Advanced Design of Interactive Systems

Lecture 3: Theme and Variations

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ExSitu lab, Inria & Université Paris-Saclay
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Homework

Review: Monday, 10 February

Each group should have:
• Set up your group’s Web page
• Conducted (at least) 8 story interviews*
• Collect other types of user information, either from your ‘client’ groups or other users
• Come up with initial ideas for your project

* Interviews are graded individually
Today

Lecture 3: Theme and Variations
How do you choose a design method?
Exercise: Methods poster
Exercise: Video Brainstorming

Lecture 4: Participatory design
Exercise: Open-ended design

Homework: Initial design

Design methods can:

- Gather artifacts: stories, ideas, designs . . .
- Analyze artifacts: design space, interaction table . . .
- Produce specifics, generalizations

Theme and Variations

Any design method can be varied

What method variations have we already seen?
Theme and Variations

Questioning users
- interviews, introspection, questionnaires
- stories, tutorials, opinions
- memorable events, objects, daily events

Generating ideas
- regular, video brainstorming
- solo, group, two-phase
- lists, post-its
- words, sketches, videos

Across phases
- current scenario, future scenario

How do you choose which variation?

- design phase: beginning – middle – end
- current needs: generate ideas – refine ideas
- resources: supplies – space
- opportunities: access to users
- audience: you – team – users – stakeholders
- resolution: lo fi – hi fi
- result: quantitative – qualitative

What is your current goal?
Theme and Variations
Consider trade-offs between methods
Different methods require different
levels of preparation
resources
effort before and during the activity

Theme and Variations
Consider trade-offs between methods
What are the advantages and disadvantages of each?

<table>
<thead>
<tr>
<th>Method</th>
<th>Pro:</th>
<th>Con:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire frames</td>
<td>clarify graphics</td>
<td>static</td>
</tr>
<tr>
<td>Paper prototypes</td>
<td>rough graphics</td>
<td>highlight interaction</td>
</tr>
<tr>
<td>Solo brainstorm</td>
<td>more ideas</td>
<td>can get stuck</td>
</tr>
<tr>
<td>Group brainstorm</td>
<td>solidarity</td>
<td>group think</td>
</tr>
</tbody>
</table>

Theme and Variations
Design artifacts can take different forms
Lists
Stories
Abstract summaries
Sketches
Paper mockups
Simulations
Tables
etc.

Theme and Variations
Methods vary in terms of time, people, etc.
**Theme and Variations**

At each phase of the design process, ask yourself: “What do I need now?”

Better understand the target audience?
- gather more information: interviews, observation

Refine a design concept?
- select from alternatives

Communicate with users?
- illustrate with a video prototype

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**Generative Design Methods**

**Discovery**
- Collect User Information
- Explore User Needs
- Produce User Insights

**Invention**
- Collect Possibilities
- Explore Categories
- Produce Design Space

**Design**
- Collect Constraints
- Explore Variations
- Produce Prototypes

**Evaluation**
- Collect Use Data
- Explore Results
- Produce Implications

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**Storyboards**

Vary methods to address different needs

For example:

- Storyboards ➔ Branching storyboards
- Breakdown analysis ➔ Story portraits
**Storyboards**

- **Moment**: Highlight what matters, omit the rest
  - Interaction points

- **Frame**: Sense of place, position & focus
  - Start with overview, then show details
  - Intertitles, wide shots, close-ups

- **Image**: Evoke characters, objects, environments
  - Focus on the user’s interaction
  - Use simple special effects

- **Words**: Communicate ideas, voices
  - Intertitle (silent film)
  - Voice-over (narrated), dialogue

- **Flow**: Guide reader
  - Linear or branching

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**Regular storyboard**

<table>
<thead>
<tr>
<th>Title</th>
<th>User(s)</th>
<th>Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Identify key interaction points in the scenario
- Examine the key ideas from the design space (brainstormed ideas)
- Illustrate the interaction between user and novel system
- Describe key issues on the right

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**Branching Storyboards**

**Stanford – Cognitive Aids in the Operating Room**

- Provide cognitive aids to doctors in crisis situations
- Observational studies and interviews in real operating rooms
- Observational and controlled experiments in OR simulator
- Participatory design workshops to create prototypes
- Shift from “cognitive aids” and “checklists” to resource management for people, data, processes

**CURUS, 2011**
Branching Storyboard

Write a tiny, branching one-act play, sub-divided into one-paragraph micro scenes that describes the interaction.

Create one or more characters, each with:
- name, age, gender, motivation
- usually with a profession, expertise
- usually with a goal or motivation

Create one or more realistic setting(s):
- date, time, place, context

Identify a series of events over a period of time.
Prototyping the screen

At each interaction point, consider:
- alternative ideas
- extreme uses
- effects of different situations
- breakdowns

Create an instrument
- explore new options

Did you change your design space?
- Can you justify your design choices?

Prototyping the crash cart

Branching storyboard

Design Space Dimensions

- Revisit your design dimensions:
  - How can you systematically explore alternatives along several dimensions?

- For example: Remote communication
  - Shared data (4):
    - activity level, text, photo, video
  - Synchronicity (3):
    - live synchronous, back&forth, asynchronous
  - Access control (4):
    - sender, recipient, shared, system

- Creates a combinatorial explosion of possibilities:
  - $4 \times 3 \times 4 = 48$ possibilities
Latin Square example

Shared data:
- activity level, text, photo, video

Synchronicity:
- live synchronous, back&forth, asynchronous, live synchronous

Access control:
- sender, recipient, shared, system

Combine alternatives, one per category:
- shared activity level, live synchronous, sender control
- shared text, back & forth, recipient control
- shared photo, asynchronous, shared control
- shared video, live synchronous, system control

Use combinations for the branching storyboard

Branching storyboard

At each interaction point, consider:
- alternative ideas
- extreme uses
- effects of different situations
- breakdowns

Did you change your design space?
Can you justify your design choices?

Representing the design processes

How do you capture the key elements of a creative design process?

Start with critical object interviews to elicit stories:
- Capture images, audio, video, hand-written notes

Representing the design processes

How do you capture the key elements of a creative design process?

Start with critical object interviews to elicit stories:
- Capture images, audio, video, hand-written notes

Summarize the process with a breakdown analysis
- Identify breakdowns as interaction points

Identify breakdowns as interaction points
Breakdown analysis

List breakdowns that negatively affect the user’s experience

Capture as an interaction point:

<table>
<thead>
<tr>
<th>Synchronizing with a developer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer asked me to specify all the distances between elements</td>
</tr>
<tr>
<td>I had to work out every distance individually</td>
</tr>
<tr>
<td>Took a lot of time!</td>
</tr>
</tbody>
</table>

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**Story Portraits**

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**Breakdown Analysis**

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**Setting up a grid to synchronize with the developer**

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Representing the design processes

How do you capture the key elements of a creative design process?

Start with critical object interviews to elicit stories:
Capture images, audio, video, hand-written notes

Summarize the process as a ‘Story Portrait’
Step-by-step, illustrate the story

An inverted process:
Creating a book about being strip-searched

Revealing a design process
Over-riding the grid

Theme and Variations

Choose a variation for your current needs

<table>
<thead>
<tr>
<th>Basic Methods</th>
<th>Variations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generate or Collect resources</td>
<td>Pair conversations, Video observation, Design workshop</td>
</tr>
<tr>
<td>Analysis</td>
<td>User Space, Functional table</td>
</tr>
<tr>
<td>Introspection</td>
<td>Observation, Video observation, Diary study</td>
</tr>
<tr>
<td>Peer introspection</td>
<td>Design brief, Breakdown analysis</td>
</tr>
<tr>
<td>Observation</td>
<td>Video observation, Diary, Log study</td>
</tr>
<tr>
<td>Video interview, Analyze information</td>
<td>Design analysis, User Space</td>
</tr>
<tr>
<td>Video or Peer interview</td>
<td>Design diagram, Architecture diagram</td>
</tr>
<tr>
<td>Analyze information</td>
<td>Design scenario, Extreme scenario</td>
</tr>
<tr>
<td>Analyze information</td>
<td>Design implications, Design requirements</td>
</tr>
<tr>
<td>Design dimensions</td>
<td>Design walkthrough, Heuristic walkthrough</td>
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