Beyond Data Tracking: A Proposal to Design Health Interfaces for Learning and Sharing

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Abstract

This workshop position paper argues for building interfaces that integrate people's real-world needs in personal health tracking. To achieve this, this paper proposes building user interfaces that support people's curiosity towards self-knowledge and their desire to socialize goal-oriented progress. Drawing on examples from popular applications and recent social computing systems, this paper suggests adding more learning and collaborative tools to researchers' prototyping toolbox.

Keywords

personal informatics, social computing, intelligent user interfaces

1. Introduction

Innovations in hardware and software have created immense opportunities for citizens and healthcare experts to track useful condition-specific health data. However, real world deployments of such tools consistently finds patterns of non-use. Virtual rewards and gamification elements have demonstrated mixed success [1]. This position paper argues for building interfaces that integrate people's real-world needs in personal health tracking. Promising approaches include serious games that integrate real-world contexts and digital coaches that support goal-driven progress [2, 3]. However, many such approaches use costly and cumbersome user-facing elements, like 3D interfaces for handheld platforms or automated agents; further rigorous evaluation needs to check for the real-world success of such ideas. This paper proposes a complementary approach: let's build user interfaces using ideas from learning and social psychology. Two such levers include people's curiosity in self-knowledge and their desire to socialize goal-oriented progress. To help get started with, this paper draws from both recent research systems and popular commercial applications with successful field deployments.

2. Supporting Curiosity and Knowledge Production

Back in the 90s, learner-centered design and education proposed designing interfaces that support learning in the classroom and the professional setting [4]. Fast forward three decades, learning resources and collaboration platforms are ubiquitous on the internet; however, learner-centered ideas have had limited effect on the design of prototypes across many domains, including healthcare. One glaring omission is the absence of structured support for informal learning beyond youtube (or similar) videos. Health tools and apps have focused on collecting data *from* people but less on build-

Joint Proceedings of the ACM IUI 2021 Workshops, April 13-17, 2021, College Station, USA

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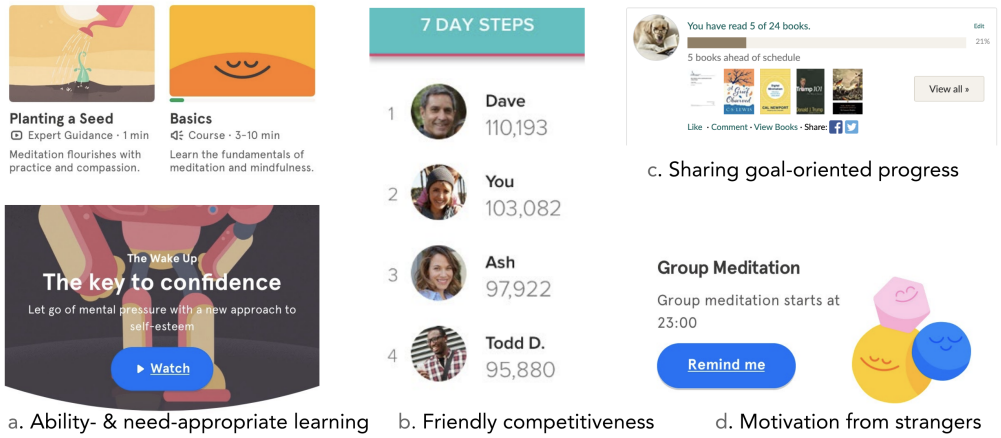

a. Ability- & need-appropriate learning b. Friendly competitiveness c. Sharing goal-oriented progress d. Motivation from strangers

Figure 1: Modern health and well-being apps like Headspace, Fitbit, and goodreads provide design choices that foreground people's learning and socializing needs (headspace.com, fitbit.com, goodreads.com). Copyright of these images remain with the respective platforms.

ing capacity *in* people.

Capacity-building tools require appropriate learning support for complex activities that draw on people's needs like improving self-knowledge, meeting goals, and contributing to society. First, many people–e.g. Quantified Selfers–demonstrate a need for improved self-knowledge about how their choices affect their health. This curiosity provides the opportunity to create a setup for problem-based learning: the person is primed to receive guidance on how to draw value from personal health tools. Second, people draw value from meeting personal goals; e.g., simple curiosity about meditation might get people started; making progress towards their goals (e.g. developing confidence or reducing anxiety) might keep them going. Third, people's altruistic nature—as demonstrated in citizen science projects— can also contribute useful knowledge that can further our understanding of health and well-being. Personal context provides a great setup to educate people about scientific knowledge production; interested people might contribute back with useful insights, rather than just sharing data. Widely deployed health apps and tools provide the opportunity to convert people's questions and intuitions into valid scientific knowledge that might be useful for individuals and for broader society. How do we meet these three objectives?

Making progress in a new task requires appropriate resources. Purely conceptual knowledge might provide lesser gains in people's quality of work than providing concrete procedural guidance [5]. Commercial apps exemplify this need for complex learning support. For instance, sitting still with few thoughts for 20 minutes during a meditation session rarely comes simply to many. To support people in this challenging task, the Headspace meditation app (headspace.com) (Fig 1a); provides 1) conceptual support with an extensive catalog of learning resources for both novices and experts, 2) procedural support with guided meditation, 3) emotional support with monks' reflections, and 4) motivational support with celebrities' words of wisdom.

Personal health provides an immediately

accessible and applicable area for people to learn and implement scientific skills. While people's contextual knowledge about themselves can yield potentially novel insights, citizen participation in research rarely goes beyond expert-defined tasks. Structuring knowledge production to make it directly useful for people might improve citizen contributions. People have gone beyond being data donors to creating personally-meaningful insights by running experiments using systems like Tummy Trials and Galileo [6, 7]. By supporting scientific explorations, such tools act as in-situ cognition aids that support "thinking through doing". Other avenues to suppot scientific work includes testing existing scientific theories for themselves, e.g. about running and heart rate.

3. Socializing Goal-oriented Progress

Many current health applications support sharing updates on prominent social media platforms like Facebook and Twitter. Such "reach-optimal" efforts are useful in reaching broad audiences but they are sub-optimal for receiving useful feedback: posts typically receive low-effort feedback such as likes and "Keep going!" comments. Furthermore, such broad social sharing soon gets lost in the cacophony of social media posts from hundreds of friends and followers. This proposal argues that people's need to socialize goal-oriented progress is better met with a tighter task/hobby-focused group. Drawing from commercial applications, this proposal suggests two options: 1) situate online sharing in real-world efforts; and 2) build social accountability.

One way to motivate people is to convert a private goal into a broadcast goal with others performing similar tasks; such *communities of practice* implicitly value actual real-world progress. The goodreads service nudges people to set annual book reading challenges that are then broadcast on their friends' goodreads feed (Fig 1c); seeing others' goals and the books they're reading provides further motivation. Such goals can also be tinged with friendly competition. Consider Fitbit's weekly steps challenge (Fig 1b);: people share weekly steps counts with other (willing) friends. Comparing the actual number of steps is both fun and motivating as the leaderboard changes with each day. Another way is to build social accountability with more rigid mechanisms than what we have now. Prior social computing work demonstrates two insights: 1) a *bus stop* model–where participants move through learning stages in cohorts–provides greater retention and achievement and, 2) explicitly setting *activation thresholds* make reciprocity obvious: failure to comply will doom the entire group's efforts [8, 9].

Acknowledgments

Thanks to the anonymous reviewers for their thoughtful comments that improved this proposal's link to existing research.

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