

## Design and Evaluation of Interactive Systems

### Finding out about users (Cont'd)

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lectures adapted from Wendy E. Mackay

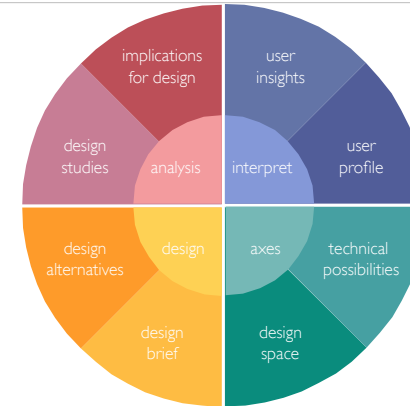
## Generative Design

Discovery  
Who is the user?

Invention  
What is possible?

Design  
What should it be?

Evaluation :  
Does it work?



## Phase I Understanding Users

### Finding out about users

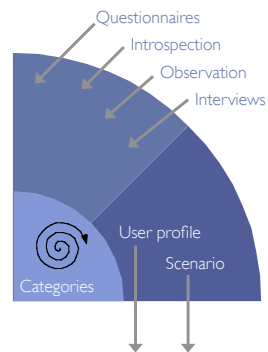
- Introspection
- Observation
- Interviews
- Questionnaires

### Analyze information

- Grounded theory categories

### Create resources for design

- Scenario
- User profile
- Persona



## Phase II Invention

### Collect or sample information

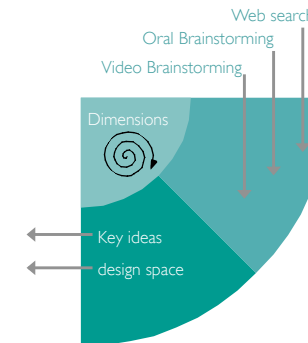
- Web search
- Oral Brainstorming
- Video Brainstorming

### Analyze information

- Preference votes
- Technology dimensions

### Create resources for design

- Key ideas
- Design space



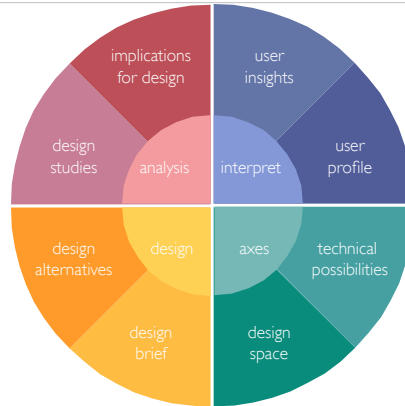
Generative Design

Discovery  
Who is the user?

Invention  
What is possible?

Design  
What should it be?

Evaluation :  
Does it work?



Remember there are many methods!

Understand the user	Analyze the user	Invent new ideas	Prototype the system	Evaluate the system	Redesign the system
"Fly-on-the-wall observation" <small>Ethnography</small>	Interactive Thread <small>HCI</small>	Oral brainstorming <small>Psychology</small>	Paper prototyping <small>Participatory Design</small>	Focus group <small>Marketing</small>	Generative Walkthrough <small>HCI</small>
Critical incident interview <small>Human Factors</small>	Contextual Inquiry <small>Anthropology</small>	Design space <small>Design</small>	Video prototyping <small>Participatory Design</small>	Usability study <small>Human Factors</small>	Technology probe <small>Design/Arts</small>
Questionnaire <small>Sociology</small>	Task analysis <small>Human Factors</small>	Sketching <small>Design/Arts</small>	Wizard of Oz <small>Human Factors</small>	Design Heuristics <small>HCI</small>	Design Rationale <small>HCI</small>
Cultural probe <small>Design/Arts</small>	Scenario analysis <small>Activity Theory</small>	Video brainstorming <small>Participatory Design</small>	Software simulation <small>Computer science</small>	Design walkthrough <small>Psychology</small>	
Grounded Theory <small>Cognitive Psychology</small>	Protocol analysis <small>Cognitive Psychology</small>	Design room <small>Design/Arts</small>	Design scenario <small>HCI</small>	Design Critique (Crit) <small>Design/Arts</small>	

Homework (due today Dec 11)

1. Group: Choose a topic for your project  
You need to identify a problem and a set of users  
== poll
2. Individual: At least two interviews each  
Use at least one critical incident question  
Probe for details  
== poll

Exercises in Class  
11 December 2013

1. Interview analysis (Grounded theory) and Categories
2. User profile
3. Persona (1 in class, 1 extreme)
4. Use scenario
5. Generate new ideas

Analyzing the results	
Informal Analyses:	
Interview Summaries	Collection of anecdotes from interviews either typical, or interesting
Tables or graphs	Summary of results in quantitative form to identify the problems to solve
Requirements list / needs	Group of critical points

Analyzing the results	
Formal Analyses:	
GOMS	Technique that models user behavior with <i>Goals, Operators, Methods</i> and <i>Selection Rules</i>
Contextual Design	(interpretation) Technique for analyzing ethnographic data, with <i>Flow, Sequence, Cultural, Artifact</i> and <i>Physical</i> models
Grounded Theory	Technique for analyzing interviews with <i>Codes, Concepts, Categories</i> & a <i>Theory</i>

Grounded Theory	
Not a theory, but a technique that ensures the results of the study (e.g. using interviews) have external validity (based on the real world)	
Codes	Identify key points in interviews and give them a code (Focus on interaction points, existing or possible Surprising findings, problems, good examples of use)
Concepts	Organize codes in groups of similar concepts
Categories	Create concept categories and give them names
"Theory"	Make hypothesis that can be tested or decide on problems you want to focus on

**In-class Exercise**  
**Grounded Theory**  
**60 min**

Create a resource for design

Goal: Inspiration for a system to design

1. **User Profile**  
Description of the characteristics and needs of the users
2. **Persona**  
A specific, imaginary person who represents a member of the user population. Normally, personas represent 'typical' users. However, it is sometimes useful to create extreme characters to help you push the limits of the design.
3. **Use scenario**  
A realistic description of a series of events and activities of one or more users (personas) in a real-world setting. Scenarios provide a composite view of the most important or relevant actions identified in interviews and observation.

User Profile

Factual description of the needs and characteristics of the target group of users

- Top-down analysis of the user population:  
*Who is the audience for the system you are designing?*  
 What did you discover from your studies of users?  
*What are the key problems to solve?*  
*(Consider surprises, breakdowns and user innovations)*  
 What are the user's most important, relevant characteristics?  
*Use the Grounded Theory categories you identified*  
 Which of the users needs will you address?  
*Forms the basis for the design your system*

**In-class Exercise**  
**User Profile**

**30 min**

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Persona	
Personal details:	Name, age, gender Physical description Occupation, relevant activities Representative or Extreme user?
Personality:	Describe the person with design-relevant details Likes, dislikes? Capabilities, weaknesses? Unusual characteristics?
Activities:	Typical, breakdowns, user innovations
Identify the relationship with real users interviewed or observed.	

Persona example	
Timothy Powell 52 years old Civil Engineer	
Quotes/Attitude/Possible problems in using systems "Speed trumps security when it comes to exchanging documents." "Look, you may build bridges but I design them and that's the most critical part!"	
Goals (general and for using the system) Get everything done before heading home Cover his back and avoid blame	
<a href="http://chopsticker.com/2007/06/08/download-an-example-persona-used-in-the-design-of-a-web-application/">http://chopsticker.com/2007/06/08/download-an-example-persona-used-in-the-design-of-a-web-application/</a>	

Extreme character	
Identify people who are extreme along one or more dimensions:	
Normal hands	→ Arthritic hands
Takes vitamins	→ Cancer patient
Exercises regularly	→ Athlete
Adult	→ Child
It is useful to brainstorm ideas about what it means to be extreme in the context for which you are designing, even if you do not end up using such extreme characters.	
Used very often in business contexts	

## In-class Exercise

### Persona

30 min

Create a resource for design

Goal: Inspiration for a system to design

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Use Scenario

Goal: Create a realistic description of the user in context  
*emphasizing opportunities for design*

Procedure  
Identify activities and critical incidents from your data  
choose from multiple users  
Include: normal and unusual situations  
planned and unplanned activities  
effective and problematic incidents  
Choose a specific day, setting and hypothetical, realistic user  
Tell a story, step-by-step of what the user does  
include relevant detail in a series of *interaction points*  
Ideally, go over the scenario with at least two users

Writing a use scenario

Potential design resources:

- Raw data:
  - Real-world observations, interviews,
  - Personal experience (if applicable)
  - Research literature, marketing materials
- Interpreted data:
  - Analysis of user characteristics and needs
  - Design brief / design requirements
  - Personas and extreme characters

Use Scenario example

Problem with using this scenario only:  
does not capture breakdowns  
could be a bit more detailed about the goal of the user

It's approaching 5:30 and Timothy is finishing up for the day. He makes a few small changes to his CAD drawing, based on requests from the clients. He shakes his head, wondering why they asked for three lanes of traffic when they obviously need four. Oh well, he has a record of the request and he doesn't have time to ponder the sanity of the clients. He saves the drawing, attaches it to an email to the client, and hits "Send." In the few minutes it takes him to pack up for home, he watches a progress bar informing him that his drawing (~100MB) has been uploaded to the FTP server.

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Use scenario: What happens now?

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Like a tiny, branching one-act play,  
sub-divided into one-paragraph micro scenes  
that describe a series of 'interaction points'

Create one or more personas (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

**In-class Exercise**  
**Use Scenario**  
**30 min**

**In-class Exercise**  
**Problem**  
**30 min**

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Homework  
18 December 2013

1. Group: Complete exercises not done in class:
  - Interview Analysis
  - User Profile
  - 2 personas
2. Individual: 10 web searches

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### Web search exercise

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Search for alternative technologies

Search on the web 10 **interaction techniques** (not systems)

(that you do not already know)

that can help in your project

keep in mind the choices you made last week

**What did you find?**