To practice UCSD – Usability Design

Usability Design – from principles to process

• Adds essential UCSD activities and roles to any process.
• Easy to communicate.
• Easy to integrate: in organizations and projects.
• A subset of a development process.

Usage example
Plan the UD process

- Must also be an integral part of the overall project planning.

**Usability Design Process**

- **Requirements analysis**
  - User profiles
  - Contextual inquiries
  - Use cases
  - Business objectives

- **Usability Design**
  - Usability Design Guide
  - Evaluation
  - Implement design

- **Deployment**
  - Introduce
  - Operate
Contextual Inquiries and User Profiling

- Background: electrician, maintenance/process technician
- Mostly Electrical applications
- Some also do mechanical applications and process dependent applications
- Problem identification/solving (70%)
- Regular maintenance (30%)
- Uses camera in the facility where he works or travels to different sites: schools, hospitals, goes to stations, holds, etc. (for power problems, fire prevention)
- Mostly indoors, very little office work.
- Uses the camera ~10% of work time.
- Uses other tools: screwdriver, pliers, amperemeter, etc.
- Some also carry protocol/notepad
- For regulatory reasons: certificates/training can be mandatory in some cases.
- Quick and efficient for finding problems that avoid otherwise take more time.

Functionality Needed in Camera

- View image
  - Focus zoom
  - Change color scheme (palette)
  - Use color filter - above/below
  - Use color filter - on-off
  - Use user filter
  - Mount camera in tripod (paddock)
- Measure temperature
  - Measure "correct" temperature
  - Find hot bulb/bulb temperature
  - Measurement: accuracy - adjust emissivity (paddocks)
- Store image
- Manage stored images (view/delete)

Focusing on users
Turn requirements into design

- Design criteria are complementary to usability goals.
- As we iterate through analysis, design and evaluation we learn more about what kind of design that will work best.
- Design criteria is an “aid” to design for usability.
- These criteria are derived from user profiles and work tasks, and gives the direction for the design (layout and interaction).

Design criteria, an example

- **Image size.** Make the area for images as large as possible.
- **Minimal user load.** Make the handling of the application as easy as possible. No extra load should be put on the user. This includes short access paths to functions and minimized navigation paths within the application.
- **Work oriented.** The application should map (support) the actual work situation (work flow) and domain to further minimize the mental load.
- **Support multiple user levels.** The same application should allow both novice and expert users to gain maximal usability. There should be no expert mode needed.
Design criteria, an example

**Design criteria:**
1. Fast scanning of content.
2. Easy and direct access.
3. Overview.
4. Support the average user.

**Design decisions:**
- No navigation through menus. *Supporting criterion 2.*
- Fixed and static layout. *Supporting criteria 1, 2 & 3.*
- Clean layout without unnecessary graphical effects. *Supporting criterion 1.*
- Focus on content. *Supporting criteria 2 & 4.*
- Restricted use of metaphors, use only when appropriate. *Supporting criterion 4.*

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Usability Design Guide

**Example TOC**
- Customizing the usability design process for the project
- Plan for user participation
- Overview of the system – goals and functionality
- User profiles and/or personas
- Contextual task analysis
- Platform capabilities and constraints
- Usability goals
- Design decisions and criteria
- Usage scenarios
- Conceptual design
- Interaction design, navigation and information structure
- Detailed design
- Design artifacts
- Feedback and evaluations
Usability Design Process

Usage Scenarios

User role: Laboratory staff.
Priority: 1
Context: The user wants to prepare the solution for a particular step in an activity, for example Fresh Solution in 1D. The user does not know how to prepare the solution but knows in which activity the System is used. She needs to find the recipe, make the solution and then use it.

Another common situation is that the laboratory staff wants to prepare different solutions in advance. They may start prepping all solutions for a certain activity, and continue with all solutions in the next activity. An example is when a C2D Buffer has been started, and laboratory staff is going to make the solutions for staining (next activity in the workflow).

Issues for the prototype: The user starts with searching among all chemicals etc. Criteria may be short name, long name, application field, type of chemical and activity. Information displayed in the result list is the short name. When selecting the name, a view containing information of the solution is displayed. From this view it is now possible to enter information about this specific solution and create bar code for the new item and register it.

Preparation of the solution

Scenarios – User stories

- Current work situation
- Elicit requirements
- Future usage

PREPARE THE SOLUTION

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Conceptual design

• Abstract description of the overall concept.

Refined conceptual design
Interaction design

- Interaction sequences, information architecture, the dynamics, navigation, menus, etc.
Interaction design – example of navigation structure

Interaction design | structured information architecture

Navigation with work task buttons

ATC

10/6/09
Detailed design

• Exact placement, accurate components, colors, fonts, graphics, etc.
Prototyping

Prototyping – going from simple and comprehensible paper sketches to a completed system.

Prototyping – low fidelity
Prototyping – high fidelity

Prototyping – Quick and efficient

• Visual Basic prototype...
Participatory prototyping

User profiles
Personas

User

User

User

Drawing area

Usability Design Process

Requirements analysis

User profiles

Contextual inquiries

System goals, design criteria and usability goals

Usability Design Guide

Usage Scenarios

Conceptual Design

Mock-ups

Evaluation

Goals met?

Yes

No!

Yes

No!

Yes

No!

Usability Design in Systems Development

• User Focus
• Active user involvement
• Evolutionary development
• Simple design representations
• Prototyping
• Evaluate use in context

Driven by the Usability Designer

Active user involvement

Growing software with iterative design

Deployment

Introduce and operate

Needs analysis

Usability Design Guide

Detailed Design

Evaluation

Goals met?

Yes

No!

Yes

No!

Yes

No!

Yes

No!

Yes

No!
Usability evaluations

• Preferable in users’ natural work environment.
• Powerful when seen as a part of the explorative process of finding (inventing) solutions.
• It’s an interaction between analyzing the problem, seeking solutions to the problem and evaluating solutions.
• Evaluations as a tool to explore the design space and learn more about possible solutions.
• Possible to combine field studies with evaluations.

Out in the field, meeting users
Evaluation – mock-up example

Evaluation – example mock-up and paper
Usability Design Process

To deploy and introduce a system

- Critical to the success of the system.
- Usually gets too little attention.
- Must start when the project starts.
- Involves: organization, work processes, work force competence, etc.
- The system owners must be involved from the start of the project.
- Education and support.
- Use “ambassador users”.
Ett fall ur verkligheten

Ett användarcentrerat projekts uppgång och fall

• Riksskatteverket (RSV) genomförde som en pilot ett in-houseprojekt för att utveckla ett nytt datoriserat ärendehandläggningsstöd för handläggarna som arbetade med folkbokföring.
• Projektet hade en uttalad målsättning att tillämpa en användarcentrerad systemutvecklingsmetodik.
• Baserat på tidigare erfarenheter visste man att om man bara lade till användbarhetsmetoder i den existerande processen så skulle man inte kunna åstadkomma någon förändring.
• Vi etablerade en uppsättning principer för användarcentrering som vi skulle tillämpa i det kommande pilotprojektet.
Ursprunglig uppsättning principer för ACSD

- Låt användarnas arbetsrutiner styra utvecklingen.
- Aktiv användarmedverkan genom hela projektet.
  - Verksamhetsexpert (kontinuerligt genom hela utvecklingsprocessen)
  - Och verkliga slutanvändare (för utvärdering av åtskilliga designresultat)
- Tidig prototyping för att utvärdera och utveckla designlösningar.
- Kontinuerlig iterering av designlösningarna.
- Tvärdisciplinära designteam.
- Integrerad design.

Aktiviteter

- Användbarhetsdesigner.
- Användar- och uppgiftsanalys.
- Personas →
- Deltagande prototyping med användare.
- ...
- Kvalitetssäkringsplan.
- Stöd för införandeprocessen.
- ...
- Det är aldrig för sent att ge upp.
Problem

- Inget eller begränsat livscyklelperspektiv.
- Användbarhetsdesigners ignorerades.
- Amvändningsfallshysteri.
- Begränsad förståelse av dokumentationen.
- Förändrad teknisk plattform.
- Problem att etablera en användarcentrerad attityd.

Vad lär vi oss av detta?

- ACSD uppfattas inte lika överallt eftersom det saknas en gemensam enhetlig terminologi
- Man måste vara väldigt tydlig med vad man menar med att en process skall följa ACSD.
- Kommersiella processer hjälper oss inte särskilt mycket i detta.
- Våra principer för ACSD behövde modifieras.
- Alla deltagares och avnämares stöd är av avgörande betydelse.
- ACSD är inte starkare än sin svagaste länk.
- I sluttampen handlar allt om attityd...