Advanced Design of Interactive Systems

Lecture 7: Generative Walkthroughs

Professor: Wendy Mackay  mackay@lri.fr
TA: Yi Zhang  yizhang@inria.fr
Web: Nicolas Taffin  nicolas.taffin@inria.fr

ExSitu lab, Inria & Université Paris-Saclay
5 February 2020

Homework

Review Thursday, 13 February

Each group should have:
• completed video prototype
• results from participatory design workshop
Design Walkthrough

Based on Structured Walkthroughs (Yourdon, 1979)

**Goal:** Find bugs in code
**Technique:** Systematic step-by-step analysis of a document by a small group
**Principles:** Line-by-line analysis, constructive criticism, limited time

Design Walkthrough

Step-by-step evaluation of sequential material to identify as many problems as possible at each step

Similar to brainstorming:
- Goal is to identify maximum quantity of problems
- Contrast with brainstorming: Do not defer judgement

Types of comments:
- Focus on material, not author
- Constructive, not destructive
- Specific, not general
- Problems then questions then suggestions

Examples:
- "The text is too small to read"
- "The user can’t see where to change the setting"
- "That task takes four steps"

Authors: Accept the problems, but do not discuss solutions! Try to find as many issues as possible – don’t solve them.
Design Walkthrough

Appropriate for many types of material

Originally for programmers and their code

However it works well for:
- Text documents: articles, manuals, specifications, reports
- Design resources: design scenarios, storyboards, paper prototypes, video prototypes

Design Walkthrough Roles

Each group evaluates and is evaluated by another group

When your group is evaluated:
- Choose a moderator who:
  - ensures everyone in both groups participate
  - stops discussions
- Choose a scribe who:
  - takes notes

Everyone, in both groups, contributes critiques and suggestions

Design Walkthrough

Group characteristics:
- peers
- bosses should do other types of evaluations
- small
- 4-8 works well
- diverse
- include diverse perspectives

In addition to your personal opinion adopt specific roles:
- technical
- Is there an error or problem?
- user
- Is it hard to do?
- manager
- Is this function necessary?

or apply a set of design rules, principles or perspectives:
- Norman's rules
- Shneidermann's rules
- others...

Design Walkthrough

Group A presents their video prototype to Group B
- Group A: Choose a moderator and a scribe
- Show the full video
- Show each interaction point
- Any critiques?
- Any suggestions?

Remember:
- DO NOT DISCUSS: clarifications only
- DO NOT DEFEND: just note problems

Goal: Group A gets as many critiques as possible
- Group A decides which, if any, to implement
**Generative deconstruction**

What are socio-technical principles?

Social scientists conduct extensive field studies and provide deep insights in the form of socio-technical principles about how people interact with technology in context.

But it is difficult to translate these principles into specific designs.

Generative Deconstruction & Reconstruction

Create a scenario-based artifact that captures current user behavior -- or -- illustrates what has been designed.

First **deconstruct** what is going on:
- Who is the user?
- What is the technology?
- What is the user’s context?
- What is the interaction like?

Then **reconstruct** the design using socio-technical principles to design a new technology or to fix an existing one.

Generative Deconstruction

Apply socio-technical principles to generate grounded designs:

- **Observe** system use in context: breakdowns, workarounds, surprises
- **Deconstruct** design problem: from abstractions to patterns
- **Reconstruct** design solution: revise design space, explore design options

Socio-technical principles

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### Examples: Socio-technical Principles

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Situated Action</td>
<td>Go beyond planned activities; Users decide how to act in unforeseen circumstances</td>
</tr>
<tr>
<td>Rhythms &amp; routines</td>
<td>Build upon routine activities and spatial patterns; Users integrate systems into their daily lives</td>
</tr>
<tr>
<td>Peripheral awareness</td>
<td>Design for both focus and periphery; Users vary degree of engagement</td>
</tr>
<tr>
<td>Co-adaptation</td>
<td>Expect users to re-interpret and customize; Enable capture and sharing of customizations</td>
</tr>
<tr>
<td>Distributed cognition</td>
<td>Let objects and other people reduce cognitive load for memory or communication tasks</td>
</tr>
</tbody>
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**So …**

How do we incorporate socio-technical principles into the design process?

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**Generative Walkthroughs: Creative redesign**

- **Structured walkthroughs**
  - Systematic critique of design artifacts, such as scenarios & storyboards
Generative Walkthroughs: Creative redesign

- Structured walkthroughs: Systematic critique of design artifacts, such as scenarios & storyboards
- Focused brainstorming: Generation of novel ideas, based on socio-technical principles

Exercise: Generative Walkthrough

Goal: Deconstruct your system based on socio-technical design principles, then reconstruct it, using them to generate new ideas for improving the system.

Procedure:
- Choose one of the principles (or assign a principle to different team members).
- Reread the storyboard out loud.
- Go through the storyboard, step-by-step, examining each interaction point.
- Generate at least six ideas inspired by one of the principles to improve the system from the user’s perspective.

Exercise: Generative Walkthroughs

Analyze your storyboard or video prototype.
Class exercise

Convert commands into instruments and substrates

“send” command
- “send” command sends an image to Nicolas
- “set portion” command associates a portion number with a food item

Polymorphism
- “send” accepts images, text, videos, code, etc.
- “set portion” handles food, spices, chemical compositions

Reuse
- “send” forwards parts of conversation
- “set portion” reuses portions in a new recipe

Creating instruments and substrates

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
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<tbody>
<tr>
<td>Turn commands into instruments</td>
<td>Turn relationships created by commands into substrates</td>
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</tbody>
</table>

Reification
- If the command disappears, make it a persistent object
- If the relationship disappears, make it a persistent substrate

Polymorphism
- Handles multiple types of objects
- Handles multiple types of relationships

Reuse
- Reuse user input
- Reuse existing relationships

Exercise: Generative Walkthrough

1. Read your storyboard out loud
2. At each interaction point:
   - Identify examples of reification, polymorphism, reuse
   - Identify any existing socio-technical principles
3. Generate ideas for improving the scenario
   - You must use at least two principles

Goal: Improve your scenario so that you have at least six new interaction points that illustrate socio-technical principles
Homework

Final Presentation

<table>
<thead>
<tr>
<th>Friday 13:00</th>
<th>Here</th>
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<tbody>
<tr>
<td>10-minute presentation per group plus 5-minute discussion</td>
<td></td>
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<tr>
<td>All members of the group participate in the presentation</td>
<td></td>
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Introduction
- Project name and design concept:
- Problem to solve? Solution?

Methods
- Which methods did you choose? Why?

Story
- Illustrate the design concept

Instruments
- What did you use and why?

Conclusion
- What worked? What didn’t? Future?

Grading

Jury will judge on:

- Creativity
- Design principles
- Relationship with user studies
- Justification

Tell a story that illustrates how your design concept is used

Avoid making a “How to” tutorial or a marketing video!

Schedule

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
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<th>Friday</th>
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<tbody>
<tr>
<td>10 Feb 9:00-12:00</td>
<td>11 Feb 9:00-12:00</td>
<td>12 Feb 9:00-12:00</td>
<td>13 Feb 9:00-12:00</td>
<td>14 Feb 13:00-16:30</td>
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<tr>
<td>Intro EE01-EE02</td>
<td>class EE01-EE02</td>
<td>class EE01-EE02</td>
<td>class EE01-EE02</td>
<td>final presentation</td>
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