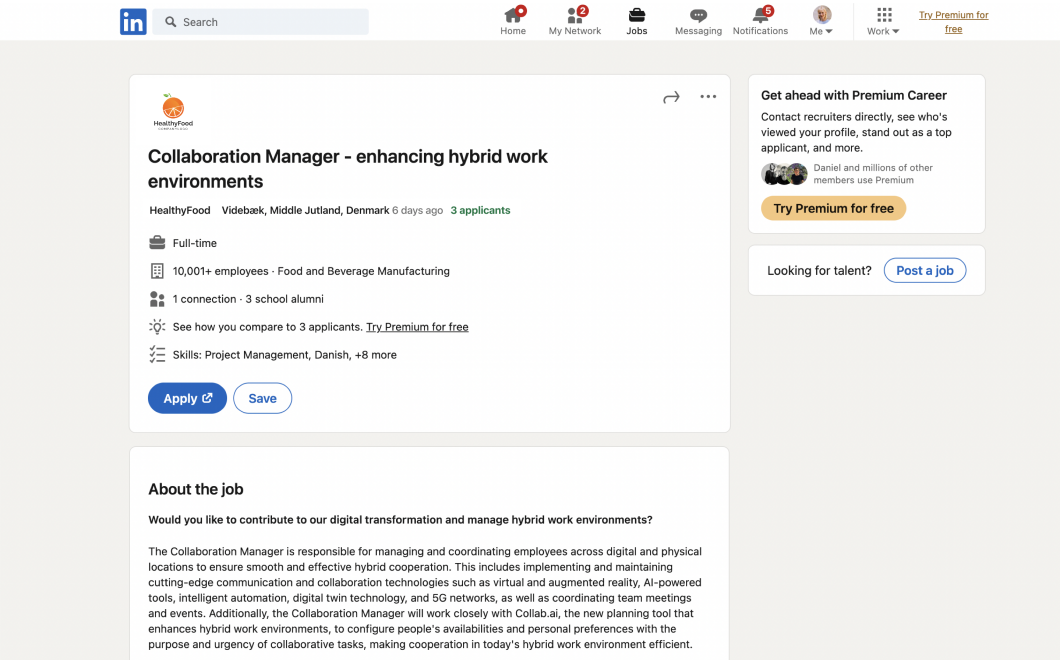

Figure 3. Fictional job posting on Linkedin looking for a Collaboration Manager. Link to interactive artifact.

preferences with the purpose and urgency of collaborative tasks, making cooperation in today's hybrid work environment efficient' (*ibid.*).

The advertising video

The second artifact is a fictional advertising video of Collab.ai (Figure 4), which was designed to bring forth reflections on human vs. technological intelligence regarding the preparation and planning of hybrid cooperation work, and the impact of this relationship on the autonomy to make decisions. It builds on the finding, that much of the recent research on hybrid work settings tends to narrowly focus on searching for technical solutions for rather isolated problems in the execution of hybrid collaboration. The video provocatively overstresses this approach by making Collab.ai appear as an intelligent companion that claims to be better at preparing and planning for hybrid cooperation than humans.

The video visualizes how Collab.ai "configures" automatically all the relevant parameters (type of collaboration, participants availability and collaboration preferences and urgency of task) and provides instructions regarding the most suitable workspace the collaboration should take place at, defining a fitting work atmosphere as well as helpful functionality that supports the specific type of collaboration.

The video starts by explaining the purpose and functionality of Collab.ai in a normative tone and conveys the feeling of a real-world product. It is only at the end of the advertising video, that the autonomous character of Collab.ai gets clear, with the following voice-over statement: 'Let's be honest – after 3 years pandemic and a

lot of training working from home we haven't figured out how to plan for efficient hybrid collaboration – let's leave the job to technology' (Advertising-video, 2023). The shift in rhetoric happens right after the video shows the intelligent and automatic configuration of all parameters and draws attention to the fact that all decisions are autonomously made by technology. A functionality that is aimed at provoking thoughts on the intellectual power relations between humans and technologies, and its impact on the autonomy to make decisions.

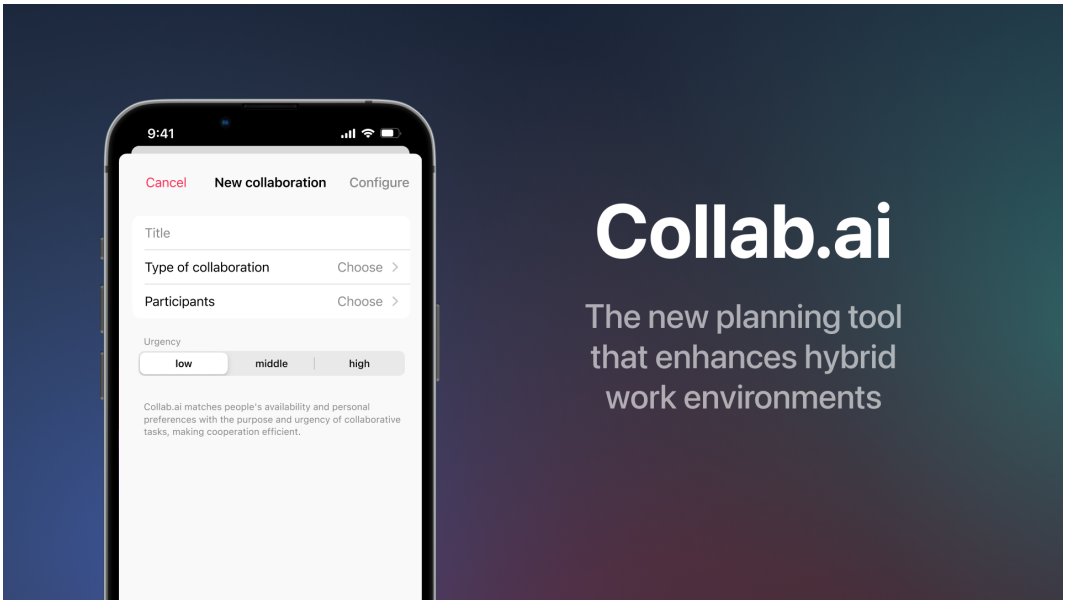

Figure 4. Start screen of the fictional advertising video for Collab.ai. Link to video.

The newspaper article

The third artifact is a fictional newspaper article (Figure 5) which is tagged as "world news" under the headline "iCal out, Collab.ai in: Apple's latest move to optimize hybrid work with AI technology". It was designed to provoke thoughts around the wider socio-cultural impact of changing work practices due to the rise of hybrid cooperation and builds on the initial findings from literature, that hybrid work practices have become common in many organizational contexts – especially after the pandemic. Changing practices can trigger further changes and transformations across individual, local or global levels.

This mediated artifact emphasizes such transformational character by announcing that Apple has decided to replace its own calendar tool iCal with the new AI planning tool –Collab.ai– in response to the changing nature of work in a post-covid world. By making the audience imagine that a tech giant like Apple replaces one of their core applications, we aim at sparking reflections upon the possible consequences of changing work practices related to hybrid cooperative work.

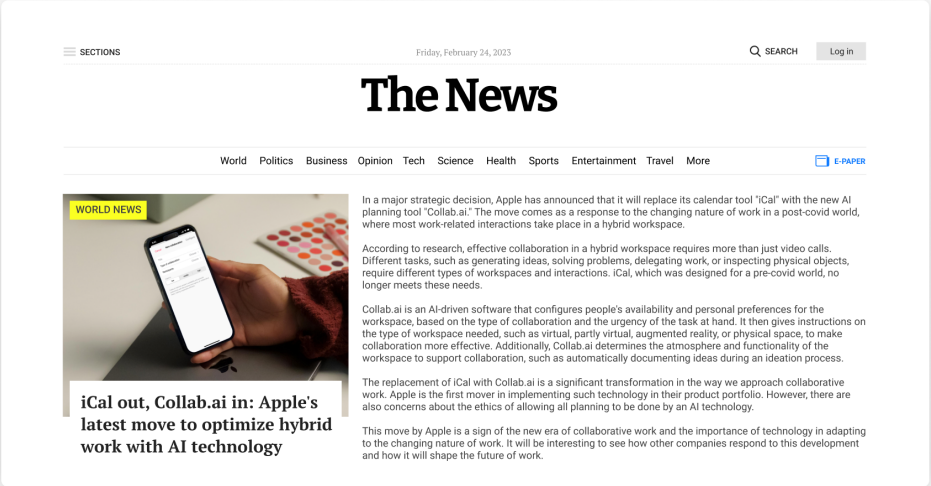

Figure 5. Fictional newspaper article on Apples strategic decision on replacing iCal with Collab.ai. Link to interactive artifact.

Reflections and Discussions

Electronic shared calendars were released to the market in the 1980s (Grudin and Palen, 1995), providing the capacity to reduce articulation work, as they help coordinate schedules, share information, assign tasks, etc. (Clement and Wagner, 1995). While this is still the case, current electronic calendars are not suitable for supporting the additional articulation work that planning for hybrid cooperation entails, which includes careful configuration of both the online and physical workspace, accommodating the diverse needs of online and collocated participants. Collab.ai automatically carries out these tasks related to preparation and planning for hybrid work, and thereby could be argued to remove the burden from humans, by providing the "right setup" regarding the complex organizational and technical configuration that a hybrid cooperation requires. This may raise various questions related to autonomy, as Collab.ai may be seen as taking autonomy from humans to determine their schedule.

Concerns related to autonomy were already voiced back in the end of 80s, with the introduction of the first digital calendars. At that time, there were some users who felt that these tools were overriding their personal boundaries, as they were making publicly visible all appointments and tasks, while reducing autonomy over their schedules. This has later led to a new functionality whereby current online shared calendar tools offer the option to control the visibility of the various appointments and tasks in their schedules.

This, the intellectual power relations between humans and technology and its impact on autonomy is one of the topics Collab.ai seeks to provoke thoughts upon (Advertising-video, 2023). Furthermore, it seeks to address the efforts needed to make hybrid cooperation work (Job-position, 2023) as well as the wider socio-cultural implications of changing work practices (Newspaper-article, 2023).

Each of the introduced artifacts was produced with the help of latest AI software. The content of both the news report and job description was produced with the help of Open'AI's ChatGPT[2] software that is trained to produce text, based on a user's query. It remembers what the user said earlier in the conversation and allows the user to provide follow-up corrections. In this way, one can produce very specific and individualized texts that automatically follow certain text structures required for the intended format. In addition, it is possible to ask the AI software to imagine possible futures on a certain topic. As it is trained on existing data and able to re-configure these in new ways, the output tends to appear highly plausible. The spoken text for the advertising video was optimized by the AI powered software Wordtune[3] and converted to audio with the help of the AI text to speech software NaturalReader[4].

Making use of these three different AI software is aimed at drawing attention to the accuracy and power of today's AI tools. The AI supported production of the artifacts acts thus as a speculation itself: Speculating to what extent a tool like Collab.ai could be a real-world product that is able to manage articulation work creating more efficient hybrid cooperation.

Indeed, Collab.ai offers promising features as it automates what seems as a mundane and simple task as scheduling and planning, by learning from past scheduling patterns and user preferences, thus providing a desired plan for the cooperative task that considers both organizational and technical requirements. This assumes, however, that planning and preparing a hybrid cooperation is a simple mechanical task of finding available slots, and selecting the right people based on their areas of expertise. Delegating the autonomy to the technology to make these decisions assumes that the various meetings and tasks in one's calendar all have the same weight. However, planning a cooperative engagement requires internal knowledge about hierarchies in the organizational settings; knowledge about power relations, entailing various political tactics. This raises the question of what happens when such tasks are delegated to intelligent machines that have strong processing power but lack human intuition and internal contextual knowledge that play a role in planning and preparation of cooperative engagements?

Final words

This exploratory paper outlined methods and materials to shed light on the role of articulation work for hybrid cooperation by employing discursive design practice. It is built on latest research from the fields of CSCW and HCI, and underpinned findings from literature with an analysis of common digital planning tools.

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2 ChatGPT. Link to website.

3 Wordtune. Link to website

4 NaturalReader. Link to website

Collab.ai which was designed to enhance hybrid work, was put at the center of this research-through-design intervention, supported by three additional artifacts. This collection of discursive artifacts was produced to spark reflection and generate insights on the potentialities of articulation work for hybrid cooperation.

As a work-in-progress this research-through-design intervention aims to present the designed artifacts for researchers working with the development of practices and technologies in order to generate design reflections.

To be clear, the purpose of this speculation is not to advocate for the design of AI driven tools that completely automate articulation work and take over the autonomy and decision making from humans. The purpose of this speculation was rather to shed light on the importance of articulation work when designing tools to support hybrid cooperation and illustrate the complexity that this might entail. There are certainly some aspects of articulation work that can be inscribed in the design of planning tools, but there needs to be a certain balance preserving space for human discretionary and autonomy to make decisions.

Acknowledgments

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

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