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Two design cases of social network for parents in the context of premature birth

Abstract

We present two demonstrators of interactive and networked systems. The context of both systems is premature birth, the neonatal intensive care unit and the social situation of the parents. Both demonstrators establish a link between the physical and the digital and both take advantage of contemporary developments in social computing. The first demonstrator is called Touchee. The second demonstrator is called NICU-tree.

Keywords

Social computing, neonatology, interaction.

1 Context: premature birth

When a baby is born after a pregnancy of 37 weeks or shorter it is said to be premature (Chen, Feijs, & Bambang Oetomo, 2010). Premature and ill neonates are to be treated in a special clinical environment, called the NICU (neonatal intensive care unit). In the NICU, the neonate is treated according to evidence-based therapies in which modern technology plays an important role. Continuous monitoring of health parameters is crucial for premature infants (Ahn & Kim, 2007). However, the equipment tends to separate and alienate the parents and the baby and interferes with the holistic care of the newborn (Miles & Holditch-Davis, 1997; Aagaard & Hall, 2008). Researchers at TU/e[1] and MMC[2] are contributing to improving the experiences in the NICU, as well as more bonding between parents and their babies (Chen, Feijs, & Bambang Oetomo, 2010).
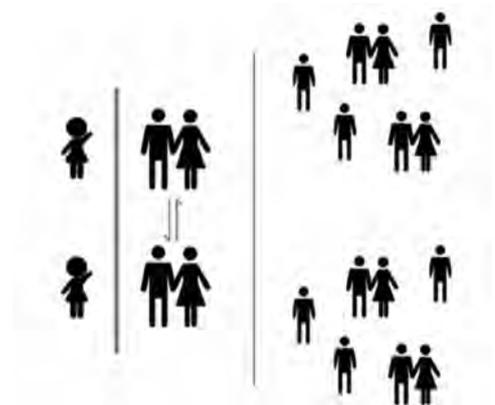

Fig. 1. Parents, peers, relatives and friends.

So far, less attention has been given to the relationship between these parents and their relatives and friends. Moreover, there is a strong need for this group of parents to exchange more experiential knowledge, next to medical knowledge. This opens up opportunities for exploration by design. In Figure 1 we show the babies, their parents and this next layer of relatives, friends and peers.

2 Inspiration from social computing

In many countries, there is already some form of organisation by the parents (and external parties).

[1] TU/e is short for Eindhoven University of Technology

[2] MMC is short for Máxima Medisch Centrum Veldhoven

For example, in The Netherlands, there is the VOC (Vereniging van Ouders van Couveusekinderen) with the aim to bring together the experiences of parents with premature babies. A board, bi-monthly magazines, a website, a forum and offline gatherings form the backbone. We believe it will be interesting to see what social computing could offer additionally. In Figure 2 we present a more elaborate network of relationships between various relevant stakeholders and institutions. With fast developing web technologies like SNS (Social Networking Service), information gets spread with less time and space limitations.
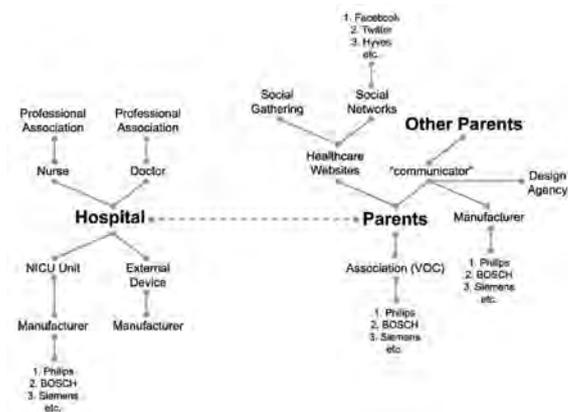

Fig. 2. Relationship between different institutions

Still, the major objective of present SNSs is to connect with people who you know already. Yet in the premature-context, the relevant group of people is more dynamic, even within a short period of time. Therefore another method of connecting (new) people should be proposed to meet this need. Pooling is a system in which people share information grouped by their (sub-) cultural values (Straub, Loch, Evaristo, Karahanna, & Strite, 2002). A similar example can be found at www.atthepool.com. Besides, in our field research, we discovered that parents do keep a diary about their babies together with any meaningful objects to associate with certain piece of memory. Thus we take keeping-diary-behaviour as an initial point to start designing within their natural flow of daily ritual.

3 Design concepts

Two important subjects emerged from previous investigations: 1) how to stimulate higher level of both information and emotion exchange between parents with premature babies; 2) how to involve relatives in the recovery process by sharing proper information. We propose two different concepts, Touchee and NICU-tree.

3.1 Touchee

Fig. 3. Overview of Touchee interaction components

Touchee embraces both online and offline activities. There are two major components in the system: 1) a mobile digital device in the NICU room; 2) an interactive platform in common areas in the hospital as shown on the left part in figure 3. A cloud system and a third-party collaboration of materialization are supporting in the process. Every piece of digital memory generated in the NICU room by the parents of pre-term babies is stored in the cloud, which can be accessed again with personal mobile device outside NICU room. This data (represented on a personal mobile device) together with an object from the hospital that the parents would like to combine into a holistic recollection, users can place them on the interactive platform and create a corresponding atmosphere. All the data will then be transferred to a third party materialization service where a container with meaningful shape is realized and delivered directly

to the applicant. In this manner, the combination of materialization of digital data with tangible-memorial object form a comprehensive media between the parents or even at a personal level.

While parents take efforts and spend time in designing their own gadget, there is much room for them to come across with other parents where communication happens. Furthermore, this gadget serves as a trigger at the beginning of connecting parents that a tangible object imply much more emotions than digital information. In this way, parents are bonded in a physical environment when possible, supporting by the pooling technology to group similar parents together.

3.2 NICU-tree

NICU-tree is a diary based socialization system designed especially for parents with premature babies. The system can be accessed in three ways: 1) a digital device in a NICU room with beamer and camera functionalities; 2) a large public display/ projection in every hospital throughout Netherlands; and 3) a personally owned portable digital device. A cloud system supports all the accessibilities. Each piece of dairy and related comments has a unique QR code where users can scan and download corresponding information. The interaction structure of NICU-tree is shown as figure 4.
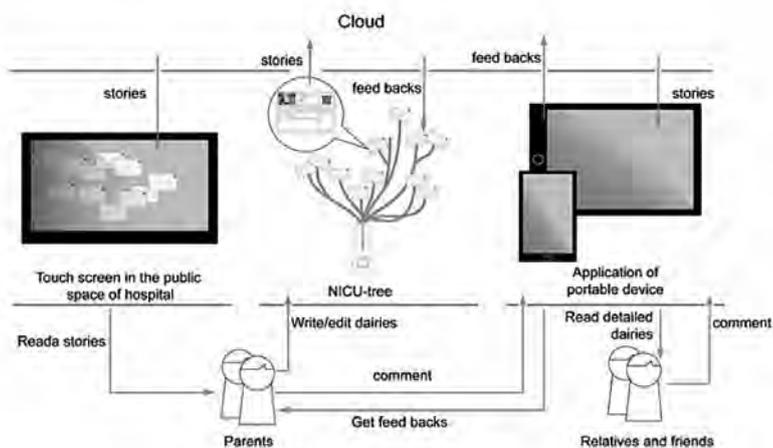
Fig. 4. Structure of NICU-tree

Different from writing a diary, parents use their mobile devices to record moments instantly and upload to the cloud. Every piece of information uploaded will be made

into a physical card that can be attached onto walls in NICU rooms. The camera of the host machine will track the location of this card and project a "branch" between itself and the card, growing into a tree gradually. At the same time, this information will be available on those public displays where other parents/ relatives can scan the QR code and interact with it, which will be reflected on the projection in the NICU room.
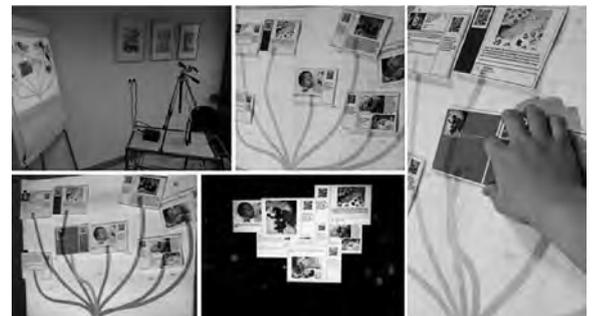
Fig. 5. Setup of NICU-tree for evaluation session

Privacy protection is also well-considered in this concept that by default, all posted diaries are private. Only after the user chooses to disclose certain piece of diary publicly then it will be shown in the public display. Besides for each of the diaries, parents can choose who to share with, that only relevant relatives or friends would receive notification. In all, privacy concern is among the top issues to tackle in this proposal.

4 Lessons learned

The evaluation session was taken place in MMC where ten participants from both MMC and RMH[3] attended. Genders were balanced to the degree possible, with two men and eight women. The babies of three of them are currently kept in the NICUs in MMC. Five of them are volunteers working in RMH, among which one mother had a pre-term baby in January 2012 who recovered well from illness. Two are experts in the field of neonatology.

After evaluating two design concepts with (potential) parents, the feedbacks confirm the potential of both systems in terms of facilitating deeper communication and interaction between parents. On the virtual level, modern technologies lower the barrier of creating, storing and sharing information, which is crucial in a stressful condition. On the tangible level, objects do

[3] RMH is short for Ronald McDonald Huis, Zuidoost-Brabant branch to be specific

stimulate a more profound emotional exchange that helps to build a robust relationship/network between parents. Therefore it could be meaningful to combine two systems in the next step.

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