A Design Case
– Designing with patients and medical professionals

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A Design Case – mediPal
Background to the Case

- Consultant work :: Usability Designer. Spent approximately 190 hours in the project, during six months.
- Design for people with special needs.
- Interaction design for a handheld computer:: PDA.
- An early version (Beta) of the system was already developed and tried out by a couple of users.
- Focus on the UCSD process from a consultant perspective.
Objectives for the Medical Friend – mediPal

• A PDA to support and help people with chronic diseases, such as Parkinson, to better manage their day-to-day life; “give them a better way of living”.

• A reminder – tells the patient when to take medication.

• “Tunes” the medication; number of pills, strength, etc.

• The system collects data and gives feedback. Helps the doctor to give better treatment.

• Always around, day and night.
Living with Parkinson’s Disease

• People living with Parkinson’s disease are “stuck to a tight schedule”. Their lives are “controlled” by medication.

• The conditions get worse over time, and the medication becomes more and more important. In the beginning they take pills every 6th hour, later every 2nd hour.

• Daily routines are important: exercising, eating at regular hours, etc. Also what they eat is important, e.g. avoiding protein (interacts with L-dopa).
Designing for a PDA – Implications on Design?

• The way you interact.
• Availability, accessibility and mobility.
• The limited space on the screen (240 by 320 pixels) and physical size.
• Comes with other expectations, compared to PCs: handheld and small.
• No traditional keyboard.
• Touch sensitive screen.
• Runs on battery.
• The development environment, database, performance, etc.
What was the Problem, My Assignment?

• Make it easier to use!

• Wanted it to be perceived as a ”serious” product...

• ”We know that we have all the functions needed, make it look nice”!
Existing Version...
Problems in the Earlier Version

- Users didn’t feel in control. They “got lost”. Structure and interaction were not very usable.
- Some long interaction sequences and even illogical sequences, e.g. when attending to a alarm.
- The aesthetic design was defective, e.g. background images, color scheme, size of buttons. Lead to, among other things, unnecessary cognitive problems.
- Users didn’t have a good enough overview of events. Could not foresee the next couple of activities.
- Etc...
Project Team

- Nurse – specialised in Parkinson
- Usability Designer
- Technical project leader
- Developers, 2-3
- CEO – responsible for the product

No experience in user-centred activities or usability...
The Process :: Lightweight and Tailored UCSD

• Review of all points of view that had come from different stakeholders, including early users.

• Analysis of all screens and dialogs.

• User interviews.

Report – analysis report

• New design phase – paper and pencil, sketches in a drawing program.

• Evaluations with users.

• Continued design – prototype on the PDA.

Report – design report
User Profiles – How We Used Them

• Goal: to focus the team on users and the usage of the system.

• Gathered data, mostly already known “facts” provided by the nurse.

• Fictitious characters (patients), but with real attributes.

• We did put them on a wall in our project room.
Process :: Analysis of Dialogs
Studies of User Using an Early Version

- Interviews
- Evaluations
- Gathering data
Process :: Design
Example :: Evaluating a Paper Prototype

• We used a paper prototype together with the PDA. We took the paper sketches and designed them in a drawing program. Then we printed the “windows” on cardboard paper, and cut them to fit the display of the PDA.
Challenges in Applying UCSD

- Usability versus business goals.
- “Build” an understanding of what UCSD is and that it needs special procedures and a “special attitude”.
- Tell the management that a product is not ready just because we have a prototype!
- To really work iteratively.
- Access to users.

The user groups :: their requirements and special conditions.
UCSD Had a Major Impact

- We did not just change the look of the system. We eventually changed the whole interaction (dialog), and also altered quite a lot of the functionality. The usability focus and the UCSD approach had a much greater influence on the re-design than anyone could foresee.

- The managers at the product company were surprised that the re-design had such a great impact on the system. What they expected to be a minor “face-lift”, turned out to be a major make over.
Example :: Final Design of ”Main Page”

**Shallow interaction structure.**

**A balance between logical steps and swiftness.**

**Simplicity.**

- **18.00**
  - 1 tbl Madopark Depot 25mg
  - Mobility
  - Physical activity

**Work task selector.** Icons for now, essentially to save space

**Area for leading symptoms**

**Diary**
- 12.02: 1 tbl Madopark Depot 25mg
- 13.55: 1 kopp kaffe
- 14.10: 1 tbl Madopark Depot 25mg

**Agenda**
- 1 remainder missed
- 16.00: 1 tbl Madopark Depot 25mg
- 17.30: Mobility
- 18.00: 1 tbl Madopark Depot 25mg
- 19.30: Mobility
- 20.00: 1 tbl Madopark Depot 25mg

**Spontaneous registration**
- Mobility
- Pain
- Others...

**Puts up a “on-hold” screen**

**Holding down the pen at a remainder generates an information view**

**Puts up a screen to set time**
What Can Be Learned :: Process

- The tailoring of the UCSD process was necessary. We could not have pushed harder for a change in the company’s development practices. We realised that it had to be a step–by–step process, changing the work practices for the team members as well as for the managers.

- Having the usability designer leaving the project right at the start of the construction phase was a logical decision in the managers’ eyes, but resulted in a lack of user and usability focus during this phase. This was reported numerous times by team members in later communications. The usability design and championing aspects can never be overrated.
What Can Be Learned :: User participation

• It was a great advantage to work with people who know the domain and the user characteristics thoroughly. In this case the relation between the nurse and me (the usability designer) turned out to be fruitful. We complemented each other in knowledge and experience, and worked efficiently together.

• The team managed to focus on usability, e.g. via the usage of a persona, but we did not succeed in having active user participation.

• We spent too little time with users.
What Can Be Learned :: Design

• The design phase, with dedicated activities for going through conceptual design, interaction design, and lastly detailed design, was considered a good approach.

• The adaptation of the workspace metaphor (a design pattern) to the small format of the PDA was a challenge, but turned out quite well.

• The evaluation of the prototype with paper windows used on top of the PDA was seen as an elegant and effective way of carrying out the usability evaluation.
mediPal as a Product

How did the mediPal system succeed as a product? The commercial introduction of the product has for various reasons been postponed, and mediPal was sold to another company. So, it is hard to say if mediPal will really help people with Parkinson in the future or not; it is unclear at the moment.
Afterthoughts...

Working with users that have a chronic disease such as Parkinson does inevitably have an effect on what you are doing. You get emotionally involved, but exactly how this affects your job is very hard to tell.

I like to think about it as the practitioner being humbled by the experience, trying to do his/her very best, and even adding a little bit extra without thinking about it.
Ten Years Later...

[Images of two screens from a mobile application named "medipal"]

- Svara på frågor
- Mina registreringar
- Om Medipal

On the right screen:

- Ask in Swedish: "Hur sov du inatt?"
- Rating scale from "Väldigt bra" to "Mycket dåligt"

 tussen Cil & Hjälp
Great Usability Resources

- www.usability.gov/
- www.usabilitybok.org/topics

10 Usability Heuristics for User Interface Design

- www.nngroup.com/articles/ten-usability-heuristics/
Thank You For Cooperating!

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