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Insights on the Impact of Gender and Technological Expertise in Augmented Reality Remote Collaboration

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Abstract. Solutions using Augmented Reality (AR) have been explored in recent times to address scenarios of remote collaboration in which team members are physically distributed. The literature illustrates that various user studies have been conducted to handle multiple types of tasks through the use of distinct AR methods and hardware. Regardless, given the novelty of this field, other important topics that may impact the collaborative process, and in turn, the insights collected have not been properly considered. This work discusses the impact of gender and technological expertise in remote AR user studies. A set of insights based on previous work are described. With this, we aim to raise awareness of the research community to these key aspects, and improve how the outcomes of the user studies are reported moving forward.

Introduction

Several activities in humans' daily life are becoming increasingly complex and interconnected, causing several problems, which cannot be resolved by a single individual. This happens since most expertise is only available in distant places, leading to the increasing need for remote collaboration, essential in various areas of application: industry, healthcare, education, and others. In fact, these were made clear recently, due to the constraints raised by the Pandemic (Steed et al., 2020; Matthews et al., 2021; Biehl et al., 2022; Narayanamurthy and Tortorella, 2021).

To address the nuances of remote activities, Augmented Reality (AR) has been explored (Jalo et al., 2018; Ens et al., 2019; Belen et al., 2019), combining the advantages of virtual environments and seamless interaction with real-world objects (Kim et al., 2018a,b; Sereno et al., 2020; Wang et al., 2021; Marques et al., 2022b; Martins et al., 2022b,a). It is possible to establish a common ground environment between distributed collaborators, i.e., serving as a basis for situation mapping, informing where to act, and what to do (Barroso et al., 2020; Marques et al., 2022c). In turn, this contributes to improved communication, enhanced task performance, as well as more efficient and easier collaboration (Piumsomboon et al., 2019; Ratcliffe et al., 2021; Marques et al., 2021).

The maturity of Collaborative AR has been positioned between the Replication and Empiricism stages of the BRETAM model, a concept useful to introduce new knowledge, technology, or products (Marques et al., 2022e). This reinforces the need to deepen the community's understanding of the collaborative process, which can be obtained by exploring novel methods, frameworks, and guidelines through various user studies (Marques et al., 2022e; Merino et al., 2020; Ratcliffe et al., 2021). However, the analyzes of recent surveys shows that most works focus on the data analysis from task performance and technological aspects or interaction mechanisms based on rather simpler procedures. For the field to move forward, other aspects must also be considered besides the ones already explored. An improved understanding can provide research teams with more contextualized data for conducting a more robust interpretation of what happens during remote scenarios, not only regarding overall AR technology performance, but also regarding other relevant aspects that may impact the collaborative work effort.

In this paper, we focus on gender and technological expertise which have not been the subject of interest by the community in recent years (Belen et al., 2019; Ens et al., 2019; Sereno et al., 2020; Wang et al., 2021; Krauß et al., 2021; Ratcliffe et al., 2021; Marques et al., 2021; Fidalgo et al., 2023), although other relevant aspects of the collaborative process also exist (e.g., social presence and cognitive load, task complexity, collaborative structure, familiarity with counterpart).

The exceptions are described next. Dey et al. (2018) conducted a systematic review associated with AR usability studies (2005-2014), showing that few addressed remote collaboration. In general, roughly 30% of the participants were females, suggesting a lack of diversity. Besides, no information regarding

participants' technological expertise was described in the said survey, possibly given the absence of such information in the publications analyzed.

Merino et al. (2020) conducted a systematic review addressing the topic of AR evaluations (2009–2019). Although there was no specific mention of remote collaboration, in general, user studies involved 5.761 participants, from which only 1.619 were female. For 93% of these, a median of 4 participants were females. For the remaining 7%, 16 females were reported, suggesting unbalanced genders frequently occur. There was no mention of participants' technological expertise.

Marques et al. (2022e) analyzed remote collaboration supported by AR through a systematic review (2000-2020), focusing on how user evaluation had been conducted. A total of 31 out of 42 papers (73.4%) involved female participants in their studies, with a ratio of less than 30%. Additionally, 32 out of 42 (76.2%) made no mention of participants' technological expertise.

No previous surveys reported the actual impact, if any, of gender and technological expertise on the work effort. Therefore, a comprehensive analysis of this subject is paramount. This opportunity motivated our research, aiming to raise the research community awareness, while also improving how results are reported, leading to a better understanding of Collaborative AR.

Insights from remote user studies supported by AR

Next, a set of studies from the authors, focused on remote user studies supported by AR are described. Each had a different goal, collecting information regarding the gender and technological expertise of its participants, among other aspects of the collaborative process.

Study 1 - Exploring the level of Social Presence

A user study was conducted to explore how team members' representation affected their social presence, as well as its impact on task resolution during remote guidance supported by video and AR conditions (Marques et al., 2023, 2022d). A real-life maintenance procedure was used, in which a remote expert using a computer-guided on-site participants (using a Hand-held Device (HHD)) in need of assistance (Figure 1). Tasks with similar level of difficulty and resources were used for each condition to minimize learning effects, including replacing interconnected components, plugging/unplugging energy modules. 37 participants were recruited (15 female - 40.5%), ranged from 20 to 63 years old ($M = 32.9$, $SD = 10.6$). They had various professions from different fields (Front-End Developers, Software Engineers, Tourism Manager, Housewife, Public Administration Officer, Physiotherapist, Banker, Manufacturing Manager, Assembly Line Operator, etc.) besides the traditional academic world, i.e., computer science students. From these, 18 participants had previous know-how of AR, and 33 of collaborative tools.

When categorizing the task time by gender, there was no significant difference between males and females for both conditions. Due to the lack of normality and

small dimension of the two independent samples instead of t-tests, non-parametric Mann-Whitney tests used (p-value=0.614 for the video condition, and p-value=0.725 for the AR condition). Moreover, when categorizing the task time by technological expertise with AR, significant differences between both conditions were also not detected using again, for the above-mentioned reasons, non-parametric Mann-Whitney test (p-value=0.245 for the video condition, and p-value=0.327 for the AR condition).

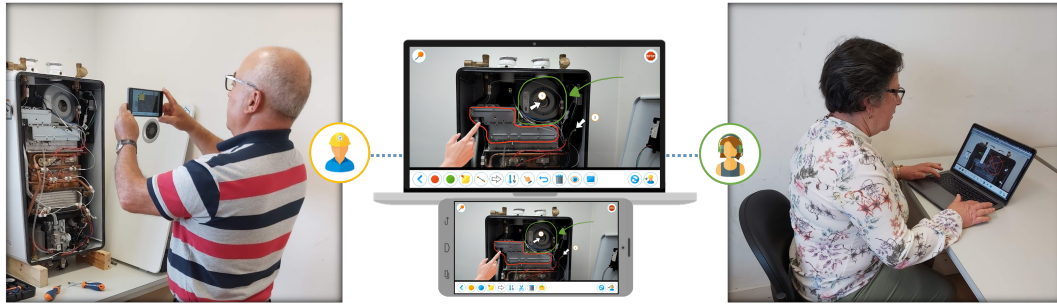


Figure 1. Remote scenario, having an on-site collaborator (with a HHD - Left) being assisted by a remote expert using a computer (Right).

Study 2 - Evaluating visual characteristics of step-by-step instructions

In a distinct study, the visual characteristics from a set of AR-based step-by-step instructions were evaluated based on five dimensions, Visual Complexity (VC), Visual Impact (VI), Clarity (CLA), Directed Focus (DF), Inference Support (IS), using a five-level Likert-type scale (from 1-very low to 5-very high). These instructions were created to explain to an on-site collaborator how to remove and install a new fan of a boiler (Marques et al., 2022a,b). 129 participants were recruited from two distinct continents (25 female - 19.4%), ranged from 20 to 45 years old ($M = 21.3$, $SD = 3.4$). As before, participants had various backgrounds, 58 of them (45%) had previous experience with AR and 126 participants (97.7%) with remote collaboration.

When categorizing the AR-instructions by **gender**, there was no significant difference for each of the five steps used when applying the non-parametric Mann-Whitney test (ordinal scale and independent samples); for each step, the p-values ranges were: step 1, p-value $\in [0.073, 0.889]$; step 2, p-value $\in [0.094, 0.993]$; step 3, p-value $\in [0.258, 0.666]$; step 4, p-value $\in [0.173, 0.689]$; step 5, p-value $\in [0.070, 0.764]$. Regardless, we recognize that a reduced number of females was considered and that in the future, a more balanced sample must be considered. Furthermore, when categorizing each step according to the **technological expertise with AR**, using again the non-parametric Mann-Whitney test, there was no significant difference, with the exception of one step. Later, it was perceived that this step presented a higher amount of AR content, which possibly affected participants understanding.

Study 3 - Comparing different creation and display methods

More recently, different creation and display methods for asynchronous AR-remote collaboration were explored, focusing on two distinct roles: remote and on-site. Plus, different task scenarios were included (Figure 2). The first part of the study focused on the remote counterpart, particularly identifying which method (laptop computer; video wall & keyboard; interactive projector) stands out for the tasks considered (Lego pieces assembly; Tangram puzzle assembly; Maintenance procedure; Learning activity on a map; Training activity on a laboratory). 30 participants were recruited for a within-group experimental design (11 female - 36.7%), whose ages ranged from 20 to 63 years old ($M = 29.87$, $SD = 10.13$), and expressed their preference concerning the three methods, as well as opinion on the potential to support one-to-many collaboration scenarios, using a 7-point Likert-type scale. Once again, participants had various backgrounds. All participants had previous know-how of AR and tools for remote collaboration. When categorizing the overall preference by gender, there was no significant difference between males and females in both cases when applying the non-parametric Mann-Whitney test (two independent samples and ordinal data) as follows: for the remote role and overall preference the obtained test results were, $p\text{-value}=0.966$, $p\text{-value}=0.767$, $p\text{-value}=0.800$, for the laptop computer, video-wall and keyboard, and interactive projector, respectively; for the potential to support one-to-many collaboration scenarios the test results were, $p\text{-value}=0.250$, $p\text{-value}=0.966$, $p\text{-value}=0.703$, for the laptop computer, video-wall and keyboard, and interactive projector, respectively. Regarding technological expertise with AR, this was not evaluated given that all participants had previous experience using collaborative tools, as well as with AR applications.

The second part of the study focused on the on-site counterpart, identifying which method (HHD; HHD & Articulated Support; Head-Mounted Display (HMD)) stands out for the tasks considered (same as before). 30 different participants were recruited for a within-group experimental design (14 female - 46.7%), whose ages ranged from 19 to 64 years old ($M = 29.67$, $SD = 10.64$), and expressed their preference concerning the three methods using a 7-point Likert-type scale. Once again, participants had various backgrounds and all had previous know-how of AR and tools for remote collaboration. When categorizing the overall preference by gender, there was no significant difference between males and females as obtained by the non-parametric Mann-Whitney test (two independent samples and ordinal data) as follows: $p\text{-value}=0.294$, $p\text{-value}=0.918$, $p\text{-value}=0.759$ for the HHD, HHD and articulated support, and then HMD, respectively. As before, participants' technological expertise with AR was not evaluated as they all had previous experience with AR and remote collaboration tools.

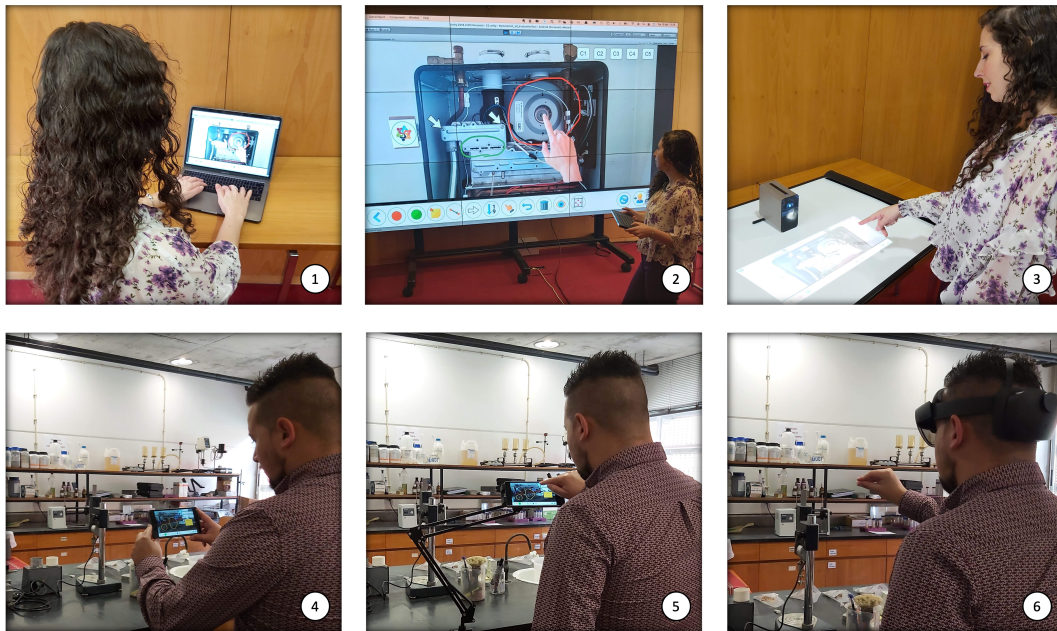


Figure 2. Remote scenario, having a remote expert using either a 1- laptop computer, 2- video wall & keyboard, or 3- interactive projector to create AR instructions to assist an on-site collaborator equipped with either a 4- HHD, 5- HHD & Articulated Support, or 6- HMD.

Summary

Overall, results associated with gender appear to contradict previous assumptions of recent decades linked with educational, social, and cultural aspects, i.e., *"that it made sense to categorize the results obtained based on gender"*. Even though the outcomes described cannot be generalized strictly based on these studies, we believe that for some situations, it may no longer be necessary to consider this division, as the distribution of participant gender appears to be vanishing. This represents a positive aspect, suggesting that the type of tasks considered can be conducted by everyone, a stigma that sometimes still exists in regards to some tasks like the maintenance procedures used. It must be highlighted that participants with multidisciplinary backgrounds were considered and not only computer science students, a trend that the authors believe should be pursued towards a more ecological sample, i.e., balanced sample with diversified backgrounds.

Regarding technological expertise with AR, it appears having previous experience is not a differentiating factor for faster completion. This can be a benefit, suggesting that collaborators with no prior experience are able to quickly use AR to express problems and learn from shared instructions. One example is industry scenarios, having untrained operators learn new skills and conduct specialized procedures when assisted by a remote expert. This may reduce production downtime, and costs, avoiding the need for longer travels. All of these

fit within the sustainable factors defended by the United Nations (UN) development goals¹.

Equally important, in order for understanding if the insights presented can be generalized with other results reported by the community, a systematic literature review must be conducted, considering a relevant time interval, as well as suitable conferences and journals. This step may also allow to better understand the importance of considering aspects that directly impact the collaborative process, besides the traditional ones already explored.

Final Remarks and Future Work

A set of user studies were described, referring to the impact of gender and technological expertise in remote AR scenarios. Results from data analysis illustrate no significant differences between gender or distinct technological expertise, which appear to contradict traditional paradigms found in previous literature when focusing on the use of AR. Despite, this should not be generalized to another disciplines. We also reflected on the impact of these insights and how they contribute to further work. Only by having a representative overview can the research community raise awareness and improve how data is collected and analyzed, leading to a better understanding of how various aspects affect remote collaboration supported by AR, thus, providing support for better transferability.

This work is being expanded by conducting a systematic literature review to verify if the results reported in this work align with what is being reported by other research teams. We also intend to contribute to the ecological validity by considering distinct use cases from the ones described in the literature, in particular by selecting application scenarios based on real-life situations and not toy problems. Also important, conducting more studies involving a more inclusive and gender-balanced distribution.

Acknowledgments

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¹ <https://sdgs.un.org/goals> [Accessed in February 2023].

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Václav Jaroš, Jakub Jaňura and Petr Svoboda (2023): Geolocation data as a research tool for the organization of the settlement system Case study of the spatial mobility model in Czechia. In: Proceedings of the 21st European Conference on Computer-Supported Cooperative Work: The International Venue on Practice-centred Computing on the Design of Cooperation Technologies - Posters, Reports of the European Society for Socially Embedded Technologies (ISSN 2510-2592), DOI: 10.48340/ecscw2023_p02

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Geolocation Data as a Research Tool for the Organization of the Settlement System

Case Study of the Spatial Mobility Model in Czechia

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Implemented as part of the project „Improvement in Conditions for Decentralization and Accessibility of State Administration in the Territory“ financed from EEA and Norway Funds 2014 – 2021.

Abstract

Geolocation data is a widely used source of the spatial information. Their great potential might be also used for population mobility research to identify spatial interactions forming the hierarchical structure of the settlement system. For this purpose, a model of data acquisition and their preliminary analysis was developed. This model represents an effective tool for mapping the mobility behaviour of the population. Using the example of Czechia, significant commuting links are identified, which are subsequently analysed in detail using GIS tools. Therefore, important commuting centres of different hierarchical levels are defined by the volume and nature of spatial interactions. This approach is used as a source of important expertise for the proposals on subsequent Czech public administration reform. Nevertheless, the entire model is generally transferable, and the entire method of using the geolocation data for mapping the hierarchy within the settlement system can be replicated in other countries as well.

Research explanation

The research is based on assumption that the settlement system represents a large set of complex processes between particular components of the society and the landscape variable in time and space. This process results in socio-spatial differentiation, which manifests itself the most as a spatial concentration of activities within society. The spatial concentration of activities is a natural process of development of social systems. A certain form of concentration is necessary, as it is not possible to ensure the availability of all activities, which have different degrees of rarity, in all locations equally. This is the very essence of the formation of settlement systems, which the concentration of activities allows to arise.

The interconnectedness of individual processes within the settlement system is so complex that it cannot be easily identified or even measured in any way. However, the external manifestations of these processes are measurable. These take the form of spatial interactions and manifest themselves as commuting relationships different at various hierarchical levels¹. They are thus realized through transport links which have been measured for long period by transport geographers². In general, the described spatial interactions can be called population mobility. It contains not only the actual journeys but also a reflection of the overall spatial pattern of each individual's behaviour. Hence, the mobility/commuting behaviour of an individual takes into account the repeatability of certain elements of spatial behaviour, which also determine the hierarchical position of the commuting destination and its relationship to the place of origin. In conclusion, the spatial behaviour of the population completely reflects the relationships and processes within the settlement system and therefore, it is a suitable object of measurement for their explication.

A wide range of tools can be used in both local and large-scale statistical surveys focused on the traffic behaviour/mobility of residents, such as questionnaire surveys, traffic diaries, GPS loggers, measuring passengers transported by individual modes of transport, or measuring traffic intensity. In the Czech Republic, queries about commuting to work and schools are even part of the census, however, these available statistics have a low return in recent censuses, and it is assumed that up to 40 % of commuting flows are missing from the census statistics. With this in mind, a significant potential for mobility measurement can be seen in the use of the **geolocation data of mobile operators**. Due to the high penetration of the population by mobile devices, and the possibility of tracking movement in unlimited random periods, this approach combines both the advantages of population-wide data collection and detailed (movement tracking) studies as well.

¹ See e.g., Hampl 2007; Hampl, Marada 2015

² See e.g., Marada 2010; Marada et al. 2016, Jaroš 2017, El-Geneidy, Levinson 2007.

The essence of the method are the records in the geolocation network, which are created every few minutes by every device joined to the GSM network via SIM cards. Determining the location is approximate by this technique, as only the transmitter that registered the recording is precisely located. From the signal coverage map of individual transmitters, the approximate location of the SIM card can be deduced with an accuracy of hundreds of meters in urbanized areas and up to a few kilometres in rural areas.

In order to obtain this type of data, it is necessary to set up a complex mechanism of tools analysing more than 10 million SIM cards (the case of the Czech Republic), each of which produces thousands of records within the measured periods. In addition to the technical solution and considerable computing capacity required for Big Data processing itself. Besides, it is also essential to consistently establish methodological procedures for the preliminary processing of primary records for the creation of databases of citizens' mobility/travel behaviour.

In the past, it was the method of data claiming that was the main obstacle in the use of geolocation data concerning their low validity³. Research carried out in the past in the field of data analysis of mobile operators had to solve problems of representativeness of data and their evidential value when generalizing to the population⁴. Although this shortcoming is not an obstacle for use in research from the technical fields aimed at measuring the volume of journeys made or data transmitted, in the field of social geography the question of the generalizability of data to the population and the projection of spatial patterns of behaviours onto entire society in space and time is absolutely essential. For this purpose, a unique model was created, including a complete range of interconnected processes, which captures the mobility of the population and projects it on the social and settlement networks.

The whole model is based on the presumption that mobile phones move together with their users for most of the day⁵. Based on this assumption, the model eliminates records created by other devices than mobile phones, thereby largely eliminating the problem of duplicate records of a single user of multiple devices. Similarly, rarely used SIM cards that do not make enough records in the network are neglected. Furthermore, the assumption of high penetration of the population by mobile phones is also crucial. In general, it can be concluded that in contemporary societies of developed countries, both assumptions are fulfilled.

When detecting the movement or stay of the SIM card, the proposed model must solve the problem of the inconsistency of the administrative boundaries of the municipalities with the boundaries of the signal

³ Mentioned in more detail e.g., by Mazouch et al. 2017; Novák 2010; MV 2020.

⁴ See e.g., Šveda, Barlík 2018; Halás et. al. 2021. ⁵

Mentioned in e.g., Novak 2010, MV 2020.

transmitter's service area (cells). In reality, it is common for one transmitter to serve several municipalities or their parts at the same time. In addition, overlapping of service areas (cells) of different transmitters is common as well. The detection of stay/movement itself and its assignment to particular territorial units (municipalities) occurs via the cell-mapping process. This tool distributes the measured records between specific settlements (municipalities) according to the amount of intravillan (build-up area) of each settlement extending into a specific cell (service area of the signal transmitter) and also reflecting the population density of each settlement. In conjunction with the clustering algorithm, cell mapping can eliminate the unwanted effects of so-called cell jitter ("random" switching between neighbouring transmitters)⁵. Databases obtained through this model also removes other undesirable elements that worsen the evidential value of the data, such as the share of virtual operators using the network, ownership of multiple SIM cards by one user, or on the contrary, not owning a mobile phone and thus no SIM cards. All these aspects are taken into account by the model. In addition, the model also contains relocation mechanisms that are capable to correct retroactively any model errors in assigning the records to individual territorial units. At the same time, sufficient anonymization of the final data is ensured.

This model is flexible in terms of the output databases produced. According to the primary setting, it produces a total of 15 attributes on the territorial detail of individual municipalities, structured into 3 basic interconnected datasets: a) statistical data for individual municipalities and characteristics of their residents, b) OD matrix showing commuting directions taking into account a total of 6 types of commuting intensity, and c) the average number of currently present population in every hour of the week (24/7) in each municipality with a breakdown by particular attributes.

The method of assigning attributes to individual users in the network is also unique. Basically, the method does not monitor the actual volumes of the trips made but analyses the commuting rhythms and the overall spatial commuting behaviour of each SIM card user. During the monitored period (28 days), "labels" of attributes are assigned to each SIM card according to its unique pattern of spatial behaviour. Each individual (SIM card user) can only have one label for each municipality, but he can have several labels for several municipalities - can be a resident in one municipality, commute to another for work or school, commute for services, or be an occasional visitor to another etc. The output databases themselves do not indicate specific measured values for a certain day or period, but each attribute represents basically the number of people who reports a given type of behaviour. This is no longer the geolocation data itself, but a summary of time-spatially aggregated statistics about geolocation data.

⁵ For more details see MV 2020; Mazouch 2017.

The output databases enable subsequent applications of geographic analyses identifying functionally integrated regions and their central areas at different hierarchical levels. Based on the principle of commuting to certain centres, the intensity and volume of these interactions, relatively closed (in terms of functional closeness of the interactions) and internally integrated regions are formed.

Primarily, the method is set to identify functional micro-regional commuting links. Microregions are territories in which a resident should be able to secure all his daily activities necessary and important for his everyday life. Their centres are primary commuting destinations for their surroundings and provide a sufficient range of job opportunities, primary and secondary education, health services, shops, etc. Visiting centres of a higher hierarchical levels providing services of a higher grade, however, is not needed daily. Nevertheless, thanks to the robustness of the analysed data, it is also possible to define centres of higher (mezo-regional) or lower (submicro-regional) levels. Therefore, this method enables the implementation of a complete socio-economic regionalization of the state at individual hierarchical size-levels, including their hierarchical relationships.

This approach was used in the Czech Republic for a comprehensive revision of the spatial units of the public administration structure. The purpose of this activity was to harmonize the administrative units with natural commuting regions. Particularly, the aim was to ensure that public administration offices were located where people naturally concentrated. This leads to streamlining and deconcentration of the public administration and its adaptation to the needs of citizens. Based on this application example, it is also possible to conclude about the transferability of this approach and its applicability both in other territories (states) or in other scientific fields.

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Ann Light, Chiara Rossitto, Airi Lampinen, Andrea Botero (2023): The Ecological Underpinnings and Future Contributions of (E)CSCW. In: Proceedings of the 21st European Conference on Computer-Supported Cooperative Work: The International Venue on Practice-centred Computing on the Design of Cooperation Technologies - Panel, Reports of the European Society for Socially Embedded Technologies (ISSN 2510-2591), DOI: 10.48340/ecscw2023_pa01

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The Ecological Underpinnings and Future Contributions of (E)CSCW

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Abstract. When times change rapidly, the transformations around us ask us to consider whether our practices of research and scholarship are keeping abreast. Multiple crises are bearing down on us and only a change in Global North lifestyles and values will begin to address the world's course towards major catastrophe. In this highly interactive panel, we unravel the ecological underpinnings of (E)CSCW to understand how it could contribute more fully to different sustainabilities and alternative futures. We consider (E)CSCW to offer a strength in its practice-oriented roots and its ecological understanding of socio-technical relations. We revisit these qualities in light of the need to embrace interdependence in all aspects of life and invite others to think with us about possible futures and the contributions (E)CSCW scholarship is poised to make in working toward them.

Introduction

With its interest in groups, organizations, practice, and the impact of socio-technical developments, CSCW is an intrinsically ecological discipline. National Geographic defines ecology as *'the study of organisms and how they*

*interact with the environment around them*¹, thus emphasizing the relations between living things and their habitats, between biological and socio-technical systems.

Further, in a world that can be characterized by the concept of polycrisis and consequent concern for worsening political, socioeconomic, and environmental conditions, we see relations between living things and their habitats as a matter for research across all disciplines — and especially those with a commitment to design (Light et al., 2017). To understand life on Earth and its future is increasingly to wrestle with the future of technology, its demands on resources, and its impact on how humans conduct themselves in relation to human and non-human others. With its interventionist stance and focus on design, the ECSCW community bears important responsibilities in this regard, in that *ecological* means concerned with the entanglement of practices and their impacts in particular settings. In this panel, we unravel the ecological underpinnings of ECSCW to understand how it could contribute more fully to different sustainabilities and alternative futures.

Isabelle Stengers talks of an '*ecology of practices*' and the '*production of values, (...) of new modes of evaluation, of new meanings*' in the context of this ecology. These values, evaluations and meanings do not replace older ones in any absolute sense, but '*are about the production of new relations that are added to a situation already produced by a multiplicity of relations*' (Stengers, 2010, p. 32). This destabilizes our truths and long-term knowledges, turning us back to an analysis of practice and emphasizing the instability of realities. It also speaks to the body of work emerging on planetary change that eschews technical solutions and superficial behaviour change models for system change and a rethinking of relations between species. It speaks to staying with the trouble (Haraway, 2016). To engage with these discourses is to question practices of design and the work we are designing for. It begs us to ask about the future of our technical structures and how we understand agency.

The study of collective and collaborative practice has been relevant to CSCW since its early days (Kuutti and Bannon, 2014) and has become a characterizing agenda for the European community, reflected by the number of anthropologists, ethnomethodologists, and sociologists who work in the field. Echoing Kuutti and Bannon's call to (re)consider human-computer interactions through a practice-based agenda, we argue that it is now time for ECSCW research to reinvigorate these approaches with an emphasis on how the community can attend to the challenges of intersecting crises. It has never been as important to encompass more just, socially, and environmentally sustainable futures, and CSCW offers both analytical lenses and generative models for doing so. Reflecting the two-folded agenda of the ECSCW research community, we see this as both an analytical and design endeavour, where concerns for understanding go hand in hand with the interventionist approach that has characterized much past work.

¹ <https://education.nationalgeographic.org/resource/ecology>

Related Literature

The practice paradigm has traditionally been a distinctive focus of ECSCW research. Primarily framing workplace studies, different approaches to practice have been central to the research community. Nicolini (2013), for instance, has identified six different theories of practice, namely, the prexology, practice as community, practice as activity, practice as accomplishment, practice as ‘the house of social’, and practice as discourse. Building on this, Kuutti and Bannon (2014) have unpacked how each of these theories has been influential to ECSCW to empirically illustrate: i) how structures, institutions, relations of power, or norms can be understood by the connections between different sets of practices; ii) the processes of becoming a central member of a community, where participating in core practices interweaves with learning skills, abilities, and with developing a sense of belonging; iii) core structures of activities and how they are shaped by tools and context; iv) how practices are locally and temporarily produced; v) how practices are historically formed; and vi) how they become manifest in the social organisation of conversations. Despite their differences, all these approaches draw attention to the performativity of organizations and institutions (they are enacted through situated practices), the materiality and agency of both humans and tools (both inevitably shape practices), and how knowledge can enable practices but also be produced through them.

In parallel to ECSCW’s concerns for investigating technology-mediated collaborative practices in the workplace, over the last fifteen years, HCI scholarship has developed a research focus on more sustainable computing in general, and on how to foster sustainability in and through design more specifically. Even HCI conferences need technologies for more sustainable activities, argue Shneiderman et al. (2023), as they point to the importance of developing a positive ethos, where *joyful sustainability* requires ‘*innovative thinking to alter behaviors of individuals, communities, corporations, cities, national, and international organizations*’². Attention to system change, the impact of technology, and the potential of collapse appear in yet another strand of technology-related work (Light et al., 2017; Nardi and Ekbja, 2017; Tomlinson, 2020).

Yet, despite well-consolidated critiques addressing persuasive technologies and a focus on individual behaviours, and despite calls to understand the socio-cultural, political, ecological, and infrastructural aspects underlying more environmentally sustainable computing, studies tend to disregard the collaborative work that enables care for the environment and makes it work. First, everything from legal regulation to waste management relies on collaborative practice. Second, mobilisation relies on arts, politics and civil action, all of which are, again, collaborative. As Dourish (2010) notes, there are possibilities to bring people together, not just for energy management, but to tackle progress on climate measures as a political activity. Where there has been a focus on changing small

² <https://interactions.acm.org/blog/view/joyful-sustainability-now-is-the-time>

aspects of people's lives (with tools that, for instance, monitor energy use, help people recycle and buy to reuse, connect with the wildlife and living things around them, and detect pollutants), it is less common to find technology designed to support system change as a whole, or to counter the impacts of the system changes that networked computing, social media, and other innovations are inadvertently introducing, with knock-on effects on civil action and resource use. It is also less common to find technology based on considerations of how changes towards more sustainable futures might require the interconnection and co-operation of several actions aiming at environmental care (Rossitto et al., 2022).

This panel seeks to bring together the practice trajectory of traditional (E)CSCW with the radical care needs of the next decades. Here, radical means 'from the root' in the sense that we can no longer expect business-as-usual but are on a long journey into the unknown. We may have an appreciation for the socio-technical but no conviction that our infrastructures will serve us well. (And it must be noted that present infrastructures serve some parts of the world a lot better than others.) Here, care means more than the act of support and management that speaks to dependencies, encompassing instead also a change in our understanding of relations, placing interdependencies front and centre.

Our questions for this panel, then, are large and demanding. We seek to set a direction for a practice that not only proves its relevance but puts (E)CSCW in the driving seat for intellectual and practical advances in a future of polycrisis. In particular, we ask:

- How partnerships and coalitions develop between the many actors (e.g., individuals, public institutions, private actors) that become involved in concrete acts of care for the environment.
- How collaboration unfolds over time between these actors.
- What capacities and motives drive participation while broadening inclusion.
- How care for the environment, which requires a long-term, arguably multi-life span perspective, can be framed so that we can collaborate over time.
- How we understand the role of other species and the balance of practices that might emerge if we include a wider constituency in the idea of collaboration.

Panelists

- Ann Light will chair the panel, setting the scene for an ambitious discussion about an ecological, relational vision for CSCW research.
- Chiara Rossitto will focus on environmental sustainability and environmental stewardship, in particular, drawing upon her research on waste management.
- Airi Lampinen will highlight social sustainability, drawing upon her expertise in ecologies of community initiatives and the work of sharing.
- Andrea Botero will share bits of an exploratory practice that combines walking, off the shelf video conferencing, good old locative media and forms

of feral environmental data to speculate on collaborative ways of caring for forest futures.

Session plan

We have deliberately planned this panel to be highly interactive with the audience. The talks that open it (5 minutes from each panelist and the chair) are there to act as provocation for discussion in the wider room. The chair will manage the transitions between parts of the session and keep time. We are not seeking controversy at the podium, but to present a range of stimuli to highlight both how (E)CSCW is well placed for taking serious issues of practice and complexity forward and what diverse aspects of sustainability can be invoked. The session will be structured in this way:

- Opening by chair
- Position statements from three panelists
- Questions of clarification
- Breakout time, where small groups can discuss issues and form their own positions/questions
- Comments from groups to the panel
- Panel responds
- Further discussion in room on questions set by chair (e.g. see above)
- Reporting back
- Final comments from panelists and chair as a summary to the session.

Biographies of panelists

The panel is organised by a group of scholars with significant experience in the collaborative work involved in fostering different sustainabilities, along with a longstanding engagement with the CSCW community:

Ann Light addresses the politics, ethics and agency of design, and especially co-design in communities, exploring social activism at neighbourhood level, investigating the design of sharing structures and questioning the boundaries of participation. She is Professor of Design and Creative Technology, University of Sussex, UK, and Professor at Malmö University, Sweden. Regarding the social and ecological as inextricably linked, Light has turned to consider the stress that current systems put on the planet, believing creative remaking of relations is needed for liveable futures. She is co-creator of the CreaTures Framework, prepared as part of the European Union project Creative Practices for Transformative Futures (CreaTures: <https://creatures-eu.org/>).

Chiara Rossitto is Associate Professor of Human-Computer Interaction at Stockholm University, Sweden, and Visiting Professor at the Centre for Sustainable and Digital Transformation, at Aalborg University, Denmark. She has

extensively investigated the role of digital technologies in fostering care, civic engagement, and people's participation in initiatives seeking more sustainable futures. Her research has investigated the use of digital technology to support and structure environmental stewardship and care for the environment, waste management practices, and political dialogues. Moreover, it has problematized scale as the only notion often associated with technological development and the long-term impact of technological interventions aiming at social change.

Airi Lampinen studies interpersonal and economic encounters, peer-to-peer exchange, and algorithmic systems. Her recent book *The Trouble With Sharing* (Lampinen, 2021) addresses the interpersonal challenges inherent in peer-to-peer exchange. Lampinen is Associate Professor in Human–Computer Interaction at Stockholm University, Sweden, and Docent in Social Psychology at the University of Helsinki, Finland. Currently, Lampinen is the co-PI of the WASP-HS project *Ethics as Enacted through Movement – Shaping and Being Shaped by Autonomous Systems*. She is also part of the Digital Futures faculty and co-leads two projects within the centre: *Layering Trust in Intimate Digital Health Technologies: Learning from Challenging Experiences* and *Digital Futures Drone Arena*.

Andrea Botero works with the possibilities, and contradictions of participating in the creation of environments, tools and media that afford more relational and caring interactions among, and between, people and their environment. She is Associate Professor at the School of Arts, Design and Architecture of Aalto University, Finland, and conspirator at the collective design studio Suo&co.

A provisional plan for running the panel virtually

Should the panel need to be run virtually, it would be possible to conduct the same process with the use of a video conferencing platform, such as Zoom, and open break-out rooms for discussion at the points noted above. In this case, the chair would be in charge of opening and closing these rooms and, instead of talking to neighbours, participants would be randomly put together in small groups.

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Implementing Electronic Health Records – Cases, Concepts, Questions

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Abstract. Electronic health records (EHRs) support patient treatment by providing healthcare professionals with the means to order, document, and follow up on the steps taken to treat and care for each patient. EHRs are complex systems and their implementation is a major undertaking, which has received sustained attention in computer-supported cooperative work (CSCW) and other research fields. This workshop aims to provide a forum for participants to get updated on current CSCW studies of EHR implementations and create connections with a select group of other CSCW researchers who study such implementations. Within the overall topic of EHR implementation, the workshop themes include, but are not limited to, case analyses, theoretically oriented pieces, discussion essays, stakeholder analyses, methodological reflections, and comparative pieces. The key activities at the workshop will be presentations of the participants' position papers and thematic discussions in break-out groups.

Introduction

Research on the implementation of electronic health records (EHRs) spans computer-supported cooperative work (CSCW), health informatics, information systems, and other fields. While the research in each of these fields has provided important insights, they remain partial and somewhat disconnected. Within CSCW alone, healthcare is a domain that has received sustained attention (Fitzpatrick and Ellingsen, 2012). This long-term attention continues in studies of many recent and ongoing EHR implementations (e.g., Zahlse et al., 2022; Zhang et al., 2022). It is difficult to stay up to date. This workshop provides a forum for getting updated on current studies and creating connections with other researchers in CSCW (and beyond) who study EHR implementations.

EHR implementation and use

EHRs support patient treatment by providing healthcare professionals with the means to order, document, and follow up on the steps taken to treat and care for each patient. Previously, this information was held in paper records, which were only available to one healthcare professional at a time. When EHRs started to replace paper records, the electronic records also started a long-term transition toward increased information sharing among healthcare professionals. This transition is particularly evident in large-scale EHR suites, such as those supplied by CERNER and EPIC. In addition to integrating still more intra-organization information into one database, these EHRs also increasingly support interorganizational workflows, with grand claims made for the impact of such implementations (Randell et al., 2019). The extension in scope is for example visible in three implementations of EPIC in the Nordic countries. In Denmark the implementation was restricted to hospitals; in Norway it spans hospitals, nursing homes, home-care services, and general practitioner (GP) clinics; and in Finland it spans all these institutions as well as part of the social services in the municipalities (Ellingsen et al., 2022; Hertzum et al., 2022). Furthermore, the transition toward increased information sharing among healthcare professionals takes place also via smaller projects characterized by bottom-up and user-driven processes. In these smaller projects, the adoption and scaling of EHRs are not mandated but rather happen through processes of gradual enrollment (Aanestad and Jensen, 2011; Dæhlen and Grisot, 2021; Grisot et al., 2014).

EHR implementation is a complex endeavor that challenges healthcare organizations. The challenges include seemingly mundane details such as user authentication (Bardram, 2005), grand-scale issues such as persistent user non-adoption (Aarts et al., 2004), and a host of problems related to organizing and running the implementation process. These process problems for example concern

ineffective user participation (Zahlsen et al., 2022), tensions between standardization and localization (Hanseth et al., 2006), errors in the interfaces for integrating the EHR with other health information systems (Viitanen et al., 2011), and cumbersome procedures for post-implementation improvements (Bansler, 2021). The broad scope of EHRs and their many user groups add to the complexity of the implementation process. As a result, the implementation of EHRs tends to be a lengthy and costly process with contracts for large-scale EHRs amounting to several hundred million euros (Hertzum et al., 2022).

The implementation of EHRs continues into their use. Healthcare professionals appropriate and otherwise respond to EHRs in their day-to-day use of them. For example, the comprehensive patient record in EHRs has been found to afford joint clinical decision-making based on shared data, but at the same time to constrain mutual understanding of those data because they are accessed through specialty-specific user interfaces and mostly communicated about through asynchronous messages (Vos et al., 2020). EHRs have also been associated with task drift (Tang et al., 2015), demands for increased levels of documentation (Zhang et al., 2022), increased documentation burden (Baumann et al., 2018), and expectations of improved possibilities for secondary use of the recorded data, for example for process improvement (Munoz-Gama et al., 2022). Contrary to intentions about reducing data fragmentation, EHRs have in some cases obstructed the building of a coherent patient history (Varpio et al., 2015) and necessitated workarounds to coordinate clinical workflows (Mörke et al., 2022). However, healthcare has become critically dependent on EHRs though paper records are still used to some extent and for some purposes (Cabitza et al., 2019).

In their review of the literature on health information systems (HIS), Sligo et al. (2017) conclude that “*Evaluating the implementation of HIS has been historically inadequate, plagued by simplistic and diverse approaches making it difficult to generalise the results.*” To understand EHR implementation, it is necessary to attend to the details of the individual cases, to the concepts applied in studying them, and to the questions that arise in comparing and contrasting different cases.

Aim

With this workshop, we aim to provide a forum for participants to get updated on current CSCW studies of EHR implementations and create connections with a select group of other researchers in CSCW (and beyond) who study such implementations. Three additional aims supplement this primary aim. By bringing the workshop participants together, we hope that cross-fertilization will ensue among their cases, their concepts, and their questions. Second, we will collaboratively reflect on what CSCW contributes to the study of EHR implementations 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 EHR implementation, for example the interest in a second workshop at the next ECSCW conference.

Workshop themes

The workshop is about implementing EHRs. Within this overall topic, the workshop themes include, but are not limited to, the following:

- Case analyses of empirical projects at different stages of completion – from preparations, through go-live, to continued use and design-in-use
- Theoretically oriented pieces that propose or refine concepts for understanding EHR implementation and begin to apply them
- Discussions that raise questions about important features of EHR implementations, such as their scope, clinical implications, and so forth
- Studies of the many stakeholder groups that are connected and reconnected by EHRs, including how these groups participate in EHR projects
- Methodological reflections on how to conduct studies, manage research data, and behave ethically amid clinicians, patients, and EHR vendors
- Comparative pieces that investigate similarities and differences across EHR implementations or between groups, sites, or stages in an implementation

Participant recruitment and selection

The workshop can accommodate a maximum of ten participants (in addition to the organizers). Participants will be recruited from the CSCW, health informatics, and information systems communities. 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. Detailed information about the workshop will be made available at 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. Position papers are limited to a maximum of six pages (excluding references) in the ECSCW paper format.

The submitted position papers will be reviewed by the organizers and accepted on the basis of the relevance and development of their content. If the number of people interested in attending the workshop exceeds its capacity, the organizers will prioritize submissions that make for rich presentations and discussions, while also seeking diversity among the participants. We specifically encourage both

junior and senior researchers to submit position papers. To promote broader participation, in particular from practitioners, we also offer the option of submitting alternative material of rough equivalence to a position paper (e.g., an experience report or abridged implementation plan).

Workshop activities

The workshop is a half-day event. It will consist of four activities:

- *Introductions*. The organizers introduce the workshop, including its aim and agenda. Participants introduce themselves and their interest in EHR implementation.
- *Paper presentations in similar-topic panels*. Participants will be grouped according to the topic of their position paper. Based on this grouping, all participants will give a short presentation followed by discussion. The grouping into similar-topic panels provides for cross-presentation issues to emerge.
- *Thematic discussions in break-out groups*. Participants will split into groups of about four people to explore the workshop themes further. Each group will be assigned different themes. The aim of these discussions is to delve deeper into issues from the presentations and to direct participants' attention to themes that may not have been prominent in the presentations.
- *Wrap-up*. To summarize the workshop, the break-out groups will give highlights from their discussions. The organizers will also probe the interest in a second workshop at the next ECSCW conference or in other ways of supporting further networking and collaboration.

Equipment needs

In addition to a room with wifi and projector, we will merely need flipchart-size paper and markers.

Organizers

The workshop is organized by four senior researchers who have investigated EHR implementations for decades and are currently involved in research projects about such implementations. The workshop organizers have a longstanding engagement with the CSCW community.

Morten Hertzum is professor of digital technology and welfare at Roskilde University, Denmark. His research interests are in CSCW, health informatics, human-computer interaction, information seeking, and organizational

implementation. He has been studying the implementation of information technology in healthcare for the past two decades. Currently, he is involved in projects about electronic medication management and the Norwegian implementation of EPIC's EHR.

Rebecca Randell is professor of digital innovations in healthcare at the University of Bradford and the Wolfson Centre for Applied Health Research. She has a background in human-computer interaction and her research sits at the intersection of health informatics and health services research. Recent work has included a realist review of the impact of inter-organizational EHRs on patient safety and a study of falls risk assessment and prevention in hospitals and how this is supported (or not) by EHRs.

Gunnar Ellingsen is professor in health sciences at UiT - The Arctic University of Norway, Department of Health and Care Sciences. Gunnar has for several years studied the implementation and use of large-scale Electronic Patient Records in Norwegian hospitals. Currently, he is engaged in the Norwegian implementation of EPIC's EHR, artificial intelligence in radiology practices, and electronic medication management. His research interests are in information systems, CSCW, and health informatics.

Miria Grisot is associate professor in Information Systems in the Digital Innovation group at the Department of Informatics, University of Oslo. Her research interests are in information systems, CSCW and health informatics with a focus on user organizations and user-driven approaches, information infrastructures and infrastructuring, collaborative design-in-use and continuous design. Currently she is involved in projects about the implementation and scaling of digital technologies for remote care in Norway and China, and about the development and design-in-use of inter-organizational infrastructures in primary care.

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Spatial tensions in CSCW: The political and ethical challenges of scale

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Abstract. This workshop advances a CSCW-perspective on how scale and place relate and how we might better understand what role scale plays in the design of tools and collaborative processes. This full-day workshop is designed for up to 20 participants, to be selected based on short position papers that relate to one or more of the workshop themes: (1) the political and ethical challenges of scale, (2) modes of organizing, infrastructuring, and governing, (3) (inter)organizational aspects, and (4) place and care. The workshop builds upon the COST Action *From Sharing to Caring: Examining Socio-Technical Aspects of the Collaborative Economy* that played a key role in bringing researchers together to address issues of care and scale, as well as recent workshops and interests groups at CSCW and HCI venues that have focused on issues of scale, cooperation, and place-making. Our aim with this workshop is to provide a space for the continued unfolding of the discussions sparked through these prior activities, this time with a particular focus on the political and ethical challenges of scale.

Introduction

This workshop advances a CSCW-perspective on how scale and place relate, place being a knowable, located and localized manifestation of space and scale being one possible measure of space, but one that brings the baggage of a birds-eye view to encounters. We are concerned to understand what role discourses and logics of scale play in the design of tools and collaborative processes, how they make and unmake place and how infrastructures that scale may be managed so that localized action and decision-making is still possible. In this, we are inspired by the nonscalability theory that Tsing (2012) has called for and begun to articulate.

When it comes to the study of the political and ethical challenges of scale in CSCW, recent scholarship highlights the timeliness of these issues: For example, in a piece in the *Interactions* magazine, Larsen-Ledet and colleagues (Larsen-Ledet et al., 2022) question *scale* as a metaphor and scaling as a process in addressing the sociotechnical. The authors argue that, as researchers and practitioners, we need to reshape our vocabulary, if we are to be serious about prioritizing social and ecological values like sustainability and equity. Elsewhere, we have written about *proliferation* as one alternative metaphor that can help us to reorient and enrich discussions on impact, ambitions, modes of organising, and the use of collaborative technologies (Lampinen et al., 2022). Proliferation, as we define it in our prior work, encompasses diverse ways of transforming and spreading, which acknowledge the importance of context and place.

Given its focus on local and location-oriented sharing and collaborative economies, our recent work (Light and Miskelly, 2019; Lampinen, 2021; Lampinen et al., 2022) has made us sensitive to the spatial tensions related – they are readily visible in this domain where venture-backed digital platforms, geared for maximal growth, co-exist with local and location-oriented initiatives. Yet, spatial tensions and the challenges related to scale are, of course, relevant to a much broader range of computer-supported cooperative activities. As one example, the work of Frauenberg and colleagues (Frauenberger et al., 2018) highlights scale, dialectics, and affect in participatory design, suggesting pathways to build bridges, foster alliances, and evolve participatory design practice to proliferate democratisation in technology design. The example of federated social media shows how architectural decisions and community practices can introduce notions of “place” and local ways of knowing in the governance and content moderation of systems otherwise dependent upon scalability, such as social networking sites. In such cases, federation not only allows for a diversity of political positions to act within the system (Mansoux and Roscam Abbing, 2020), but it also engenders useful concepts, such as the notion of subsidiarity (Rozenstein, ming; Hasinoff and Schneider, 2022), that can influence technology design towards community governance models.

This workshop builds upon the COST Action *From Sharing to Caring: Examining Socio-Technical Aspects of the Collaborative Economy* that played a key role in bringing researchers together to address issues of care and scale, as well

as recent workshops and interest groups at CSCW and HCI venues that have focused on issues of scale, cooperation, and place-making (Rossitto et al., 2020; Fedosov et al., 2019; Rossitto et al., 2017). Our aim with this workshop is to provide a space for the continued unfolding of the discussions sparked through these prior activities, this time with a particular focus on the political and ethical challenges of scale.

Workshop themes

The workshop considers spatial tensions in CSCW with the help of five broad themes. Participants are encouraged to articulate their interest in the workshop in connection to one or more of the following:

- **The political and ethical challenges of scale.** We look forward to contributions that examine and critique the role that notions of scale play in the design of tools and collaborative processes. Further, we encourage participants to explore how we might reshape our vocabulary to go beyond visions of scale and scaling as well as how infrastructures that scale might be managed so that localized action and decision-making remain possible.
- **Modes of organizing, infrastructuring, and governing.** We welcome contributions that advance and/or reflect on *different modes of organizing, infrastructuring, and governing* computer-supported cooperative activities and collectives. This can involve (but is not limited to) approaches such as federation, cooperatives, and localism in relation to platform-supported community organizing.
- **(Inter)organizational aspects.** When considering how grassroots initiatives and other computer-supported cooperative activities may proliferate and morph over time, issues of scale and long-term sustenance become entangled with questions of institutionalization, be it in the form of partnerships or formalizing the initiative/activity itself into a different type of an organization. Returning to a conversation started at CSCW 2020 (Rossitto et al., 2020), we see a number of open questions regarding engagement with and/or transformation into alternative organizational forms (public organizations, NGOs, cooperatives, etc.) so as to support the longer-term sustenance of (the aims of) grassroots initiatives. We invite participants to explore the processes and dynamics underlying such (inter)organizational transformation.
- **Place and care.** Two key threads that run through other workshop concerns are the notions of *place* and *care*. Here, we are particularly interested in contributions that address the importance of *spatial* and *care-ful* considerations in computer-supported cooperative activity and how these may come into tension – or even outright conflict – with the logic of scaling. We welcome contributions that illustrate the localized work, partnerships,

processes, and ecological relations whereby care for place is fostered and accomplished (see, for instance, Rossitto et al. (2022)).

- **Theoretical frameworks.** We encourage authors to discuss theoretical aspects that reflect both the ethics of place and the ethics of care. We are interested in the analytical relevance of these approaches, as well as their generative value in designing and assessing the role of digital technology in fostering bounded spaces of our imagining and making.

Workshop goals

The goals for this workshop include:

- Bring together researchers within (and where possible beyond) the CSCW community with an interest in the problematics of scale, with the aim of sharing ongoing research and connecting participants with others who share their research interests.
- Reflect collectively on what a CSCW perspective can contribute to the study of different modes of organizing, infrastructuring, and governing.
- Articulate future research agendas and questions that foreground the ethical and political questions of scale.
- Facilitate in-depth conversations about research during the event, while also seeking to support and scaffold collaborative efforts that exceed the short duration of the workshop.
- Discuss how participants could (and already do) collaborate not just with other researchers but also with practitioners, civic servants, journalists, and other relevant stakeholders.
- Facilitate the formation of this sub-community in CSCW and HCI, and discuss possibilities for a lightweight collaborative infrastructure to sustain it (e.g., a listserv or a wiki page for resources).

Workshop 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:

- **Introductions.** The organisers will open the workshop by introducing the agenda and goals for the day. They will then facilitate a round of meet-and-greet, giving each participant a moment to introduce themselves and their interest in the topic.
- **Panel discussions.** The participants will be organised in thematic panels based on their position papers. Everyone will give a 6-minute presentation, followed by a collective discussion. The organisers will take shared notes to generate material to be worked on collaboratively.

- **Walk-and-Talk in Break-Out Groups.** Participants will split into groups of 3-4 people to further explore shared interests. The recommendation is to discuss while taking a walk, if that is feasible and desirable to everyone in the group. For this activity, groups will be encouraged to focus their conversation in particular on methodological issues. The goal is to identify key ideas and questions for discussion.
- **Summarising.** 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 so as to listen and respond to each others' thoughts.
- **Next Steps and Closing.** The workshop will conclude with a shorter discussion around possible next steps to advance CSCW research around the political and ethical challenges of scale, and to consider opportunities for further collaboration.

Participant recruitment and selection

The workshop is planned for a maximum of 20 participants (including the organisers). Participants will be recruited from the CSCW and CHI communities, and from the extended research networks of the organisers. Detailed information about the workshop will be made available at our workshop website. We will reach out to international, interdisciplinary networks by circulating the call on relevant listservs (EUSSET, AoIR, etc.) and through social media.

Those interested in the workshop will be invited to submit a short position paper (or equivalent material) that addresses the workshop themes. We encourage potential participants to discuss their interest in the themes, welcoming reports of (preliminary) empirical results, theoretically oriented pieces, as well as methodological reflections. To promote broader participation, in particular from the industry and civic organizations, we offer the option of submitting alternative material of rough equivalence (e.g., a design portfolio, white paper, or similar). Submissions will be reviewed by the organisers and accepted based on the relevance and development of their chosen topic, as well as participants' potential to contribute to the workshop.

Equipment needs

The workshop has no equipment needs beyond the usual: a room to host the event, wireless network connectivity, and a projector. Some supplies for group work, such as post-it notes, flipboard-sized paper, and pens, would be helpful.

Organisers

The workshop is organised by a group of scholars with a strong track record of working on topics of scale and care, along with a longstanding engagement with the CSCW community:

Airi Lampinen studies interpersonal and economic encounters, peer-to-peer exchange, and algorithmic systems. Her recent book *The Trouble With Sharing* addresses the interpersonal challenges inherent in peer-to-peer exchange. Lampinen is an Associate Professor in Human–Computer Interaction at Stockholm University, Sweden, and a Docent in Social Psychology at the University of Helsinki, Finland. Currently, Lampinen is the co-PI of the WASP-HS project *Ethics as Enacted through Movement – Shaping and Being Shaped by Autonomous Systems*. She is also part of the Digital Futures faculty and co-leads two projects within the centre: *Layering Trust in Intimate Digital Health Technologies* and *the Digital Futures Drone Arena*.

Ann Light is focused on the politics, ethics and agency of design, and especially co-design in communities, exploring social activism at neighbourhood level, investigating the design of sharing structures and questioning the boundaries of participation. She is Professor of Design and Creative Technology, University of Sussex, UK, and Professor at Malmö University, Sweden. Regarding the social and ecological as inextricably linked, Light has turned to consider the stress that current systems put on the planet, believing creative remaking of relations is needed for liveable futures. She is co-creator of the CreaTures Framework, prepared as part of the European Union project Creative Practices for Transformative Futures (CreaTures: <https://creatures-eu.org/>).

Chiara Rossitto is Associate Professor of Human-Computer Interaction at Stockholm University, Sweden, and Visiting Professor at the Centre for Sustainable and Digital Transformation, at Aalborg University. She has extensively investigated the role of digital technologies in fostering care, civic engagement, and people's participation in initiatives seeking more sustainable futures. Her research has investigated the use of digital technology to support and structure environmental stewardship and care for the environment, waste management practices, and political dialogues. Moreover, it has problematised scale as the only notion often associated with technological development and the long-term impact of technological interventions aiming at social change.

Roel Roscam Abbing is a doctoral candidate of Interaction Design at Malmö University's School of Arts and Communication. Through a combination of software studies and participatory design approaches, his research focuses on the design of federated social media.

Anton Fedosov is a postdoctoral researcher at the People and Computing Lab at the University of Zurich in Switzerland. His research interests lie at the intersection of social aspects of ubiquitous computing, collaborative economy, and user experience design of interactive systems and services. He holds a PhD in Informatics (with a focus on design-oriented Human-Computer Interaction) from

USI Lugano in Switzerland. He is a Swiss Management Committee Member in an interdisciplinary pan-European research network, COST Action 21118 Platform Work Inclusion Living Lab, investigating socio-technical aspects and alternative design models of the platform economy.

Luigina Ciolfi is Professor of Human Computer Interaction in the School of Applied Psychology at University College Cork, Ireland. She is a member of the People and Technology Research Group. She studies human experiences and practices around digital technologies through a practice-focused approach and adopting participatory and co-design methodologies. She is currently involved in a collaborative project exploring Responsibility in software and systems design and development funded by Lero - The Science Foundation Ireland Research Centre for Software.

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Claus Bossen; Christophe Chassot; Caroline Datchary; Sylvie Grosjean; Shion Guha; Myriam Lewkowicz; Samir Medjiah; (2023): Collectively Improve the Quality of Life at Work: How and Which Data to Collect and Analyze? In: Proceedings of the 21st European Conference on Computer-Supported Cooperative Work: The International Venue on Practice-centred Computing on the Design of Cooperation Technologies - Workshops, Reports of the European Society for Socially Embedded Technologies (ISSN 2510-2591), DOI: 10.48340/ecscw2023_ws03

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Collectively Improve the Quality of Life at Work: How and Which Data to Collect and Analyze?

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Abstract. Digitization of work has expanded the possibility to collect traces of activities, and AI techniques now extend the potential for analyzing this large amount of data. This phenomenon is mostly associated with forms of control and evaluation of the activity of the employees, thus generating forms of resistance. It is therefore important to think about forms of collection and processing of this data that could improve quality of life at work, by tackling information, cognitive, or communication overload. Indeed, this data could be used to improve deliberation in organizations, by providing digital representations of the activity, which is not easy to grasp in day-to-day professional work. The objective of this workshop is to gather researchers interested in discussing how data could be collected, analyzed, and discussed to improve the quality of life at work: which data? Which methods for its collection and its analysis? Under which conditions?

Detailed proposal

All kinds of organizations (public or private, bureaucracies or start-ups) increasingly trace work or activity of their members, under the guise of diverse objectives; either supporting productivity, security, or resilience (Meijer et al., 2021; Flyverbom & Murray, 2018). Data can be collected both manually or automatically through the usage of the different devices and IT systems that equip the work or the activity. These traces (of the use of an application, of the access and edition of data) are often used to inform metrics, or to produce analytics (like activity dashboards), that are increasingly sophisticated, and therefore also support more and more granular ways of monitoring, evaluating, and improving business processes, as well as assessing employees' productivity.

If the digitization of work has expanded the possibility to collect traces of activities, AI techniques now extend the potential for analyzing this large amount of data. However, it remains difficult to make sense of the data that is collected and analyzed by this AI. As (Koesten et al. 2021) say: "while sensemaking of textual information has been well-explored, there is a relative gap in research that aims to understand the strategies involved in making sense of data". Indeed, human work is needed to tune algorithms, and to be able to integrate AI into real-world systems (Fiebrink & Gillies, 2018), which finally ends up increasing the cognitive overload of the workers.

What is often highlighted is the harm that these techniques to collect and analyze data at work can cause to the workers. For instance, Levy (2022) has explored how technology (sensors, cameras, GPS systems, and on-board computers) is increasingly used to monitor truck drivers in the United States. She shows how the various surveillance technologies that are used to monitor and measure drivers' performance further reduce their autonomy and increase the risk of penalties for minor errors.

However, these issues could be addressed in another way; in a context where organizations will increasingly use AI, one can indeed discuss how and under which conditions the collection and the analysis of data (traces of the activity of workers) could be rather used to improve the quality of life at work (QLW), in particular by reducing their information, cognitive, and communication overload (Cicourel, 2004; Mark, 2003; Wilson, 2001).

Actually, in a context where the development of AI increases the processing capacities of this data tenfold, it is urgent to consider uses that are not only related

to control and a logic of increased performance, but also daily uses that make data meaningful and interpretable by reducing uncertainty, equivocality and supporting organizing processes (Weick, 1995). We still know very little about how users interpret usage data in real work settings; what concerns, or hopes, and forms of trust their place with usage data entail, and how these are used to support daily practices at work. We need to examine usage data in mundane everyday working to understand how people experience working with usage data, and how in proceeding through their daily activities they take advantage of data to support collective processes (Pink et al., 2017). This involves specific methods to understand how people work on and with usage data (e.g. Kristiansen et al 2018). It is indeed important to look at how AI reconfigures work practices by producing analytics, not only looking at the technology's potential capacity, but also on the labor of integration that humans must accomplish to correct errors or to allow a better integration of the technologies in their workplace practices (Mateescu & Elish, 2019). Employees must indeed interact, collaborate with, and integrate data and their analysis generated by AI systems into their work activities (Faraj et al., 2018; Jarrahi, 2018). In other words, to successfully integrate AI into the organization (not harming the workers), we need to consider not only its technical aspects, but also the human ("human infrastructure", Mateescu & Elish, 2019) and social aspects ("social interoperability", Grosjean, 2019 and "data valences", Fiore-Gartland & Neff, 2015). It is time to explore in more detail the synergies, the forms of collaboration that can take place between human workers and AI in the workplace (Seeber et al., 2020; Flygge et al 2021, Saxena et al 2021)), and then to incorporate this knowledge into the design of socio-technical systems that support the visualization and the analysis of data collected at work (Makatius et al., 2020; Bader & Kaiser, 2019), and therefore help collectively making decisions on how to evolve for a better QLW (Paschkewitz & Patt, 2020).

The question is then also to discuss how workers can negotiate the collection and the analysis of data, and how they can use this collected and analyzed data to reflect on their activity, both at the individual and the collective levels. These reflections could lead to collectively defining norms for QLW. We can envision that there is a heterogeneity of the employees' representations of the practices they consider problematic regarding QLW. In this context, how could communication conventions be developed within an organization and how could this collective elaboration be supported? This last question raises the issue of participatory designing systems for collecting, analyzing, and reflecting upon data at work, which is related to the conditions of appropriation of AI-based technologies: Does the possibility of "seeing in action" and revising the collection and the analysis could contribute to the transparency and the appropriation of these technological opportunities?

In this context, several questions can be raised:

1. How can data be collected at work, ensuring transparency for the workers, and the respect of local regulations (like the GDPR law in Europe)?

2. Which work needs to be done on the collected data at work? How to protect data, how to define which gets access to which data? What are the organizational and political stakes related to these issues?
3. How can we design AI systems producing useful and meaningful data that can support people mundane everyday working activities?
4. What do people need to know about an AI system to be able to work with usage data?
5. How AI systems convey usage data to its users in a meaningful and understandable manner?
6. How can the data generated by an AI system contribute to reducing equivocality and uncertainty and thus support sensemaking and collective decision-making processes?
7. How could the workers appropriate data and their analyses to improve their quality of life at work (QLW)? How could they collectively define norms for QLW, and which data and systems could support these negotiations?

Description of themes (non-exhaustive list)

In order to address the questions listed above, we are looking for contributions on the following themes, but not limited to:

- Empirical studies about forms of data collection at work, the use of metrics in the workplace, debates about the collection of data, the collective formation of norms, forms of resistance, bypasses, workarounds, ...
- Methodological challenges and innovative methodologies for the collection and analysis of data at work
- Conceptualization of different forms of agency , trust ...
- Participatory designs of software/AI systems to collect data, analyze it, visualize the analyses, discuss them, collectively define usage norms
- IT systems/algorithms programming the infrastructure to implement usage norms

The themes listed above can be addressed regardless of the type of work being considered. We are especially interested in reflections and testimonies (positive or negative experience with such data use) upon data collection for workplace democracy, but also for improving quality of working life.

Activities

Maximum number of participants : 15

Length of the workshop: 1 day

The workshop is planned as a full-day event divided into two sessions and will involve additional online activities organized both before and after the workshop. The contributions will be made available on the workshop website in order to prepare the attendees for discussions at the workshop. Beyond the themes highlighted here by the workshop organizers, other themes for the workshop emerging from the position papers will be posted on the website. We will ask participants to reflect on these themes. Depending on the scope and focus of the contributions, we will consider proposing a few guiding questions.

The first half of the workshop would be devoted to the brief presentations of participants' research. In order to stimulate the exchanges, each selected proposal will be assigned to a discussant who will have to provide a brief summary of the short paper's main topic and its contribution to the workshop, talk about the submitted short paper and raise questions to the author(s) during the workshop. The author(s) will be able to answer the questions by sharing empirical material or results, by explaining conceptual framework or by developing on methodological choices. The second half of the workshop will consist of collective development of a synthesis upon identified themes with a review of the literature. The group would be first divided then gathered for a final restitution.

Equipment needed

- projector
- paper board, ideally with markers and post-it notes

Means of recruiting and selecting participants

Participants will be recruited through:

- EUSSET mailing list
- CSCW mailing list
- Announcements on social network
- International Communication Association mailing list
- International Sociological Association mailing list
- Professional network of the organizers

A workshop website will be created and updated until the closing of the workshop. Participants will be selected based on their position paper submissions (up to 4 pages in length using the ECSCW Exploratory paper format). The selection will be made by the workshops' organizers on the basis of their interest, compliance with the workshop themes, and the extent (and diversity) of their backgrounds.

Goals

In this workshop, we wish to bring together researchers interested in these topics in a context of development of the use of AI for the analysis of these data at work and to make a first inventory of the useful literature to be mobilized for this emerging research field

Depending on the outcome of the workshop's discussions and on the interest of the participants, we may explore further publication outlets for the workshop papers. We were in particular thinking of a special issue of the CSCW Journal.

Background of the organizers

- **Claus Bossen** is professor at Aarhus University, Department of Digital Design and Information Studies. His current interests focus on the data work that accompanies datafication processes with a specific focus on the healthcare domain. Data work is often rendered invisible by the assumption that data is generated and processed automatically, even though datafication entails new tasks and even new occupations. More generally, his research pivots around ethnographic studies of work, IT and organizations analyzing the design, development, implementation, and use of IT systems. His research fields included CSCW, Participatory Design, Medical Informatics Critical Data Studies, and Science-Technology-Studies.
- **Christophe Chassot** is full professor in computer science and networks at the INSA Toulouse (France), where he is director of research and development. His research activities focus on next-generation communication networks and systems, and their applications. His contributions deal with dynamic and autonomous reconfiguration of new communication architectures taking advantage of recent opportunities in network softwarization and virtualization.
- **Caroline Datchary** is full professor of sociology at Toulouse Jean Jaurès University (France) where she is deputy director of the LISST research laboratory. She is interested in situations of dispersion at work with a view to improving working conditions. Her research fields concern various work situations and combine different methodological approaches.
- **Shion Guha** is an Assistant Professor in the Faculty of Information and Department of Computer Science at the University of Toronto where he directs the Human-Centered

Data Science Lab. He is interested in how street level bureaucrats and social workers make decisions from AI algorithms in high stakes decision-making environments such as in child welfare, healthcare, or homelessness. He often combines computational, technical methodologies with critical, interpretive approaches.

- **Sylvie Grosjean (Ph.D.)** is full professor at the University of Ottawa and the chair of the Com&Tech Innovations Lab (<http://ctilab.ca>). Her current research interests include the design and implementation of telehealth innovations as well organizational communication by studying the role of technologies (e.g. Medical Information Systems, telemedicine technologies) on care coordination and clinical decision-making. She develops a codesign approach in health and uses various qualitative methods to analyze human/machine interactions (e.g. video-ethnography).
- **Myriam Lewkowicz** is Professor at Troyes University of Technology where she heads the pluridisciplinary research group Tech-CICO and the master program. She is interested in defining digital technologies to support existing collective practices or to design new collective activities. This interdisciplinary research proposes reflections and approaches for the analysis and the design of new products and services to support cooperative work. The main application domains for this research for the last fifteen years have been healthcare (social support, coordination, telemedicine) and the industry (digital transformation, maintenance). She is a member of the program committees of the main conferences in Cooperative Work, Social Software, and Human-Machine Interaction, chairs the European scientific association EUSSET, and is deputy editor-in-chief of the CSCW journal, « The Journal of Collaborative Computing and Work Practices ».
- **Samir Medjiah (Ph.D.)** is associate professor in computer systems and networks at Paul Sabatier University - Toulouse III (France) and a researcher in LAAS-CNRS. His main research interests include overlay networks optimization, network virtualization, and software defined networking. He has worked on various R&D projects related to application-driven networking and Network-Application co-optimization.

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The digital public encounter

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Abstract. The digitalization of the public sector impacts nearly all aspects of public service provision, including the interaction between citizens and public officials, also known as public encounter. This traditionally face-to-face interaction is being replaced by digital platforms, chat-bots, and self-services. Public encounters can be highly collaborative processes, e.g. in the provision of welfare services, that involve multiple stakeholders. The use of digital tools in these processes poses opportunities as well as challenges to the collaborative process and the public service provision in general. This workshop aims to bring together researchers and practitioners with a common interest in the collaborative aspects of digital public encounter, how public officials and citizens communicate and cooperate through digital tools, and the long-term impact of these technological transformations. Topics include but are not limited to communication and collaboration processes in the digital public encounter, analysis of digital tools in the public encounter and theories and case-studies on how public encounters happen. We invite researchers as well as practitioners to participate in the workshop.

Theme of the Workshop

Digital technology such as self-services and automatization have become an integral part in nearly all societal aspects, from healthcare to education and banking to traveling. While the digital tools applied vary from field to field, all of them have in common that they alter or completely replace human-to-human interactions (Hassani et al., 2021; Sætra & Fosch-Villaronga, 2021). Yet, research on the societal impacts of digitalisation is still scarce (see for example (Alsos et al., 2012; Brands & van Doorn, 2020; Sharma et al., 2021)).

Digitalisation also takes place in the public sector and becomes most visible in the digitalisation of public service provision. The application of digital tools and the accompanying organisational and social changes are described under the term digital government (Alshehri & Drew, 2010; Haveri & Anttiroiko, 2021). Digital government is meant to increase well-being, democratic values, transparency, participation, and accountability (OECD, 2003; Twizeyimana & Andersson, 2019; Worldbank, 2015).

One important aspect that has received little attention in the digital government literature is the interaction or contact between public officials or the state and citizens – also known as *public encounter* – and how this encounter is altered by digitalisation. The public encounter includes citizen-state interaction within the context of public service provision as well as interactions such as voting, lobbying, and asking citizens for advice (Lindgren et al., 2019). Traditionally, the term public encounter described the face-to-face contact in a physical environment (Bartels, 2013). The introduction of digital tools in public government services has shifted the public encounter away from face-to-face contact into digital environments, such as websites and mobile applications. While public service provision mostly makes use of webpages, digital platforms, and chatbots, other areas such as citizen participation in urban planning processes apply 3D-models (static, animated or virtual reality models), communication platforms, and computer games to facilitate citizen interaction (Hanzl, 2007). Virtual and augmented reality are also being tested for collaboration and meeting situations. These digital applications open up new opportunities but also challenges in the collaboration between citizens and public officials.

From a CSCW perspective public encounter can be regarded as a collaborative practice involving citizens and government officials. In our view public encounter makes for an interesting case for CSCW researchers as it is an example of practices that cross organizational boundaries and involved multiple stakeholders. Earlier CSCW literature has investigated these “boundary practices” in healthcare services (Gui et al., 2018), home-based care services (Procter et al., 2014), online labour platforms and crowdwork (Martin et al., 2014) etc. Our workshop proposal aims to build on this line of CSCW research and it can in this way be seen as an attempt to

build empirical evidence and theory about multi-stakeholder and boundary practices.

From a digital government perspective, and utilizing a government-as-a-platform view, the public encounter can be described with the boundary resources model developed by (Ghazawneh & Henfridsson, 2013). Boundary resources are defined as “the software tools that serve as the interface for the arm’s-length relationship between the platform owner and the application developer” (Ghazawneh & Henfridsson, 2013). (Gong & Li, 2023) have adapted this model to define e-government platforms where boundary resources “enable and stimulate collaboration among government agencies”. Thus, the boundary resource model can also be used to define the interface for the relationship between citizens and public officials. These boundary resources ought to be designed to enable collaboration.

While the public encounter in political discourse and citizen engagement has been subject to CSCW literature (Kou et al., 2017; Saldivar et al., 2019; Weise et al., 2017), the public encounter within the public service provision has received little attention in the CSCW literature. The complexity of the public encounter poses a number of challenges to the deployed digital tools to enable high quality service delivery.

Borchorst et al. (2012) identified an digital tool’ rigidity as challenge to collaboration between case workers and citizens as well as to the citizens ability to perform an identity that is compatible with the bureaucratic administrative processes. Döring (2019) identifies three different perspectives of the public encounter. (1) a transaction perspective where the exchange of information and imposed transaction costs are in focus, (2) a social interaction perspective where the public encounter is characterized by a power asymmetry between the public official and the client, as well as social norms and processes, and (3) a service interaction perspective where citizens are understood as customers and service delivery is at the centre. This service failure and service recovery become important aspects of the public encounter (Döring, 2019). This diversity in perspectives and therefore expectations towards an interaction and collaboration process needs to be considered when designing digital tools to support this interaction.

Further is the nature of the public encounter influenced by changing the when, where, and how of the interaction as well as what each actor does and the skills that are required to perform the task (Lindgren et al., 2019). The shift from physical to digital public encounter introduces such a change.

Through this workshop we want to investigate how digital public encounters are experienced by the different actors and the challenges but also benefits connected to a digital interaction. Sharing and collecting first- and second-hand experiences from researchers as well as practitioners will help participants to gain a wider

understanding of the deployment of different digital tools in public encounters and the effects on communication and collaboration processes.

Workshop topics include but are not limited to the following:

- The traditional view of public encounter, i.e. client – case-worker communication and collaboration in digital public service provision.
- More complex boundary practices in public services involving multiple stakeholders.
- Analysis of digital boundary resources such as chatbots, AI, virtual reality, and call centers in the implementation of the public encounter.
- Exploring new interaction arenas – including hybrid physical-digital meeting spaces.
- Theories and case studies about how public encounter happens.
- Application of multidisciplinary to public encounters.

Workshop activities and goals

Our goal is to bring together researchers and practitioners with a common interest in the digital public encounter, how public officials and citizens communicate and cooperate through digital tools, and the long-term impact of these technological transformations. Each participant will have 10 minutes to present their work which will be followed by a 20 minute discussion. The discussion will be led by a discussant.

Duration of the Workshop

We plan to organize a half-day workshop. The workshop will include short presentations from each participants, followed by discussions.

Workshop organizers

Michaela Schmidt is a PhD candidate at the Department for Computer Science at the Norwegian University of Science and Technology (NTNU). Her research interest concerns the impact of digitalisation on society and on the societal aspects of sustainability.

Babak Farshchian is an associate professor at the Norwegian University of Science and Technology. Babak's interests include sociotechnical practice studies, public sector, healthcare and social services, and digital transformation.

Sara Hofmann is an associate professor at the Department of Information Systems at the University of Agder. In her research, she has focused on the interaction between citizens and public sector organizations and how this has been altered by digitalization. Currently she is leading two research projects that analyze what public services should be digitalized.

Maximum number of participants expected

We expect 10-15 participants.

Means of recruiting and selecting participants

We will prepare a call for papers that will be distributed through mailing lists and social media. We might also invite researchers and practitioners directly.

We will have a selection process and participants who submit position papers of 2-4 pages will be prioritized. The submission deadline will be 1. May 2023. A web page for the workshop will be available under the following link:

- <https://digipub.idi.ntnu.no/digital-public-encounters/>

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Experimenting with Ethnography: Making Time-Space for Analysis

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Abstract. In this master class you will experiment with the concept ‘object exchange’ as described and developed in (Korsby & Stavrianakis, 2021). As preparation you will bring an object from your field of study. It can be anything from your field, an image, a recorded sound bite, a diary, a transcript, but also a smell or. as long as it has a physical form. Prior to the workshop you must also read the Introduction to Experimenting with Ethnography: A companion to analysis (2021) Analysis as Experimental Practice. (Ballesterio & Winthereik, 2021: 1-14) and Object Exchange (Korsby & Stavrianakis, 2021: 82-93).

Contextualization

The class introduces the concept of ethnographic analysis as an experimental practice. By offering the participants the opportunity to themselves use one analytic protocol, the aim of the class is to inspire for opening a new, collaborative path in your analysis. Rather than approaching analysis as an abstract and solely intellectual practice, the aim of the class is to work through a

protocol to convey a concrete mode of action and creative practice for researchers. An important point of departure for the class which draws on Korsby and Stavrianakis (2021) and the introduction from the same book is problematizing that a fixed boundary between “the field” (data collection) and “the desk” (analysis, theorizing) exists or is automatically meaningful. The concept of the analytical protocol links to the history of experimental settings as a site of interest in the social sciences and humanities (Rheinberger 1997; Latour 1999). The class invites participants to engage with questions such as:

- How are we confined by traditional ways of thinking about analysis in approaching our own data
- How do experimental approaches to analysis inform the production of knowledge, the treatment of data, as well as the empirical sites we enter?
- How can we as researchers nurture a space of play opening up ways of experimental thinking
- What new insights about our data and our object of study can we achieve by applying concrete protocols with method for experimentation?

Goals and Activities

During the master class the participants will exchange objects from their field work and engage in description and analysis of somebody else’s materials. The participants will also make their own analytic protocols fit for the challenges they have met during their studies. The goal of the master class is to exercise working from the data to the structure and reflect on the systematics of the approach.

Target Group

The masterclass is intended for both PhD and master students who conduct ethnographic fieldwork as part of their data collection. Students who work in cross disciplinary settings can especially benefit, but the class is open to anyone who are working on CSCW, HCI, STS, anthropology, sociology and who have experience with ethnographic fieldwork. Preparation is required.

Format and Duration

The masterclass is planned and prepared as an in-person event in Trondheim. The masterclass will be held on 6th of June, 2023 as a half-day event from 9:00 to 13:00.

Number of Participants

To make it viable to assist the participants properly in all the activities, a maximum of 10 participants will be accepted. To apply for the master class, participants will be required to send a one-page description of their project, including project title and their motivation for participation to Brit Ross Winthereik.

Required Resources

For the Masterclass, a flat room (not lecture hall) with enough workstations (tables and chairs) for the specified number of participants is sufficient. The room should have a projector, sound system, and flipchart and multi- color flipchart makers.

Organizer's Short Bio

Brit Ross Winthereik is professor of human-centered digitalization in the Division for Responsible Innovation & Design at the Dept. of Technology, Management and Economics, Technical University of Denmark (DTU). Her research revolves around digitalization processes and the use of data in the public sector of contemporary welfare societies with a particular focus on information infrastructures and human life within. She has published within STS, anthropology and information systems. She is co-author of 'Monitoring Movements in Development Aid: Recursive Infrastructures and Partnerships' (MIT Press, 2013) with Casper Bruun Jensen, co-editor of 'Electrifying Anthropology: Exploring Electrical Practices and Infrastructures' (Bloomsbury, 2019) with Simone Abram and Thomas Yarrow, 'Experimenting with Ethnography: A Companion to Analysis' (Duke University Press, 2021) with Andrea Ballesterio, 'Handbook for the Anthropology of Technology' (Palgrave Handbook Series, 2021) with Maja Høyer Bruun et al, 'Energy Worlds in Experiment' with Laura Watts and James Maguire (Mattering Press, 2021), and 'Aktørnetværksteori i praksis with Irina Papazu (Djøf forlag, 2021).

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