Understanding Temporality in Personal Informatics for Psycho-Physical Wellbeing

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Abstract
Past research identified complex temporal patterns in how users interact with personal informatics systems. Yet, the inherent variability in personal tracking was viewed as a challenge and less of an opportunity. A better understanding of the temporality of personal trackers can help build more engaging tracker experiences. Our work investigates how using a fitness tracker evolves over days, months and years. Through an interview inquiry, we explored user stories that describe how fitness goals evolve over time. Further, we researched when users looked at fitness trackers and applications during their days. Based on our findings, we propose an agenda for improving personal informatics through a temporal perspective. We emphasise the need to account for constant goal evolution and exploiting opportune moments for meaningful reflection and social interactions around tracker data to support the users’ physical and mental well-being.

Introduction
Fitness tracking is at a crossroads. The ever increasing number of wearable trackers show that more and more users anticipate the benefits of wearing a tracker. On the other hand, long-term clinical studies show that trackers do not have a significant impact on key health indicators [5]. Furthermore, to date, the usual fitness tracker is designed for mentally stable, able-bodied users [10]. As a conse-
sequence, designers and the Human-Computer Interaction (HCI) research community need to look for new less normative ways to understand the fitness tracking experience and augments it in ways that will make tracking more meaningful. While research build a considerable understanding of current practices around fitness tracking [2], it remains a challenge to design new tracker experiences that keep users engaged and lead to tangible long term benefits in wellbeing. In this position paper, we report on our approach to improving fitness tracking — understanding and designing for the temporal aspects of the personal health informatics experience.

**Redesigning the Personal Informatics Experience**

First, we look at the long-term tracking experience. Past research contributed models of how using a fitness tracker unveils over weeks and months. Li et al. [6] identified phases needed for reflecting on tracker data and Epstein et al. [3] extended that view by including the ways users stop and return to tracking. While these models provide an overview of how users change their attitudes and activities in fitness tracking, they put less emphasis on how the relationship between the user and their tracker evolves over time. In our recent work, we conducted a study where we tried to understand how users’ fitness goals evolve over time [7]. We found that the needs that underlie fitness goals changed over time and that users often found it difficult to relate to quantitative fitness goals.

Consequently, our future research will explore when fitness goals evolve and how to present them so that they stay engaging in the long term. Currently, we are conducting a survey to understand how to best present fitness goals at different stages of the tracking experience. We believe that future trackers can deliver the right prompts at the right moment in time to sustain long-term engagement and lead to tangible health benefits.

**The Right Time for Reflection**

In our work, we also explore the daily rhythms of using personal informatics tools. We observed that there was a large variety of when and in which context users interacted with their trackers and tracker applications during the day. Concurrently, trackers provided notifications which were often perceived as not motivating, mistimed or even as additional burden. Past research suggests that reflection is necessary to enable users to understand the meaning behind their tracking data and foster long-term improvements in wellbeing. Yet, current trackers do little to help users find the right time for reflection, encourage social support in understanding data or integrating reflection in everyday routines.

We are currently conducting a research programme that attempts to find ways to identify opportune moments for interacting with tracker data for individuals and groups. We designed a mapping tool that helps designers explore the temporal patterns of everyday interactions and identify when possible tracker reflection can take place. We believe that identifying when to deliver prompts for reflection will enable providing meaningful suggestions for adjusting routines and directly actionable goals. This, in turn, could empower the users to adhere to desirable behaviour patterns.

**Responsible Interaction Design for Mental Wellbeing**

An increasing number of HCI papers focus on various facets of mental wellbeing [12]. Personal informatics systems can offer support in multiple application areas, such as behavioural therapy [9], substance addiction [4] or peer support chats for mental health [8]. These systems often include methods such as mindfulness-based intervention or meditation to reduce stress and improve wellbeing.
Past research shows that mindfulness-based interventions can have a positive effect on mental and physical wellbeing [1]. This, in turn, leads to high responsibility for HCI researchers, interaction designers and practitioners.

For instance, the concept of mindfulness can be generative and inspire designs that support mental and physical wellbeing [11]. However, recent works in Human-Computer Interaction (HCI) use the term ‘mindfulness’ to describe a multitude of ideas and approaches, which can potentially lead to confusion for the user what the system at hand does and what it can offer. Our latest work explores that different meanings of mindfulness and how they are expressed through the design of interactive artifacts. We believe that conceptual clarity can help to identify opportunities and challenges for future HCI research into mindfulness based technologies and could support the decision process of potential users of these interventions. We believe that the HCI field has a responsibility to build a structured understanding of these concepts in order to establish guidelines that will prevent the creation of potentially harmful technologies. As digital wellbeing becomes a growing concern, we hope that harnessing mindfulness in HCI can help mitigate the potential negative impact of technology use on wellbeing.

Conclusion

Our work explores the intricacies of the temporality of personal informatics experiences. In two concurrent studies, we are now exploring long-term and daily patterns of personal informatics. We want to engage with patterns over weeks and months to be able to design systems that better support goal evolution. Furthermore, we are analysing daily routines to identify opportune moments for reflection that may foster an improved understanding of personal data. In addition we are working on a structured understanding of mindfulness based interventions in the field of HCI. We hope that our efforts will help build improved personal informatics tools that contribute to the wellbeing of individuals.

REFERENCES


