Me-to-We Design: A Blueprint for Enriching Welfare Technologies

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Abstract. Current technologies for ambient assisted living leave underexploited that social interaction is key to human wellbeing. Me-to-we design provides a blueprint for enriching such welfare technologies with social interaction. We present the five stages of me-to-we design, illustrate how it may transform a common class of welfare technologies, and discuss the distinguishing features of me-to-we design. These features include scaffolding social interaction around an activity and supporting transitions among the five stages. In contrast, most current welfare technologies support only some of the five stages and, thereby, either bypass social interaction or presuppose that social relations already exist. Me-to-we design offers a blueprint for building social relations stage by stage if they do not exist up front. It is for future work to validate whether the blueprint in practice delivers welfare technologies that are enriched by its profoundly sociotechnical approach.

Keywords. Welfare technology, ambient assisted living, me-to-we design

1. Introduction

Welfare technologies (outside of Scandinavia also known as *ambient assisted living technologies*) are technologies for assisting elderly and frail citizens in being more autonomous in their activities of daily living [1]. Examples of welfare technologies include assistive devices such as companion robots for cognitive stimulation, smart-home technologies such as motion sensors for fall detection, and information technologies such as online meetings for consultations with general practitioners. These technologies aim to serve the double purpose of improving the citizens' quality of life and freeing up resources in home care and other health services. Yet, current welfare technologies tend to focus on single-person use and leave underexploited that social interaction is immensely important to human wellbeing. This paper proposes me-to-we design [2] as a blueprint for enriching welfare technologies with social interaction.

The connection between social interaction and wellbeing is partly direct and partly mediated through the impact of social interaction on physical health [3]. One explanation for this connection is that social interaction fosters fellow feeling – a sense of mutual identification and sympathy – and that this feeling is central to why things matter to people, thereby instilling meaning and motivation [4]. Thus, it appears that social interaction can boost the intended effect of welfare technologies in at least three ways: through its effect on wellbeing, through its effect on physical health, and through its effect on motivation. In the following, we present me-to-we design, describe how it could transform a common class of welfare technology, and discuss its distinguishing features.

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2. Method

To create the blueprint for enriching welfare technologies, we applied the method of design thinking, in particular its ideation process [5]. The starting point in our ideation process was to expand the design object from the technology as such to the full sociotechnical system. By including considerations about the context of use in our design thinking, it became apparent that social interaction tended to be underutilized in current welfare technologies in spite of its immense importance to human wellbeing. As a result, our ideation process converged on incorporating social interaction in the design of welfare technologies and, specifically, on a blueprint for me-to-we design.

3. Results

3.1. The Blueprint: Me-to-We Design

Me-to-we design was originally devised to reconnect museums with their audiences [2]. Its basic principle is to replace single-person activities with personally rewarding, social activities. Me-to-we design posits that such activities can be fostered by exploiting that personal entry points are an effective means of scaffolding social activities. That is, a personal entry point (me) provides the groundwork for erecting progressively more social activities (we). To move from individual toward social activities, me-to-we design provides a blueprint with five stages, each presupposing the lower-level stages:

1. *Individual consumes options:* At this stage, the use situation is construed as a single-person activity where the user consumes pre-set options without much provision for influencing them. In a museum context, this stage means that visitors are provided with access to the content they individually seek.
2. *Individual interacts with options*: At this stage, the use situation is still a single-person activity, but the user is involved in constructing and reconstructing the situation. For example, the museum visitor is provided with opportunities for asking questions and taking individual action.
3. *Individual interactions are networked in aggregate*: At this stage, the outcome of a user's activities is made available to others for inspiration and motivation. For example, museum visitors can at this stage see what others have attended to and where their own interests fit with the wider visitor community.
4. *Individual interactions are networked for social use*: At this stage, the individual user connects with other people who have the same interest and undertake similar activities. For example, museum visitors connect digitally to share experiences from their individual museum visits.
5. *Individuals engage with one another socially*: At this stage, users meet physically to pursue activities related to their shared interest. In the museum context, this stage means that visitors experience the museum as full of potentially enriching social encounters.

The ideal is not that everybody should reach the fifth stage. Different users will prefer different stages. The proposition of me-to-we design is that each stage will attract some users and that most users will make use of multiple stages.

3.2. Vision for Me-to-We Transformation of Training Technology

In Denmark, training technology is the class of welfare technologies that has contributed most benefit in recent years [6]. It is used for health promotion, preventive care, rehabilitation, and the like in still more Danish municipalities. The training technologies in use include apps, sensors, virtual reality (VR), and video consultations. An example is the app Exorlive, which provides its user with ready access to a large catalog of training exercises that are explained in videos.

Training technologies such as Exorlive are at Stage 1. Their purpose is to make it possible for users to train on their own. Rather than receiving instructions and encouragement from a healthcare professional or a fellow patient, the user individually follows on-screen instructions. If an instruction is not understood the first time, the video can be re-viewed. These technologies make it possible for individual users to train when it suits them, but there is no social component to help sustain motivation or detect errors in how users perform the exercises. Training easily becomes a dreary chore even though VR training technologies often introduce a game element.

At Stage 2, the technology must be responsive to the user's performance. Exorlive is not. In contrast, some game-like training technologies have levels with increasingly demanding exercises and dynamically assign the user exercises that match their evolving abilities. By tracking the user's performance and providing statistics about it, the technology helps the users stay disciplined about their training. The technology may also provide a facility for consulting a healthcare professional with training-related questions, such as whether an exercise should be aborted if it causes pain. Training is still a single-person activity, but it has become better matched to the individual user.

To move to Stage 3, the technology should provide for sharing the individual user's statistics with those of other users. Even without connecting directly with these other users, their aggregate performance creates a social context for the individual users' perception of their own training. They will be encouraged by seeing that others make progress. Similarly, receiving information that other users do their exercises will likely strengthen the individual users' motivation to do their own exercises: If they can do it, then maybe I can too. This way, the training is embedded in a social context, but merely a rudimentary one because it lacks direct interaction with other people.

Stage 4 involves forming online training teams. The technology must provide for forming such teams and for them to meet online. Team members may, for example, arrange to meet online twice a week to do their exercises. The team members remain in their individual homes, but they become accountable to one another for attending their joint online training sessions. By having these sessions as video meetings, the team members make their training effort visible to one another and create occasions for social interaction to arise – about the training, their homes, and so forth. Training is no longer just about the individual user's personal exercise; it is also about being part of the team.

At Stage 5, team members meet with one another for face-to-face training sessions or to take part in events that mark important milestones in their rehabilitation, such as being able to go out dancing again. Technology must support the teams in scheduling their sessions, including support for forming teams with members who live in the same neighborhood. Meeting face to face creates further possibilities for social interaction and, thereby, embeds the training in a potentially rich social context that brings together people with similar health issues. Training has been transformed from something that requires personal discipline to a socially driven experience – from me to we.

4. Discussion

We acknowledge that multiple welfare technologies and research projects within ambient assisted living focus on social interaction [e.g., 7–9]. What me-to-we design offers is, partly, a conceptual framing for reflecting on how these technologies incorporate social interaction and, partly, a blueprint for deriving more benefit from social interaction in future welfare technologies. Below, we elaborate on five features of this blueprint.

First, me-to-we design *takes a sociotechnical approach* to the design of welfare technology. The design of sociotechnical systems is demanding because of the large number of variables. However, it may also be rewarding because it is through their inscription in social contexts that technologies become interlinked with the things that matter to people. We contend that current training technologies tend to be designed for single-person use (Stage 1) and have described how they could benefit from me-to-we design to avoid becoming monotonous and underused. However, we also acknowledge the presence of welfare technologies designed for connecting geographically dispersed families, combating loneliness among elderly people living alone, and calming the user through social interactions [8]. These technologies already attend to social issues (Stages 3 and 4), but they tend to focus exclusively on enabling conversation.

Second, me-to-we design *scaffolds social interaction around an activity*. Thereby, the social interaction is about something. This scaffolding is particularly important when the technology aims to create interactions among people who do not know one another beforehand [7]. It is easier to start talking with someone about a current and shared activity, such as training, than to start from scratch. However, the scaffolding around an activity may also enrich interactions with family and friends. For example, family and friends may livestream activities to include elderly people through real-time virtual presence when physical presence is not possible [10]. This way, elderly people can join family outings to loved places or attend their grandchildren's graduation ceremony. Such real-time inclusion in activities through livestreaming is more fulfilling than a post hoc narration during a video call set up with an exclusive focus on conversation.

Third, me-to-we design *invites diverse entry and end points*. The preferred balance between social interaction and focal activity will differ across users and technologies. The me-to-we model does not prescribe that the user should start at Stage 1 and end at Stage 5. Rather, welfare technologies should allow for users to start and end at the stages that best match their preferences. To do so, the technologies must provide support for all five stages. One way of achieving this goal is by supplying multiple technologies, each focusing on a subset of the five stages. Alternatively, it may be possible to devise generic components for extending a welfare technology with functionality supporting social interaction (Stages 3 to 5).

Fourth, me-to-we design *supports transitions from one stage to another*. For example, training technologies that extend individual users' access to their own statistics with possibilities for sharing them with other users support transitioning from Stage 2 to 3. Similarly, technologies that enable livestreaming support transitions back and forth between real-time inclusion in activities (Stage 4) and merely talking about the activities in the aggregate (Stage 3). This way, me-to-we design leads to technologies that support the transition from single-person use to communal use. In contrast, welfare technologies such as the telepresence robot OriHime [9] and online consultations with healthcare staff [6] presuppose that the users already have a relation and a recognized need for communicating with one another. By skipping the lower stages of the me-to-we model, these technologies do not support the gradual building of social relations.

Fifth, me-to-we design *attends to the social*. It provides a blueprint for fostering social interaction and exploiting its positive effects on motivation, health, and wellbeing. By attending to the social, me-to-we design provides needed contrast to the many technologies for surveilling elderly people in their homes for safety reasons [11], motivating them with exergames for training reasons [12], or stimulating them with social robots for companionship reasons [13]. These technologies pose ethical dilemmas about privacy and pseudo-social interaction. Rather than exploiting the positive effects of social interaction, these initiatives bypass it to preserve human resources, which are presumed to be scarce. Me-to-we design challenges this presumption by seeking to create meaningful social interactions among users who are engaged in similar activities.

5. Conclusion

It is challenging to design welfare technologies that truly assist elderly and frail citizens. We have proposed me-to-we design as a blueprint for enriching such technologies. Me-to-we design contributes ideas and stages for inscribing welfare technologies in social interaction and, thereby, interlinking them with things that matter to people's health, motivation, and wellbeing. To assist elderly and frail citizens in an effective and fulfilling manner, the authors would like to test the validity of the blueprint in future work.

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