## **Contextual Inquiry in Practice**

### **User-Centered Design**

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## **Contextual Inquiry**

### Collection of detailed information about customer

- Observing and interviewing the user while they actually work.
- Stay in the background and let the user lead the situation
- Forming a partnership with customer.
- The goal is to understand how and why something is done or why something is not done.
- Contextual inquiry comprises preparation, evaluation, analysis, and design phases.

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## **Setting Project Focus**

Initial project focus will usually be too narrow and restricted

→ Expand the focus beyond tool use to see the whole work context and indentify opportunities.

- Guide in thinking about how the system fits into customers' overall work
  - What is the work we expect to support?
  - How does this work fit into the customer's whole work life?
  - What are the key work tasks?
  - Who provides the information needed to do job, and work happen physically?

### **Broaden your focus to include the whole** work process !!!

## **Setting Project Focus**

To expand your perspective on the work, look for metaphor for the work

- Metaphors give you insight into the work you are supporting, suggesting hidden aspects that might be important.
- Use the metaphors to structure your thinking, and conduct interviews in the metaphor's work domain of it would be useful to know how it really works.

Study analogous work to stimulate insight into how work is structured !!!

### **Designing the Inquiry for Commercial Products (1/3)**

### Design a known product

- Gather data on people using competitive products
   Must meet the market expectations they create
- Gather data on the basic work practice of the market
- Use your existing customer feedback channels to help set your focus
  - Reveal what aspects of work are currently not well supported
- Designing your product to support these unmet needs will differentiate your product from the rest of the market

Look for the new delighters : the unrecognized needs !!!

### **Designing the Inquiry for Commercial Products (2/3)**

### Addressing a new work domain

- There is no way to study it !!!
- Define the work your new system will replace, and study it to learn what matters and how it is structured.
  - The market can make the transition to your new products.
- Define the intent people are trying to achieve.
  - Gather data on people achieving their intent with current tools
- Use metaphors to think about what may be important in new work domain.

### All work is already being done some way; study it for clues !!!

### **Designing the Inquiry for Commercial Products (3/3)**

### New technology

- Design alterations to existing products to take advantage of new technology or discover whole new markets.
- Look for analogs of the technology and how they are used in the real world.
- Look for the underlying metaphor of the new technology and study that.
- Go to the places where the new technology can make a difference to stimulate your thinking about how it might be used.

### Build on how analogs of the technology are used in the real world !!!

## **Designing the Inquiry for IT Projects**

### Upgrade

- A part of "maintenance"
- Look at the whole of the work task and related tasks to understand how the change affects the work as a whole.
- Look at detailed too use to see what UI mechanisms work and which get in the way.
- Look for other point requests that can be addressed with the same mechanism.

## Look at tool use and its edges to extend the system !!!

## **Designing the Inquiry for IT Projects**

### New Systems

- Expand your statement of focus by looking at whole work process that the original request is a part of.
  - How does it support the real work of the department?
  - Is the process contained in one department, or does it span department?

Ask: how will the new system support the real work of the department ?

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## **Designing the Inquiry for IT Projects**

### Process redesign

- The focus for the project needs to look at the customers of the new process
  - □ What do they need, and why?
- Look at how the work is accomplished now
  - What have people had to do to make the process work?
  - What will get in the way of introducing a new process?

CD develops the details of business process redesign !!!

## **Designing the Interviewing Situation (1/4)**

- Key questions for defining the interviewing situation
  - How do I get close to the work?
  - How close can I get?
  - How do I create a shared interpretation with the customer?

### Different kinds of tasks make different demands on the interview

- Normal, Intermittent, Uninterruptable
- Extremely long, Extremely focused
- Internal

## **Designing the Interviewing Situation (2/4)**

### Normal

- Writing a letter, delivering mail, install software, and writing code
- Use a standard contextual interview
  - Useful to ask the customer to save work of the sort you want to study to do during the interview

### Intermittent

- An intermittent task happens at rare intervals
  - Cannot be scheduled and does not last long
- Create a trail to walk and talk with the user
  - It will enable the user to re-create a retrospective account of the event.

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## Designing the Interviewing Situation (3/4)

### Uninterruptable

- Some tasks simple cannot be interrupted
  - Surgical operation, high-level management meeting, and sale call
- Plan discussion breaks between events
  - Participants can discuss what happened in part of meeting just concluded.

### Extremely long

- Some tasks years to complete
  - Shipping a major software system, developing a new drug, and building a 747
- Create interviewing situations that reveal a cross section of work
  - Since work strategy repeats, common patterns will emerge even though the case are different.

## Designing the Interviewing Situation (4/4)

### Extremely focused

- The problem is focused on the minutia of a person's action
  - It' too hard to run a standard interview
  - You would miss too much if you interrupted every moment
- Videotape and interpret with the user
  - **I**t will capture the details you would miss
  - You should see with the user because you cannot understand all their motivations

### Internal

- The inquiry needs to focus on internal mental process
- Use ongoing observation with lots of interruption
  - Make a lot of hypotheses about what the customer is taking into account in their thinking.

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## **Deciding Who To Interview (1/2)**

- Interview customers whose work is as different as possible.
  - Diversity in work practice usually is not equivalent to diversity in market segment.
    - Financial institutions, high tech, and retail → office work is done similarly in any modern corporation
  - Look for
    - Different business strategies Employer vs. employee
    - Cultural differences Trucking company vs. high-tech company
    - Different physical situation a company distributed across several states vs. a company located at single site
    - Differences of scale small business vs. large corporation

## **Deciding Who To Interview (2/2)**

### Let focus changes drive customer selection

- Important client who has to buy into an internal project
- A pithy focus statement keeps the interview on track
  - An Inquiry into the work that the project supports will yield lots of detail about the work and what to look for
  - Focus statements are best when they use simple language.

## Conclusion

### **Making IT Work**

- The crucial first step is to ground the design in relevant customer data.
- This presentation has given you a solid grounding in the basic of setting up and running a successful interview.
- A few interview will return a wealth of data on the customers you serve and the work they do.
  - Customers feel like they are being listened to the first time, and the sales force and marketing soon come to recognize the benefit.

## Customers feel heard and valued after an interview.

## Kiitos !!!



## Work models

### Flow, Sequence, Artifact

Juho Jantunen Mikko Savolainen

## What are Work models?

Work models describe the way the work is done in an organization build by the point of views of individual persons not intended to represent everything that an organization does Every model describes the work from a different aspect

## Flow model

The flow model describes people and their responsibilites, the communication paths between them and the things communicated how the work is divided and coordinated It is used to create a "Bird's eye view" of the organization

## Flow – things to look for

### Coordination

- What artifacts/information are being handed on and received?
- Where did it come from? Who created it? Where is it going next?
- What problems are there in the coordination?

### Strategy

- How do people see themselves in the organization?
- What do they consider to be their contribution to the company?

### Roles

- What makes a coherent role?
- Which tasks require similar knowledge, tools etc. ?

## Flow – creating a model

- People are bubbles including their position and responsibilities
- Flow is indicated as arrows between bubbles, with the kind of communication written on the line
- Artifacts are boxes on the flow-lines
- Informal communication is written on the line without a box



## Sequence model

Describes a sequence of actions for an individual person to achieve an intent
 Represents the steps by which a work is done, the triggers that kick off these steps and the intents that are being accomplished

## Sequence – things to look for

Watch people work and collect sequences
Look at what people do and how they do it
Capture actions at a level that is relevant

but it's safer to get more detail rather than less

When designing an interface, look at eye movement, hand movement, hesitations, etc.

## Sequence – creating a model

Intent defines what sequence is trying to achieve Trigger describes the reason causing the sequence Steps represent what actually happened and are combined with arrows



## Artifact model

Things that people create, use and modify in their work are artifacts

- They might be to-do lists, documents or other physical objects
- An artifact model is a drawing or photocopy of the artifact and a description of its use

## Artifact - things to look for

### Structure

- All artifacts have structure, even if they are started from a blank page
- How does the presentation reveal the structure?
- How is the information grouped?

### Information content

- Specific to the work, that the artifact carries
- Look for the information the artifact carries and how it is used
- Why is the artifact appropriate for this information?
- Can you make the information available more simply in your system?

## Artifact - things to look for

### Informal annotations

- are a gold-mine of information
- tell about the actual usage of the artifact
- Was the defined structure used or extended?
- If the artifact didn't match the work, can you make your system fit the work better?

### Presentation

- Look for the formatting, layout of parts on the page and the use of white space
- How does the artifact attract attention to some parts of the content and downplay others?

## Artifact – creating a model

- Information presented by the object
- Structure of the parts
- Annotations indicate the informal usage of the object
- Usage of the artifact (how people move trough the parts of the artifact)



structure and intent of things used in work

## Relations of Work models

Artifacts are manipulated in the sequence models and passed between people in the flow model

The tasks of the persons in the flow model can be described with the sequence model

## References

 Contextual Design: Defining Customer-Centered Systems by Beyer and Holtzblatt
 Contextual design presentation by Penelope Sanderson & Tania Xiao <u>http://www.achs.org.au/pdf/tue.ws5.sanderson.pdf</u>



### Cultural model & Physical model

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1

IMPIT-2008 Chuzhanova Tanya Kuanyshpayeva Damira

## Cultural model

The cultural model helps define expectations, desires, values, and the whole approach people take in their context. As it provides an in-depth understanding of potential user groups and the way to communicate to them, the cultural analytic model is critical to innovation with symbolic meaning concern, while it is not as important to innovation with usability concern.

**Cultural model:** constraints on the system from organizational culture



# Successful systems fit with their customer's culture

If a system conflicts with its customer's self-image, or doesn't account for the constraints they are under, or under-cuts the values important to them, it will not succeed.



## Culture is as invisible as water to a fish

The cultural context is to us like water to fish - pervasive and inescapable, yet invisible and intangible. Cultural context is the mindset that people operate within and that plays a part in everything they do.



## The cultural model makes influences concrete

The cultural context includes the formal and information policy of an organization, the business climate created by competitors and be the nature of the business, government requirements, and so on. Culture influences work by altering the choices people make.



## Recognizing the influence of culture

• Tone.

A valuable system helps people be who they want to be.

Policies.

A valuable system makes conforming to policy easy.

• Organizational influence.

A valuable system reduces friction and irritation in the workplace.





## An organization's culture is not reflected in its organization chart

Cultural models do not map to organization charts. They show how power is experienced by people, rather than the formal power of the organization.



## The physical model

The analysis of physical model helps better understand the physical context of the potential user and the product or service. The understanding of physical model is important to all innovation situations. It helps define both the constraints imposed by the physical environment and the structure people create within those constraints for their purposes.



## **Physical model:** physical structure of the work, e.g. office layout



# The physical model reveals design constraints

Any product or system must live with the constraints of the physical environment as it exist.



### Model both site and workplace

Studying the workplace offers important clues to the way people structure and think about work. People restructure their workplace to support doing work in the way they prefer, to the extent they can.



## People reorganize their environment to reflect the work they do

The physical environment affects how work is done at every scale: the multiple sites and their relationships to each other, the structure of a single site, and an individual's workplace.



# Seeing the impact of the physical environment

### Organization of space

Planned space reflects organizational assumptions

### Division of space

Look at how people ignore walls or create walls that aren't there

### Grouping of people

Find barriers to community and communication **Organization of workplace** 

Placement of objects and piles makes the work efficient

### Movement

Movement reveals human preference and work needs.

# Showing what matters in the physical environment

- The physical model shows how the physical environment affects the work.
- The physical model shows how people respond to the environment by restructuring it.
- The physical model is a caricature of the workplace, not a floor plan



## Consolidation - Make a complete view of the data

- Work models presents a different perspective on the work.
- Stepping back and looking at the models together reveals all the different aspects of work and how they relate to each other. it reveals how the whole work of one person hangs together.
- Once all of the interviews have been conducted and modeled, it is time to create the consolidated models from the individual work models.



# Thank you for your attention!!!





### **Heuristic evaluation and Pluralistic walkthroughs**

Shiyan Yuliya, Vera Fetyukova (IMPIT-2008)

User-Centered Design course University of Joensuu, 2009

### The four basic ways of evaluating user interfaces

2

### - Automatically

(usability measures computed by running a user interface specification through some program),

### - Empirically

(usability assessed by testing the interface with real users),

### - Formally

(using exact models and formulas to calculate usability measures),

### - Informally

(based on rules of thumb and the general skill and experience of the evaluators).

### **Inspections methods**

### - Heuristic evaluation

is the most informal method and involves having usability specialists judge whether each dialogue element follows established usability principles.

- Cognitive walkthroughs
- Formal usability inspections

### - Pluralistic walkthroughs

are meetings where users, developers, and human factors people step through a scenario, discussing each dialogue element.

- Feature inspection
- Consistency inspection
- Standards inspection

### Jakob Nielsen (usability consultant)

4

Jakob Nielsen (born 1957 in Copenhagen, Denmark)is a leading web usability consultant.He holds a Ph.D. in human-computer interactionfrom the Technical University of Denmark in Copenhagen.



http://en.wikipedia.org/wiki/File:Jakob\_Nielsen\_1.jpg

### Heuristic evaluation. Common usability principles (heuristics) 5

A list of 10 general heuristics was proposed by Nielsen and colleagues in 1994, based on the analysis of 249 usability problems.

These are:

- 1. Visibility of system status;
- 2. Match between system and the real world;
- 3. User control and freedom;
- 4. Consistency and standards;
- 5. Error prevention;
- 6. Recognition rather than recall;
- 7. Flexibility and efficiency of use;
- 8. Aesthetic and minimalist design;
- 9. Help users recognize, diagnose, and recover from errors;

10. Help and documentation.

### **Heuristic evaluation. Procedure**

6

### **Three main approaches:**

Develop a set of tasks and ask the evaluators to carry them out;
 Provide evaluators with the system goals and allow them to develop their own tasks;

3. Ask the evaluators to assess the dialogue elements.

### **Three main stages:**

- 1. Plan the evaluation;
- 2. Conduct the evaluation;
- 3. Debrief and reporting.

### **Outcomes and Deliverables:**

List of usability problems.

### Heuristic evaluation. Costs

### **Materials Needed**

- A list of heuristics with a brief description of each heuristic;

- A list of tasks and/or the components of the product that you want inspected;
- Access to the specification, screen shots, prototypes, or working product;
- A standard form for recording violations of the heuristics.

### **People and Equipment**

No special equipment

### Heuristic evaluation. Advantages

8

- Relatively inexpensive compared to other evaluation methods;
- Intuitive and easy to motivate potential evaluators to use the method;
- Evaluators do not have to have formal usability training;
- Can be used early in the development process;
- Faster turnaround time than laboratory testing.

### Heuristic evaluation. Disadvantages

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- Individual evaluators identify a relatively small number of usability issues;

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- It may not identify many usability issues;
- Heuristic reviews may not scale well for complex interfaces;
- May not always readily suggest solutions;
- Can be biased by the preconceptions of the evaluators;
- Heuristic evaluations may be prone to reporting false alarms

### **Pluralistic Walkthrough. Procedure**

10

### **Steps:**

1. Generate task scenarios;

2. End users attempt task scenarios;

3. Group discussion of users responses.

### **Outcomes and Deliverables:**

A list of potential usability problems.
 Suggested improvements to UI designs.

### **Pluralistic Walkthrough. Costs**

11

### **Materials Needed**

- Printed screen-shots;
- Writing utensils;
- Room large enough.

### **People and Equipment**

- Photocopying expenses for screen-shot packets and questionnaires;
- 1 usability practitioner serves as walkthrough administrator;
- Another usability practitioner might be required to take notes.;
- 6-10 representative users.

### Time

- 3 hours for carry out the walkthrough;
- 2-3 days to develop the test tasks and build the test materials.

### **Pluralistic Walkthrough. Advantages**

- Generates quantitative and qualitative data on users' actions by way of written responses;

- Reduces test-redesign-retest cycle by generating immediate feedback and discussion of design problems and possible solutions while users are present;

- Can provide early performance and satisfaction data before costly design strategies have been implemented;

- Product developers present during the session gain appreciation for common user frustrations or concerns about designs;

- Group atmosphere encourages collaborative, constructive comments from users, developers, and other members of the product team.

### **Pluralistic Walkthrough. Disadvantages**

- The number of scenarios cevaluation may not gather real user concerns;
- Requires all the users and experts to be together at once;
- The technique allows for only a limited number of scenarios;
- Developers might not feel comfortable hearing criticism about their designs;
- Only a limited number of scenarios can be explored.

### References

- "Usability Inspection Methods" Jakob Nielsen Conference Companion, CHI'94, Boston, Massachuse USA, April 24-28, 1994

- Summary of Usability Inspection Methods by Jakob Nielsen <a href="http://www.useit.com/papers/heuristic/inspection\_summary.html">http://www.useit.com/papers/heuristic/inspection\_summary.html</a>

-"Interaction Design: Beyond Human-Computer Interaction" Helen Sharp, Yvonne Rogers, Jenny Preece

- Heuristic Evaluation http://www.usabilitybok.org/methods/p275

- Heuristic Evaluation http://www.tiresias.org/tools/heuristic\_evaluation.htm

- Heuristic Evaluation http://en.wikipedia.org/wiki/Heuristic\_evaluation

- Pluralistic Usability Walkthrough http://www.usabilitybok.org/methods/p2049?section=special-considerations

- Pluralistic walkthrough http://www.tiresias.org/tools/pluralistic\_walkthrough.htm

- Pluralistic walkthrough http://en.wikipedia.org/wiki/Pluralistic\_walkthrough

### ---THANK YOU FOR YOUR ATTENTION----



### Some questions for you

When should a heuristic evaluation and a pluralistic walkthroughs be performed?

How many evaluators are needed for them?

### When should a heuristic evaluation be performed?

Heuristic evaluation It can be used throughout the design lifecycle – at any point where it is desirable to evaluate the usability of a product or product component.

#### How many evaluators are needed for a heuristic evaluation?

Evidence suggests that three evaluators usually identify just over 50% of the total usability problems.

Increasing the number of evaluators to five, increases the percentage of usability problems identified to approximately 75%.

However, increasing the number beyond this levels results in a diminishing scale of return; doubling the number of evaluators to ten, increases the percentage of usability problems identified to approximately 90% (Nielsen, 1994)

The number of expert evaluators used will depend on time and resources. However, it is recommended that not less than three evaluators should be used.

#### When should a pluralistic evaluation be considered?

Pluralistic evaluations are usually conducted early in the development cycle or when production time is limited.

#### How many evaluators are needed?

Between six and ten representative users should be recruited for the evaluations, plus the product developers and usability experts.

### ---THANK YOU----