Privacy in Collaborative Work - A Situated Challenge

Ida Larsen-Ledet
Department of Computer
Science, Aarhus University
Åbogade 34, 8200 Aarhus N,
Denmark
ida.ll@cs.au.dk

Abstract

In this position paper for the workshop *"Moving beyond a 'one-size fits all' approach: Exploring Individual Differences in Privacy"* I present a discussion of the role of privacy in collaborative settings. Employing Gavison's understanding of privacy as the limitation of access to the individual along with Dourish and Anderson's notion of information practices, I argue that the situated and enacted nature of privacy poses a challenge to technological capabilities. I present a suggestion for a theoretical framing of collaborative privacy based on Bardram's three levels of collaborative activity in combination with Fauconnier and Turner's theory of conceptual blending.

Author Keywords

Privacy; information practice; presentation of self; conceptual blending; collaborative work; collaborative activity; collaborative writing; contexts of use

ACM Classification Keywords

H.5.3 [Information interfaces and presentation (e.g., HCI)]: Group and Organization Interfaces—collaborative computing, computer-supported collaborative work, theory and models, web-based interaction; General terms []: Design, Human Factors

Introduction

People's interactions with technology are shaped by individual differences, and few "one-size fits all" solutions manage to "fit" all types of users. But "one-size fits all" approaches are not only flawed when it comes to accommodating different users: different constellations of users and objectives also pose a challenge. In the case of for instance computer-supported cooperative work, contextual needs arise due to varying purposes, situations, and participants. Privacy preferences vary between individuals, and they depend on the object and the context of the work, including who else is participating and relations to these other participants.

In this position paper, I discuss privacy challenges faced by users in collaborative settings, as well as the challenge of embracing human practices with technological means. I also present methodological considerations for understanding privacy concerns in collaborative settings, in an effort towards better ways of addressing situated practice and context-dependent privacy needs.

Collaboration and Privacy

Collaboration necessarily involves sharing of thoughts, resources, etc. There are inherent trade-offs in this sharing, such as the benefits of contributing by sharing one's work versus potentially having to receive criticism of this work [1]. Although the work contributed might not be considered private in itself, people will be concerned with whether and when to make it available to others, and which people to make it available to. This is a privacy concern no matter the nature of the information that is potentially being made available, according to Gavison's definition of privacy as the limitation of an individual's accessibility to others [6].

According to Gavison, creative work requires privacy because it shields the person from judgment and unpleasant responses at the early stages of the creative process. This is part of maintaining certain relations with collaborators. Keeping things private and managing disclosure enable people to establish a presentation of themselves that suit their understanding of the current situation [6, 1, 4]. Regulating the self is a natural part of engaging in social activities [6].

Distributed collaboration

Many instant messaging applications display information about users' online status, and in many cases also the time of the latest login, whether the last message has been read, and whether the user is currently typing something for the viewer. Some users find this dissemination of information invasive and attempt to circumvent it using various strategies [9, 3]. Similar concerns are likely to arise in tools for distributed collaboration, such as Google Docs[1] and ShareLaTeX[2] where chat features and logs are available to users. These kinds of features facilitate users' access to each other's current and past activies, enabling a high level of attention to the individual. Even if they are never utilized, those features may affect the experience of privacy that participants in collaborative settings have: the chance that someone else could see previous versions of an individual's work, from before it was complete, restricts that individual's feeling of privacy while working [6, 4].

In a study of territoriality among Wikipedia editors, Thom-Santelli et al. describe article managers revising Wikipedia articles offline and not uploading the finished product until it is complete [11]. In this way they are applying a strategy for achieving privacy during their work, in spite of the Wikipedia platform not supporting this kind of privacy to the desired extent.

---

[1] docs.google.com
[2] sharelatex.com

Situated Collaborative Privacy

The Wikipedia editors' strategy is an example of performative information practice, as described by Dourish and Anderson [4]. In their interpretation, privacy is socially and culturally embedded and determined. What is currently private, such as a draft for part of a collaborative writing project, may at a later point in time no longer be considered private, such as when the draft is polished enough that the author desires for it to become public and part of the collaborative piece of work. These changing needs for privacy are managed through practical action in specific contexts, without need for being articulated.

The problem of automating practice
Solutions which attempt to make information practices explicit will fail to adequately capture the situated nature of those practices. One such example is a solution proposed by Hawkey and Inkpen [8]. They suggest an approach based on users tagging visited websites with one of several pre-defined privacy levels, enabling semi-automated control over the display of incidental information.

Automation is problematic because although information practices as social processes are (to some extent) unconscious and thus could be viewed as automatic, their enactment is grounded in a unique context. An automated solution would remove from users the ability to flexibly enact information practices. Furthermore, automated action would not be based on the current, unique situation, but on previous situations.

Rigid requirements for explicit classification make systems insensitive to unspoken practices [7]. Solutions are needed that allow people to transition seamlessly between situations requiring different levels and kinds of privacy, without having to articulate an information practice that is inherently tacit.

A Theoretical Foundation for Understanding Privacy in Collaborative Work

Much can be learned from studying transitions between private and public states of digital objects as they change with people's activities and interactions. In this repsect, I find Bardram's three-level hierarchical structure of collaborative activity to be useful [2]. Drawing on work by Engeström, Fichtner, and Raeithel, he identifies the following three levels of collaborative activity:

- Coordinated activity

- Cooperative activity

- Co-constructive activity

The levels reflect the stability of the object of the collaborative work, as well as the means applied towards that object such as tools and division of roles. All three levels can be used as an analytical framing of the same collaborative activity.

The relationships between the three levels are dynamic and evolve through transformations between the levels. Transformations happen due to breakdowns, shifts of focus, and resolving of contradictions and problems. They consist of processes such as routinization of actions and reflection on the object of work.

I find that it is possible to reach a better understanding of transitions between private and public states of digital objects by relating them to transformations between levels of collaborative activity. The time when a participant starts viewing the privacy of a piece of work differently is also a point of transformation of the collaborative activity: the participant's objective changes as she must for instance make

changes based on feedback, incorporate her contribution into into the collaborative product, or start on a new sub-task. The groups' objective is altered as other participants must, for example, respond to her contribution in respect to their own work as well as the overall object of work. Similarly, means of work will change as the participant alters her way of working to match her perceived level of privacy. Changes to the objective will likewise effect changes to the means of work, for all participants. And transformations can likewise effect transitions, in a bidirectional relationship.

The breakdowns, contradictions, and focus shifts underlying transitions between levels of collaboration — and consequently between states of privacy — can be described as violations of governing principles in conceptual blends, a notion conceived by Fauconnier and Turner. Conceptual blends are the results of mappings between various spaces of knowledge involved in understanding and reasoning about situations, concepts, etc. [5]. In making sense of conceptual blends and using them to reason about the world, people rely on a set of *governing principles* for relations arising in the blend. Violations of these principles can result in conceptual blends that are hard to make sense of.

Using the notion of conceptual blends, transformations can be described as resulting from instability in the conceptual blend: when a shift of focus occurs, new input spaces are included while others may be removed, causing relations in the conceptual blend to become unstable. This can potentially mean violations of governing principles, leading to a transformation of the activity. Breakdowns and contradictions cause similar instability in the conceptual blend.

Future work
The above perspective illuminates the relation between privacy management and collaborative work, and it opens up for questions about how acts of privacy regulation affect the collaborative workflow. Answers to these questions can inform the design of technologies that are used in collaborative work, in order to support design for flexible privacy management. I emphasize the design of collaborative technologies, as opposed to the design of privacy interfaces, as privacy management, being a natural and integral part of collaboration, should be supported directly in technology intended for collaboration. At the workshop I will use this perspective to discuss two examples of tools for collaborative writing: ShareLaTeX and Webstrates [10].

Privacy in online collaborative writing, as a form of management of access to the self, appears to be an under-researched topic deserving of more interest. Studying privacy in this light will afford a lesser focus on the *things* that are private and a greater focus on people's *enactment* of privacy. It will enforce a focus on practices and the way they continuously transform the privacy status of digital objects. This will be a helpful step towards designing technology that accommodates situated information practices. However, we must take care not to assume prematurely that we have characterized these practices to a satisfying degree, and we must likewise take care in how we apply our understanding of them.

Conclusion
Privacy is an ongoing collaborative achievement of social actors. The way people do privacy does not easily lend itself to technological solutions, such as automation, as these are not able to mimic people's contextual understanding and enactment of privacy.

Solutions are needed that properly accommodate the situated nature of privacy and the information practices supporting it. However, the situatedness is the very thing that may prevent the problem from being solved technologically.

Bridging this social-technical gap [1] will likely require both technological advances and advances in our understanding of privacy as practice.

Studies aiming to contribute to this understanding should have as their core focus *how people do privacy*, as opposed to how technology does it. I propose a perspective in which the transitions between private and public states of digital objects, as they relate to human activity, take center stage.

Acknowledgements

References Format
REFERENCES

1. Mark S. Ackerman. 2000. The Intellectual Challenge of CSCW: The Gap Between Social Requirements and Technical Feasibility. *Hum.-Comput. Interact.* 15, 2 (Sept. 2000), 179–203. DOI: http://dx.doi.org/10.1207/S15327051HCI1523_5

2. Jakob Bardram. 1998. *Collaboration, Coordination and Computer Support: An Activity Theoretical Approach to the Design of Computer Supported Cooperative Work. Ph.D. Thesis.* Ph.D. Dissertation. Aarhus University, Denmark. DOI: http://dx.doi.org/10.7146/dpb.v27i533.7062

3. Karen Church and Rodrigo de Oliveira. 2013. What's Up with Whatsapp?: Comparing Mobile Instant Messaging Behaviors with Traditional SMS. In *Proceedings of the 15th International Conference on Human-computer Interaction with Mobile Devices and Services (MobileHCI '13)*. ACM, New York, NY, USA, 352–361. DOI: http://dx.doi.org/10.1145/2493190.2493225

4. Paul Dourish and Ken Anderson. 2006. Collective Information Practice: Emploring Privacy and Security As Social and Cultural Phenomena. *Hum.-Comput. Interact.* 21, 3 (Sept. 2006), 319–342. DOI: http://dx.doi.org/10.1207/s15327051hci2103_2

5. Gilles Fauconnier and Mark Turner. 2006. Conceptual Integration Networks. In *Cognitive Linguistics: Basic Readings*, Dirk Geeraerts (Ed.). Mouton de Gruyter, Berlin, Chapter 9 (*Mental spaces*), 303–371.

6. Ruth Gavison. 1980. Privacy and the Limits of Law. *The Yale Law Journal* 89, 3 (1980), 421–471. http://www.jstor.org/stable/795891

7. Jonathan Grudin. 1994. Groupware and Social Dynamics: Eight Challenges for Developers. *Commun. ACM* 37, 1 (Jan. 1994), 92–105. DOI: http://dx.doi.org/10.1145/175222.175230

8. Kirstie Hawkey and Kori M. Inkpen. 2005. Privacy Gradients: Exploring Ways to Manage Incidental Information During Co-located Collaboration. In *CHI '05 Extended Abstracts on Human Factors in Computing Systems (CHI EA '05)*. ACM, New York, NY, USA, 1431–1434. DOI: http://dx.doi.org/10.1145/1056808.1056934

9. Roberto Hoyle, Srijita Das, Apu Kapadia, Adam J. Lee, and Kami Vaniea. 2017. Was My Message Read?: Privacy and Signaling on Facebook Messenger. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*. ACM, New York, NY, USA, 3838–3842. DOI: http://dx.doi.org/10.1145/3025453.3025925

10. Clemens N. Klokmose, James R. Eagan, Siemen Baader, Wendy Mackay, and Michel Beaudouin-Lafon. 2015. Webstrates: Shareable Dynamic Media. In *Proceedings of the 28th Annual ACM Symposium on User Interface Software & Technology (UIST '15).* ACM, New York, NY, USA, 280–290. `DOI: http://dx.doi.org/10.1145/2807442.2807446`

11. Jennifer Thom-Santelli, Dan R. Cosley, and Geri Gay. 2009. What's Mine is Mine: Territoriality in Collaborative Authoring. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '09).* ACM, New York, NY, USA, 1481–1484. `DOI: http://dx.doi.org/10.1145/1518701.1518925`