Participatory Interaction in Therapeutical Strategies

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ABSTRACT

Involving users in innovation processes is important in order to produce sustainable, usable and useful applications and products. However, when working with physically and mentally challenged users, complexity rises to a challenging degree. The approach introduced in this paper, defines the user as a relationship between the staff and the resident of the institution for mentally and physically challenged. The relationship between staff and resident is important in the daily work of the therapists. We show through an example how their work informs our way of understanding an interactive application designed for the Village of Sølund, an residential home for mentally and physically disabled.

Author Keywords

Participatory design, interaction design, therapeutic strategies.

INTRODUCTION

The main scope of the HandiVision project is to develop new methods to involve people with disabilities in the development of better assistive technologies in a crossdisciplinary design process, The project is a 3 year project, supported by the Danish Enterprise and Construction Authority and Central Denmark Region. The project is divided into 4 subprojects, each with their specific focus. This paper is concerned with the work taking place in the first subproject of HandiVision, known as the Sølund project.

At Sølund we are working on the making of an interactive sensory environment which can be transformed seamlessly from being a solely sensing experience, into a special gaming environment for two player action between the disabled resident and the related staff person. The work is done in a multidisciplinary cooperation between staff,

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NordiCHI 2010, October 16–20, 2010, Reykjavik, Iceland. Copyright 2010 ACM ISBN: 978-1-60558-934-3...\$5.00.

residents, architects and designers, innovation specialists,

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and physiotherapists, a music therapist and two companies specialized in interactive technology.



Figur 1: A resident at the village of Sølund interacting with an interactive application developed by Personics - a participating company in the HandiVision projekt

In the following we introduce the process and methods we have used in our work, and describe how work done by the music therapist has informed our understanding of the interactive environment we are currently establishing.

THE RESIDENTS AT THE VILLAGE OF SØLUND

The methodological perspective in the HandiVision project addresses the development of methods for engaging users in participatory design processes. As mentioned above the unambiguous focus of the 'resident-user' understood as an independent participant with the full ability to express needs, ideas and judgments in innovation processes became somewhat meaningless as this notion failed to grasp the core of the methodological problem in the project.

The majority of the residents have severely physically and mentally challenges. The residents can thus not express their opinions on matters including general or imaginative thinking and reasoning. Many residents do not have the cognitive ability to keep attention focused on a given subject matter for a longer period of time. The main methodological question is therefore centered on the problem of how to engage the residents as 'participating users' in the innovation process as opposed to simply being represented by the professional staff and their relatives

Giving the high degree of resident reliance on and orientation towards the staff, it has become quite clear that the focus of attention should rather be on the meaningful *relationship* and interplay between the resident and staffmembers. An approach, that turned the scope of innovation away from an individual user perspective (roughly speaking) to the question of *how to enhance or* *innovate a relationship between resident-user and staff-user.* Therapist and pedagogues were interested in inventing new tools for developing their professional practice. In this respect they became users as well with professional and personal needs and requirements of their own. This is something very different from only expressing needs on behalf of the residents.

At the same time this shift of focus allowed us to bridge the ongoing professional theories and discussions among the professionals at Sølund. Most prominent was the theory of 'Gentle Teaching' and the 'Snoezelen practise'. Gentle Teaching is, in very short terms, a practice striving to encourage the residents to develop their own individual lifepotentials rather than to practice the disciplines of 'normal' behavior. Snoezelen is a therapeutic practice using multi sensory environment to create experiences for the residents. Both theories spring from practice and experiences with resident users.

What characterizes the residents at Sølund is the high degree of individual differences in regard to their physical and mental handicaps. It is in fact impossible to speak of an average resident or even place them on a scale comparing them to children. Some groupings do exist such as the deaf blinds or the sentenced patients placed under 24/24 surveillance. Other residents do have a higher degree of mental, physical and social capabilities including verbalization, however they do not represent the majority of the residents. Many residents have no diagnosis because of the rarity of their conditions or it is complicated by the fact that physical and mental handicaps are often accompanied by a psychiatric diagnosis as well. This challenge made it almost impossible to discuss problems and design with reference to some well-defined group with clear characteristics or to infer from individual preferences and capabilities to other users without actually testing it. And it made it difficult to generalize design solutions to encompass larger groups. Nevertheless, we could use a theory developed by a local music therapist which turned out useful. Not by making a generic profile based on individual characteristics, but by using her theoretical framework to describe and understand the different levels of contact *between* the therapist and the resident. This work is described in the following.

5 LEVELS OF CONTACT

Through our participatory design approach [1], [2] an essential question has been: Which kind of users are we making concepts for? During year 1 and 2 of the project, we had done videoprototyping, ethnographic design work and experimental sessions exploring use of existing technology together with staff and residents. Well into the project as we got to know the staff and residents better, we would ask the staff questions such as; "would this be useful for Peter", or "is it realistic to assume that Mary could do this" in order to get an understanding of the complexity of a concept in relation to the abilities of the resident. However, this communication was based on our common references on an individual basis, and thus not useful in more generic terms to for example make an interactive environment suitable for all of the residents at Sølund.



Figur 2: A videoprototyping session, based on an ethnographic design study by an interaction design student.

In the work of the music therapist, the key issue is not a specific profile of the resident, based on generic terms. Rather, the work is based on the establishment of the contact between the therapist and the resident through communication by music and sounds. The degree of this communication she has described through a theory called "The Five Levels of Contact."





Basically the contact level 1, can not be compared with a relationship between a person and a child in normal development. Reactions and actions seem random and the relationship is primarily based on the assumption that the person is aware of the presence of the therapist. Level 2,3 and 4, are levels that can be compared to the relationship between a person and children in their early development

stages. Level 5 is a way of unfolding oneself in the music. It is a kind of music therapy which can be used in many connections regarding both children (from approx. two and a half years old) and grown ups. The theory is meant to support the different professionals working with disabled people, in understanding how to establish contact and to stimulate and evolve the communication between therapist and the disabled person.

The Butterflygame and the "Five Levels of Contact."

In the following we use the five levels of contact to show how it has been used as a framework to design an interactive application "The Butterfly Game", that can be used not only by "Peter and Mary", but by all the residents at the Village of Sølund.

How it works

The "Butterflygame" application is still work in progress, but is based on the creation of an interactive application that can be used by the residents together with a helper. The application can be used within the five levels of contact, and can furthermore shift seamlessly between a simple sensing experience into a two player "game" based on the movements of the resident and the helper in the room. The application is very simple and consists of a butterfly on



Figur 4: One of the residents at Sølund interacting with the "Butterflygame"

a projected screen. When a "player" moves forward in the room, the butterfly will "fly" away from the player. If the player moves back, the butterfly will move towards the player. If he moves left or right the butterfly will move correspondingly. The projected background can be changed by the staff, so the landscape the butterfly is flying in, is recognized by the resident, for example by showing a picture from the residents' housing unit. Interaction in relation to the "Five levels of contact" We have used the 5 levels of contact as an inspiration in our work with the "Butterflygame."

At contact level 1, the contact between the resident and the therapist is really weak. The reaction of the resident is barely visible or hearable when music is played for him or her. The basic relationship between resident and therapist is in this case a "feeling" of connection described as "when I sense being sensed by you, I assume that you experience being sensed by me" [3]. At this level the Butterfly Game functions solely as a sensory experience consisting of visual and auditive stimulation.

At contact level 2, there are clear reactions on the contact by the therapist. There are reactions which are significant for the specific person, and there is a beginning understanding of the persons self, and maybe especially of the surrounding environment. *The Butterfly Game can be experienced as a response to movements by the resident. When the resident stands still, nothing happens in the application, when s/he moves the "butterfly" reacts. As such, the application contributes to improve the residents consciousness of hers/his expressions related to bodily movement.*

At contact level 3, there are very significant and visible reactions on the approach by the therapist. A person at level 3 is very conscious about his/her own ability to make something happen and to get the attention of the surroundings, but does not understand the basic communication rule of my turn/your turn. *At this level, the Butterfly Game supports the resident in his/her ability to take initiatives and to interact with other people, and it stimulates the understanding of action/reaction.*

At contact level 4, the interplay is a conscious act by the resident. The therapist and the client can take turns making sounds and listening. The client is conscious of the basic rule in communication – taking turns. *In the Butterfly Game application, this level is addressed by the possibility of the therapist to introduce his or her own "butterfly" in the game and thus "fly" together with the resident. In this mode, the application supports the relation between the resident and the therapist in a direct way somewhat similar to musical dialogues.*

At contact level 5, the resident has a clear understanding of him/herself in interplay with the surroundings. Often there is a (limited) verbal communication. However it can be whatsoever short and abrupt. *At this level it is possible for the therapist and the resident to game together, for example by playing "follow the leader" or similar games.*

Contact level	Sensory experience	Single interaction	Two – player interaction
1	Х		(X)
2	Х	Х	(X)
3	Х	Х	(X)
4	Х	Х	Х
5	Х	Х	Х

Table 1. Relationship between contact levels and interaction. The parenthesis around X "(X)" indicates that at contact level 1-3 the therapist/helper can use the two-player interaction mode as sensory input and stimulation, but not to "game" together with the resident.

CONCLUSION

To involve users in designing interactive environments is a complex task when the end-users are mentally and physically disabled. The process addresses both practical and ethical issues. If the end-user lacks the ability to express even simple needs and wishes in common language, there is a need for careful interpretation by the surroundings. The daily helpers and therapists are naturally the best to do this. However it is important to state, that the residents at Sølund have a language. Even at what the music therapist Anne Steen Møller defines as contact level 1, it seems meaningful to state that there are glimpses of communication.

In the Sølund project, we have tried to involve the users, as individuals participating in relations with their helpers/therapists. The helpers/ therapists are the interpreters/advocates for the resident in the process. We have tried to involve users directly by using "<u>off the shelf</u>" interaction devices such as e.g. the Nintendo WII and the Personics System. Also, we have worked with functional prototypes as the e-tracker in order to get direct response from the users.

A major concern from the involved companies has been the wish for having 3-5 user profiles, from which we then could define and produce a final application with them in mind. However, in this process we have found it much more useful to utilize the resources and reflections available. Thus using the work done by the local music therapist, together with workshops, field studies and visits together with staff at Sølund, provided a framework which has led to an application that can be used within the therapeutical structure already in use.

The collaboration with the helpers and therapists and the insight obtained in their daily work highlights personalization and flexibility as key issues in their contact with the residents at Sølund.

In other words there are basically 3 lessons to be learned:

1) Prototyping is essential for involving users in therapeutic contexts due to the low abstraction level of mentally challenged. The concrete and socially engaging approach is simply the only way to gain first hand knowledge of the residents.

2) The residents at Sølund are highly individual users, indicating that typical user profiles are difficult to put into use. Attunement to practical and theoretical assumption and ongoing discussion in the field has been crucial. But most importantly is the rich resource of the personal relationship between residents and caregivers

3) Flexibility and personalization reflects the relation between therapists and residents. It should be build into the design of interactive applications as to enhance personal appeal for the residents and give the therapist the professional means for bringing variations into their practice.

ACKNOWLEDGMENTS

We thank the staff and residents at the village of Sølund for their engagement in the work, and for the disposal of facilities for workshops and prototyping. Also thanks to the Danish Enterprise and Construction Authority and Central Denmark Region for supporting the work in the HandiVision project.

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