Better Together: Reciprocal Sharing and Social Sensemaking of Data

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Abstract

Much HCI research exists on Personal Informatics, to support individuals logging and engaging with their data. However, because of the individual nature of self-tracking, a lot of issues around meaningful reflection and the link to social interactions are still underexplored. In this paper, we discuss the value of social context towards understanding and making sense of one's own data, but also the different challenges it introduces for combined datasets. We draw attention to how "the social" changes the dynamics in all the stages of Personal Informatics and highlight new directions for research around sharing and collectively exploring data.

Author Keywords

Personal Informatics; shared personal informatics; social sensemaking.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

Life logging has increased in popularity over the past six years [1] and self-trackers are arguably becoming mainstream consumer devices. For the most part, research in HCI around Personal Informatics has been focused on individuals [4,6], but an interest has

emerged in looking at the social impacts of tracking [3,7,8] and the ways in which sharing personal data supports new means of reflection [5]. Although collection and reflection on data might be individual activities, they can still be influenced and shaped by the surrounding environment and social interactions [2], for example through informal discussions about personal trackers among friends and colleagues, or through participation in shared fitness practices, like running. An interesting question for HCI then, is how can these kinds of reflection be supported in data-driven ways? On one hand, reciprocal sharing of personal data could provide people more valuable context to make sense of their day-to-day activities [7]. On the other hand it introduces more challenges for PI tools for mediating this value exchange. We argue that there is still work to be done to understand these challenges.

In this position paper, we reflect on our recent research around how sharing fine-grained fitness tracker data could provide people with more valuable context for comparison and reflection [7]. We further point out areas which require more research, where collaboration could support people in tracking and making sense of data, and question the applicability of these findings for domains beyond personal informatics.

Social Sensemaking

Our previous work addressed reciprocal sharing of fine-grained fitness tracker data to support more meaningful social interactions and shared reflection. We designed and implemented an online platform called Citizense Makers that provides functionality for group sharing, annotating and discussion of fitness tracker data [7]. Our goal was to understand the value in sharing and interacting with others' data, and how this

could be brought out with suitable interactive tools. As part of this, we wanted to understand any issues around control and privacy that might compromise such interactions. We ran a two-week trial of the system where we asked people to use their personal Fitbit wearables and use the Citizense Makers platform to explore and share their data. The evidence from the study showed that with this type of data (e.g. Fitbit tracker data), the concerns of privacy might have been overstated. People were not overly concerned about their privacy if they could perceive the benefits of sharing their data with others. However, the value in sharing personal data with others was not always clear, and we found that people were more willing to exchange data if they shared a common activity, or similar interest or goal. In this way, they didn't necessarily need to know the data recipient, but they wanted to understand what benefit the recipient might get from the shared data.

Appropriate sharing control mechanisms
Different data streams will come with different notions of sensitivity for those sharing them. For example, people are less concerned about the privacy when sharing step counts from a fitness tracker, but when sharing physiological indicators (e.g. heart rate) or location these concerns are much more evident. In our study [7], we found that in having more nuanced controls for sharing than simple off/on switches, people could start sharing snippets of their data that they felt comfortable with (e.g. only daytime data). Although, these mechanisms provided people with more control, they still wanted to understand the reciprocal value of shared data before providing access.

This poses interesting design challenges for HCI: how can data sharing interfaces allude to how data might be explored and understood by others prior to sharing? There is a need for more investigation of the challenges associated with setting up an environment which allows people to share, explore and reflect on their personal data, while remaining in complete control over it. Shared PI systems should aim to give people full control over their data, which we argue involves understanding how their data might be used or interpreted by others. In [7], we suggest that data 'cuts' that capture meaningful everyday activities and practices might be suitable units for beginning to address these challenges. First, because they are sensible units for understanding data and its content and, as a result, for better controlling access to it. And second, because assigning semantics to subsets of the data in this way could allow us to computationally assess its potential sensitivity and flag this prior to sharing, for example if a routine activity like 'traveling to work' deviated from the norm in its data or time profile.

Seeing shared experiences in data
People were particularly interested in seeing shared events in data where they engaged in a specific activity with their peers (e.g. a football match). Drawing on Rooksby et al. [8], shared PI tools should help people identify these events (e.g. using 'cuts') and elicit better reflection on these co-tracking datasets. Adding more meaningful social interactions to personal informatics tools and moving away from the individual nature of self-tracking would support people with reflection and elicit behaviour change, and help avoid temporal lapses [4] in tracking.

Social context
Simply comparing one individual's dataset with another one without any additional information did not help in reflection. Merely numerical values are not enough for people to make sense of other people's data and draw comparisons. They needed more context about the activity, location or state of mind. The CM interface [7] provides a discussion board where people could annotate data and/or prompt others to reveal additional information about a specific section of the data (Appendix 1). People saw more value in annotated datasets because it allowed them to compare shared activities, led them to ask questions of their own data (often explicitly posed by friends or colleagues as comments), and to understand how others interpreted their data.

Different types of collaborations
With shared personal informatics, we can distinguish two different kind of tracking: *collaborative and collective*. Collaborative tracking is when people work together as group, sharing a physical space and activity while engaging in tracking practices. Although every individual collects their own data and it can be reflected upon in isolation, it would become more meaningful as a combined dataset as it would provide relevant reference points from which to interpret it.

Collective tracking on the other hand consists of individual efforts, which can be combined to serve a common goal. With collective tracking people might have different end goals, but by sharing data they might provide reference or insights for others. This more open-ended practice is more challenging to design for because the value in sharing data may not be as obvious, and the network of sharers may be

broader than friends and colleagues and hence more anonymous. However, we see significant potential in pursuing both collective and collaborative approaches, also in domains outside of Personal Informatics.

Shared personal data
An interesting data relationship is around people playing team sports. Although, individuals could look at their data in isolation, it makes much more sense to join the datasets to get more value out of it. How would people make sense of the combined dataset to understand current practices, improve the performance of the team or offer peer-support to each other?

Personal data and civic participation
How might personal datasets be brought together to support civic agendas, for example? This might be a city trying to improve its sustainability, or a neighbourhood community trying to understand how to improve the quality of life of its residents. With these quantified communities, the data relationships between individuals might also be accompanied by peoples' interactions with the lived environment. For example, by merging personal informatics data with city data (e.g. environmental data), we would create more versatile and multifaceted data relationships, but could risk introducing a level of complexity that might be off-putting to citizens. Would these datasets support collaboration between individuals and add valuable context towards sensemaking?

Based on our research on sharing and social sensemaking of personal informatics data, we suggest that critical avenues for future HCI research will be around (1) elucidating the social and political value for others in participating in such sharing practices, (2)

defining relevant contexts for collaborative tracking and verifying shared data, (3) understanding how other anonymous users (such as marketers or insurance companies) might understand and interpret an individual's personal data, and most importantly, (4) being able to exert sufficient control over this.

Conclusion
More value can be achieved from personal informatics data through reciprocal sharing and social sensemaking, as long as appropriate tools are provided for this. This includes analytical tools for understanding combined datasets but, importantly, also includes tools for sharing and for understanding how individual data might be perceived and interpreted by others. We believe there is significant potential for social data to drive and support digital civics agendas, but the challenges that exist around sharing personal informatics data will also require particular attention in these new domains.

Me, Myself and Data
Aare Puussaar is a Ph.D researcher in digital civics at Open Lab in the School of Civil Engineering & Geosciences at Newcastle University. Prior to that his work involved dealing with large location information databases and studying mobile positioning data by transforming mobile operator billing information into meaningful location information. He has worked together with different consortiums on number of projects using modern data processing architectures to extract knowledge about people's mobility and activities from passive mobile positioning data.

It was there that he developed a fascination with data and how it can enable us to unravel our lives. He has

also been a self-tracker for about six years now: mostly tracking movements, physical and physiological factors. Over the years, he has tested multiple applications to collect and understand his life through numbers. Seeing the limitations and lack of customisation, he has developed his own systems for collecting raw sensor data and merging it with other datasets. The aim of this has always been to enrich personal data by adding more context to it.

Questions that the researcher is interested in exploring are (1) the social and individual value in sharing data and (2) theoretical and practical mechanisms for reflections on shared datasets.

Acknowledgements

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Appendix
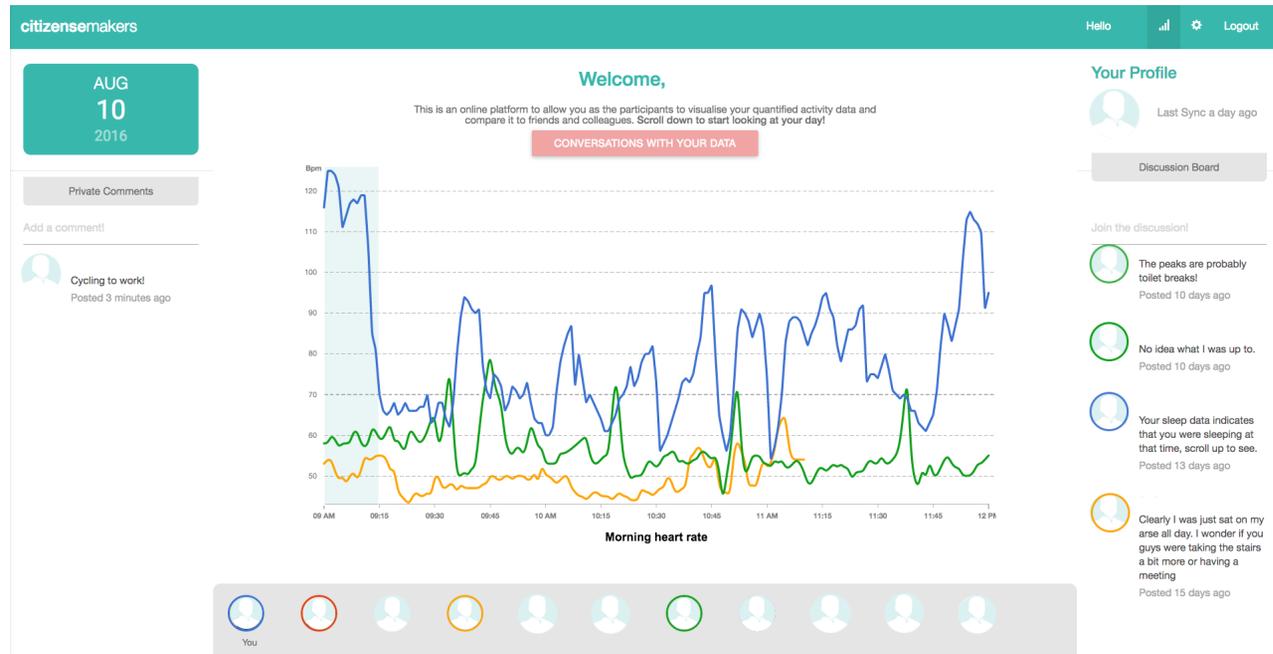
Appendix 1: Screenshot of Citizense Makers interface. Right – personal comments, Left – Discussion board, Middle – visualisation of fine-grained heart rate data.