Fictional Narratives for Clinical App Development

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Abstract

This paper presents the use of fictional narratives in participatory design for health information technology (HIT). We used the case of an established occupational therapy assessment tool to investigate how fictional narratives can aid de-sign workshops and their outcomes in the health domain by means of participatory principles. The methodological findings show how a fictional narrative can be adopted in a di-verse manner across design workshops by practitioners and participants with a research background. Also, the importance of tailoring fictional narratives towards specific participants in the design process is emphasised.

Keywords

Fictional narratives, Participatory design, Health information technology, Occupational therapy

1 INTRODUCTION

The digitization of work procedures by means of health information technology (HIT) implies a number of benefits, such as safer health-care systems, reduced expenses, increased accessibility, improved quality and reduced medical errors (Abugabah and Alfarraj, 2015; Agarwal et al., 2010; Chiasson, 2007). However, at the same time, digitization has also proven to be challenging, presenting problems such as unreliability, lack of usability, difficulty in terms of integration into the workplace, and lack of involvement by future users in the decision process (Abugabah and Alfarraj, 2015; Karsh, 2010; Ventola, 2014).

A recent review study has shown that involving users in the design process increases the probability of the end product or technology becoming a success (Bano and Zowghi, 2015). This paper reports on parts of the development of a digital version of a current paper-based investigation tool for occupational therapists. The intention was to achieve some of the benefits of HIT mentioned above; and, at the same time, to reduce the challenges associated with digitization in the health domain. Specifically, we used a variation of fictional narratives (Brandt et al., 2013) in participatory design workshops to identify the novel potential of digitizing a tool well-known to the workshop participants. Fictional narratives have previously been used for technology design in the leisure domain (a marine centre) (Iversen and Dindler, 2008), in a museum context (Dindler, 2010), and in education (Brodersen et al., 2008). With the present paper, we chose to analyse the applicability of fictional narratives in the design of work-based health technology.

2 FICTIONAL NARRATIVES AND PARTICIPATION

Fictional narratives represent one technique among many in the participatory tool box. Brandt, Binder and Sanders (Brandt et al., 2013) applied the concepts of telling, making and enacting to organise participatory design techniques and elucidate their strengths in the design process. Telling concerns activities that support participants in telling about their experiences and imaginings with respect to everyday life and activities. The purpose is to identify problems and opportunities that can be considered, accounted for and incorporated into new designs. In regard to making, participation consists of participants creating physical artefacts as a kind of embodiment of their thoughts and ideas. In enacting, participants try out future scenarios by enacting their imaginations regarding future possibilities. Participatory design practice combines telling, making and enacting to capture the insights gained from the design process (Brandt et al., 2013).

Fictional narratives belong to telling techniques (Brandt et al., 2013). Fictional narratives are also an example of how fictional design spaces can be created in participatory design (Dindler, 2010). The idea behind fictional narratives is that by presenting participants with imaginative spaces in the design process, a more open and explorative design space can be created. This explorative space then allows participants to remove themselves from the current practice they might face concerning the design challenge at hand (Brodersen et al., 2008). Fictional narratives can take different forms, such as imagining the Olympic Games (Brodersen et al., 2008), a murder case (Brodersen et al., 2008) or a tale of Atlantis (Iversen and Dindler, 2008). With the present paper, we investigate the utility of this technique

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amongst participants well acquainted with a professional tool that will be digitized in the near future. Our use of the technique is directed towards the form of the digitization, as the tool under revision should still be kept at a principal level. We will use the methodological outline and the documentation of the workshops to reflect on the usefulness of the fictional narrative developed for a specific, work-based case.

3 THE ETUQ CASE

The current design project concerns the specific design of a mobile application for data collection based on the principles of the established occupational therapy tool, the Everyday Technology Use Questionnaire (ETUQ). Everyday technology plays an increasing role in everyday activities and has in many ways changed how people participate in them. In many cases, technology has become a prerequisite for various activities; for instance, using a TV remote control, a coffee maker, or collecting a train ticket in a kiosk Also, communication requires mobile phone, tablet or computer skills in order to contact family members and various social groups. Although, in general, technology is aimed at improving access and reducing effort, it can also be a barrier to accessing certain activities should one have limited technological skills or abilities. The ETUQ is a questionnaire that offers a systematic method for capturing clients' or groups' perceived difficulties in using everyday technologies alongside the relevance of such technologies in their everyday lives (Nygård et al., 2015; Rosenberg et al., 2009). The ETUQ was developed to target older adults, but can also be used with adults in general.

The ETUQ comprises a semi-structured conversation whereby the interviewer documents the respondent's answers on a paper-based questionnaire. The questionnaire contains background information about the client along with technologies grouped into seven topic areas: (1) home maintenance, (2) information and communication, (3) self-care, (4) maintenance and repair, (5) accessibility, (6) finances and purchasing and (7) travel. The ETUQ form, comprising 13 pages, includes a total of 90 technologies to rate and comment on. The ETUQ is used, administered and completed by occupational therapists, at either a hospital, a care home or a patient's home (Nygård et al., 2015; Rosenberg et al., 2009). The ETUQ is used in occupational therapy practice to characterise technology use by citizens and for research purposes.

In the present study, we used the development of a mobile app version of the ETUQ as our case. The purpose of the design process was to develop a digital version of the ETUQ to facilitate occupational therapists' data collection with greater ease, both while collecting the data *and* in subsequent data processing (transferral to desktop, exchange with colleagues and data analysis).

4 MATERIALS AND METHODS

Spinuzzi outlined three stages in participatory design processes: the initial exploration of the design use context (stage 1); the follow-up discovery process whereby goals are identified and design values are stated (stage 2); and, finally, the iterative development of the technology (stage 3) (Spinuzzi, 2005). In this design process, design workshops correspond to the second stage. Ahead of the design workshops, the authors of this paper followed a 1-day course along with a group of occupational therapists. The course introduced the background and principles of the ETUQ alongside instructions for correct use. The course also demonstrated an example of how a full ETUQ investigation is carried out. The course participation represented our initial exploration of the use context of the ETUQ, which is important in terms of communication with the workshop participants. The course also provided valuable inputs to the development and form of the design workshops. As the purpose of this paper is to present methodical perspectives on the design workshops, we will not elaborate further on stage 1 and 3 here.

4.1 Workshop participants

The segmentation of users represents a specific challenge in HIT due to conceptual and pragmatic barriers across user groups (Mønsted and Onarheim, 2010). In the present project, we identified two core user groups on the basis of both the nature of the ETUQ tool and the purpose of the technology to be designed: (1) users applying the ETUQ in clinical practice, and (2) users applying the tool for research purposes. We invited participants from both groups to the workshops in order to reflect both current and future users of the ETUQ. One workshop consisted of participants with a clinical perspective (three participants, workshop 1). The other workshop included participants with a research perspective on the ETUQ (six participants, workshop 2). All participants were women with a background in occupational therapy and practical experience using the ETUQ. The participants were recruited in different ways. The research participants were invited from the occupational therapy research environment at Karolinska Institute in Stockholm, which is responsible for researching and teaching the continuous development of the ETUQ. The clinical participants were recruited from a pool of former ETUQ course participants in Sweden. For practical reasons, we invited participants who lived within reasonable distance from Stockholm, where the workshops took place. Every participant filled out an informed consent form at the introduction of the workshops. The workshops were conducted at Karolinska Institute, Division of Occupational Therapy, in Stockholm, Sweden. All participants were Swedish, but the workshops were conducted in English to avoid any misunderstandings between the Swedish participants and the Danish workshop facilitators.

4.2 Developing the fictional narrative

One overall fictional narrative was developed for use throughout both workshops. The fictional narrative framed the workshops and acted as a bridge between the exercises carried out. Specifically, we used a sequence from the 2002 American science fiction movie, 'Minority Report'. The movie tells the story of a policeman who, in the near future, solves murder cases before they are even committed (Minority Report, 2016). In the sequence, the lead role involves investigating a murder by means of various ICT-based solutions and features of the future as detected in the present, including video conferencing, gesture-based user interfaces, grouping, ungrouping and comparing content. In this sense, the movie sequence represents a movement forwards and backwards in time. Backwards, because the movie is not entirely new; and forwards, because the sequence is presented in a science-fictional fashion, depicting what technology will allow humans to do in the future. We wanted the workshop participants to make the same movements by means of the narrative, going from somewhere well known to a new and unknown place with the existing tool. The fictional narrative was intended to support the participants in framing their current experiences with the tool alongside their future expectations for a digital version. We used the fictional narrative to illustrate this movement in time and space to the workshop participants.

The fictional narrative chosen for the workshops addressed the form rather than the content of the concepts developed within them. Developing the fictional narrative, we knew that the participants had experience in using the ETUQ. Generating a digital version of an existing tool as the goal of the design process also meant that the principles of the tool established some guidelines regarding how far the idea generation could go during the workshops. To compare, earlier examples of fictional narratives have addressed the King of Atlantis at a marine centre (Iversen and Dindler, 2008) and a story about the Egyptian pharaoh Tutankhamun at a prehistoric museum (Dindler, 2010). In these examples the idea generation carried out at the workshops concerned the content and themes of the design solutions identified. In the fictional narrative reported here, the form of the design is emphasised more, as the technology comprises the core of the narrative.

4.3 Workshop exercises

The workshops consisted of three exercises. To guide and connect the exercises, an overall challenge was presented to the participants. The challenge was defined as: 'Explore how we can create an app that protects the core values of the tool, leaves the biggest challenges behind, and develops the potential of the tool'. The three exercises were developed on the basis of the overall challenge. Due to differences in the participants' experiences in using the paper-based version of the ETUQ, the first exercise served the purpose of identifying the core values of the tool.

Figure 1. Participants working in workshop 2.

The second exercise was concerned with identifying the challenges experienced using the tool. The last exercise revolved around the potential for a digital version of the ETUQ. Here the aim was to generate specific design ideas for the future mobile app.

As an introduction to the workshops, the participants watched the abovementioned sequence from 'Minority Report' on a TV screen. The first exercise was then introduced and the participants were given time to write down their thoughts on what they considered to be the core values of the ETUQ to keep in a digital version of the tool. The question had a broad scope and could encompass interactions with the client, details on the questionnaire form, and any other associations the participants might generate on the basis of the metaphor. Each association was written down on paper slips and the relative importance of each was then discussed by the participants with the purpose of rating which were more or less important in the development of the app. In cases where there were many notes, the participants grouped the paper slips before discussing the importance of the associated content (see Figure 1).

Figure 2. Inspiration cards for triggering associations in the workshops.

In cases of few associations and paper slips, a set of inspiration cards (Halskov and Dalsgaard, 2006) was used to trigger more associations with the participants (see Figure 2). The same procedure was followed in exercise 2 and 3. For each exercise, the workshop facilitators referred to the fictional narrative to help the participants explain their thoughts on the questions raised and to encourage them to think 'outside of the box' in generating inputs for the future design. The duration of both workshops was approximately three hours. Both authors served as workshop facilitators throughout the workshops.

4.4 Data collection and analysis

The workshops were documented in various ways. A video camera recorded the workshop activities taking place around the table. In addition, a dictaphone recorded the conversations and interactions. The dictaphone was used to document the workshops, but also to let the workshop facilitators focus on the interactions with participants instead of taking notes. The cards filled out by the participants were photographed concurrently. Subsequently, core passages of the sound files were transcribed by an external transcriber. Thus, introductory and closing parts were left out along with affirmative remarks from fellow participants. Further, as the purpose of the analysis was to investigate the suitability of the fictional narrative, the assignment of specific statements to specific participants was not considered important. Therefore, the transcription only distinguished between workshop facilitators, participants and specific workshops, not between specific participants. Below, we identify quotations according to the workshop they belong to, be it workshop 1 or workshop 2. Finally, the transcriptions were meaning-coded (Brinkmann and Kvale, 2014) to identify and characterise the function of the fictional narrative in the workshop exercises. Thus, in the coding process, inputs for the specific ETUQ were less important. Instead, we coded the workshop transcriptions according to different applications of the fictional narrative.

5 RESULTS

The workshops generated many inputs, ideas, comments and criticisms for a future mobile app version of the ETQU tool. We will not go further into these findings here, as our focus is methodical. However, the analysis of the workshop data has provided us with various findings regarding the methodical approach chosen for the workshops. We will report these below.

The workshop participants used the fictional narrative in various ways, as hoped for by the authors. We observed numerous examples of participants using the narrative as a referral in their own ideations, sometimes very explicitly:

'I had a suggestion that when you start the interview, you choose what its aim is. If I'm a clinician and I want the full map. And this is also for later when we have the option of a measure or some kind of more sophisticated report. That you could sort of start by clicking the choice. And this is for the future. But Tom. I'm thinking about Tom' (workshop 2).

Here, the participant is using the narrative to keep herself on track in the discussion about the digitization possibilities.

'I think he was, he had already finished his data collection. I think that was more the data analysis part. I felt that could be me next time!' (workshop 2).

This participant applies the narrative to illustrate different stages of the process of using the ETUQ and to explain how she is using the tool at present and where the digitization could potentially take her work in the future. In the quote, 'he' refers to Tom in the narrative.

At other times, the referential use of the narrative had a more subtle character:

'Yeah in a hierarchy of difficulty. So that you don't need to ask about the easiest thing if the person is quite well-functioning' (workshop 1).

This quote exemplifies how the participant sees the technology as a way to minimise elements of the ETUQ if they are not relevant to the client in question.

'I was thinking maybe a bit ... thinking Tom on this one, then maybe we could have some function where you could, in conversation with the client, prioritise what are the most important things for you to get on with' (workshop 2).

This quote relates to the previous one, pointing to both possibilities of and needs for the digital version of the tool.

Another use of the fictional narrative is for comparison; for instance, when the development of the ETUQ is contrary to the fictional narrative. To exemplify:

'So I was thinking about Tom Cruise's role as very dominant; he did all these things, but in the ETUQ, the subjects, what the subjects tell us, is much more prominent. It's much stronger in the ETUQ' (workshop 2).

During the course of the workshops, it became clear that the fictional narrative had some positive side effects on the interactions in the group. Having the focus removed from the participants, when they went to watch the movie sequence, had a relaxing influence on them. Some laughed or giggled at the look of the main character of the movie (Tom Cruise), while others wanted to keep the cardboard cutout that had been made of the main character after the end of the workshop:

'Hey Tom, will you stay here afterwards or will you bring him back home?' (workshop 2).

What is evident from the analysis of the transcriptions is that the fictional narrative was used to a larger extent among the participants in workshop 2. Several issues may explain this difference. In workshop 2, the participants were direct colleagues and, therefore, perhaps also more familiar with each other. In addition, the majority of their

working focus concerned the ETUQ. To compare, the participants of workshop 1 were not well acquainted in advance, and the ETUQ was one among many other work tasks in their occupational therapy practice. We do not have data to explain the difference in the adoption of the fictional narrative empirically, so we will have to leave the answer to that question to a follow-up study.

6 DISCUSSION

As mentioned in the method section, the current fictional narrative differs from other examples in addressing the form rather than the content of the desired outcome of the workshops. One implication of the difference in focus is a more narrow and solution oriented outcome of the current workshops, when compared to the examples of (Iversen and Dindler, 2008; Dindler, 2010). Thus, both Iversen and Dindler (2008) and Dindler (2010) generate rich and creative design concepts on the basis of their fictional narratives, whereas the current workshops rather generate a discussion of the solution to specific challenges in using the paper based version of ETUQ. One could claim that the focus on the form and not content of the solution as aimed for here is provides a too narrow outcome of the workshops. However, as illustrated by the analysis above, we have seen how the fictional narrative can provide workshop participants with a way of explaining and framing their discussion on a tool, they are already very familiar with.

Further, the nature of the fictional narrative may be discussed. It was clear from the workshops that it came more natural to the participants of workshop 2 to engage with the fictional narrative. The two groups of participants differ as to number (more participants in workshop 2) and background. From our data collection and analysis, it is not possible to identify, whether the difference of engagement depends on the number of participants in the two workshops, the sci-fi nature of the fictional narrative, the different backgrounds of the participants or something different. Further studies are needed to understand how different users apply different fictional narratives in different workshop settings.

7 CONCLUDING REMARKS

To conclude, we have learned that when workshop participants apply a fictional narrative in a design process, it serves as a highly valuable tool for explaining thoughts, perspectives, ideas and the like. Also, a well-functioning fictional narrative can be supportive of social processes amongst the participants (and designers) of a participatory design process.

However, more importantly, we have learned how the same fictional narrative can be used differently by different types of stakeholders or participants in workshops. Despite many similarities between the participants in the two workshops, their uses of the fictional narrative differed. From conducting these two workshops, it has become clear that a fictional narrative design, although concerning the same design process, must be adjusted to the specific stakeholders participating in the design process. Pilot testing is one way to help ensure the active use of the fictional narrative in participatory design. The current study is based on a rather small sample. Further studies are needed to gain a deeper understanding of workshop participants' engagement with and use of fictional narratives, and the resulting design concepts.

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