HCI Bootcamp

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web: *https://ex-situ.lri.fr/workshops/hci-bootcamp-2018*

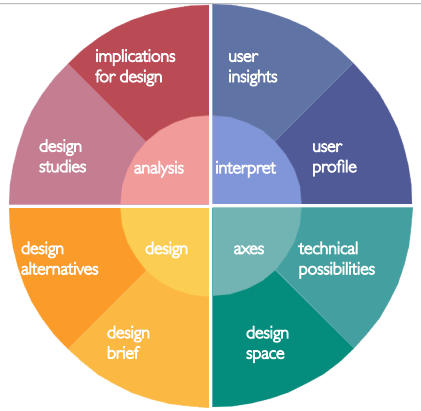
Generative Design

Discovery
Who is the user?

Invention
What is possible?

Design
What should it be?

Evaluation :
Does it work?



Tuesday

Review:
- Web searches
- Video Brainstorming

Class exercises:
- Ex #10 Design space
- Ex #12 Design concept
- Ex #13 Alternatives
- Ex #14 Interaction Table
- Ex #15 Diagram
- Ex #16 Design scenario
- Ex #17 Storyboard #1

Invention
Websearch

Invention

Video
Brainstorming

Invention

Design
Space

Design Space

Gather ideas relevant to your design problem:
some are your own brainstormed ideas
some are from others, e.g., your web search

Extract different design dimensions that characterize the ideas

Place the ideas along the design dimensions
- at least three ideas per dimension
- generate new ideas if you find gaps
- explore the intersections of different dimensions

Select a subset of dimensions and ideas to create a design space

Exercise: Design space

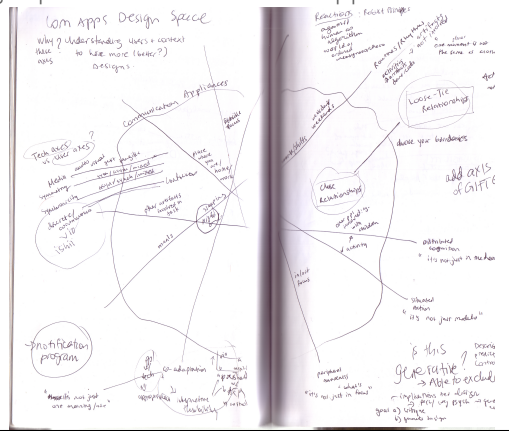
Identify the key ideas

Categorize the ideas into design dimensions

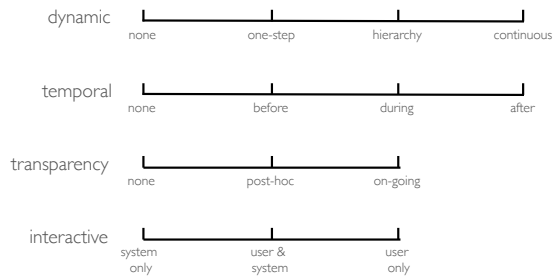
Place the ideas along the design dimensions
- 3 or more ideas per dimension
- generate new ideas if you find gaps
- explore the intersections of different dimensions

Create a design space to explore:
Choose interesting dimensions and ideas

Design space: Communication Apps



Design Space: Octopocus



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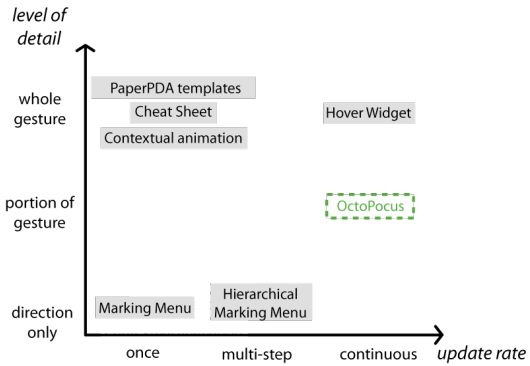


Generative Design

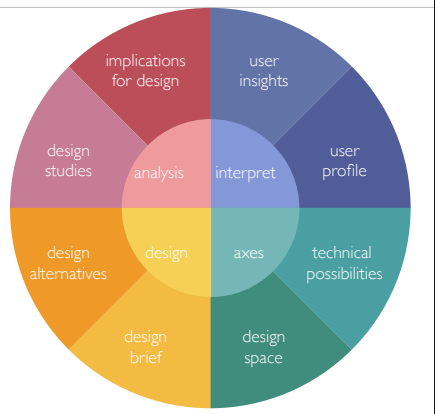
Discovery
Who is the user?

Invention
What is possible?

Design
What should it be?

Evaluation
Does it work?

Redesign
How to improve it?

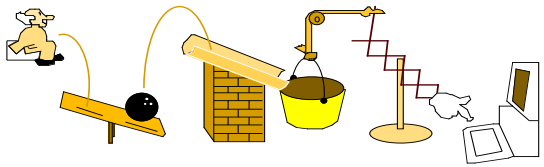


Design
What should it be ?

Design requires choices

Prototypes help express specific concepts
at different levels of representation
Goal: *quality*, not quantity of ideas

Careful! Each choice limits options
But also poses new questions
and may suggest new possibilities



Prototyping interaction

Design scenario
Imagine the system from the user's perspective

Video Prototype
Illustrate the use of the system in context
"sketch" dynamic, interactive user experiences

Wizard of Oz
Simulate the system live
with a human operator 'behind the curtain'

Simulation
Create a working subset of the system

What is a prototype ?

Prototype =
concrete representation of an interactive system

Characteristics

Representation:	form of prototype	*sketches - simulations*
Precision:	level of detail	*informal - complete*
Interactivity:	interaction	*watch - interact*
Evolution:	lifecycle of prototype	*throw out - iterative*

The choice of prototype depends upon the
design phase and the specific needs of the designers

Prototyping helps the designer …

Consider different design alternatives

Ensure usability under diverse conditions

Help users and other stakeholders imagine the interface

Focus on problematic parts of the interface

Representation

Paper 'take away' prototypes
- Easy and fast to create
- Most useful at the beginning of the design process
- *examples: sketch storyboard sequences, screen mockups, video prototypes*

On-line prototypes
- Use the computer, longer to create, more polished
- More appropriate later in the design process
- *examples: animations, interactive videos, scripting languages, interface builders*

Precision

Low fidelity (lofi) prototypes with little detail
- Great for rapid exploration of ideas
- *example: paper sketches, SILK*

High fidelity (hifi) prototypes, very detailed
- Good to communicate specific design considerations
- *example: dialog box with layout alternatives*

Note: A detailed representation is not always precise
(You can omit elements that have not been decided)

Details

A system can be good in theory
- but unusable in practice
- because of flaws in the interface … even small ones

Good prototypes let designers work with
- different sets of details at the same time

Good prototypes allow users to envision the
- final system: but also to feel comfortable
- suggesting changes

Level of Interactivity

Non-interactive (fixed)
No interaction, but can show potential interaction
example: a video clip showing user interacting with a device

Low interaction (pre-determined path)
Can test several alternative forms of interaction
example: designer shows a screen shot, user indicates her action, the designer shows the result

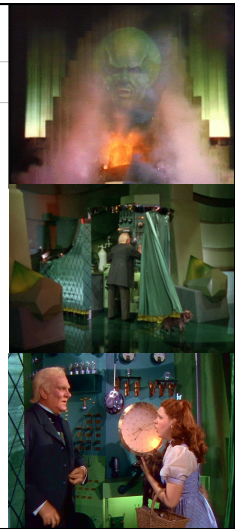
High interaction (open)
Users interacts with the system, with some limitations
example: Wizard of Oz or computer-based simulation

Wizard of Oz

Technique for prototyping
novel user interfaces

Wizard of Oz:
Designer 'plays computer'
to create an interactive
experience for the user

Useful for creating video prototypes
but also for creating live experiences
that rapidly explore different design
alternatives



Evolution

Rapid prototypes: Early exploration of diverse alternatives
Easy to create, check, throw away afterwards
example: paper prototype or interface like SILK

Iterative prototypes: create individual modules
Create successively more refined versions
example: series of prototypes, successively more detailed

Evolving prototypes: may become the final product
Different completed sections are successively added
example: a software module has functionality added before being added to the final system

Prototyping strategies

Horizontal: complete one layer of functionality at a time
example: develop the details of the interface without a working database

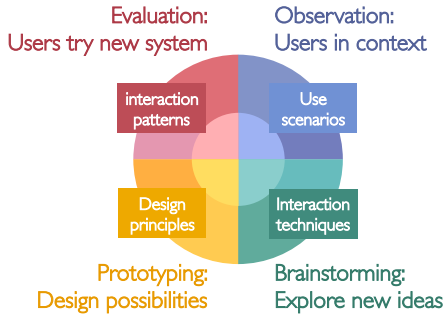
Vertical: complete functionality of part of the system
example: develop the spelling checker fiirst

Task: create functionality necessary for a single task
example: develop the interface for adding and editing an image

Scenario : create functionality needed to run a scenario
example: develop the functions needed to edit three images and spell-check a document within a design scenario

Beaudouin-Lafon and Mackay (2007) Prototyping Tools and Techniques

Video supports every phase of design



Design

Design

Concept

How do you find the design concept?

Based on your studies of users
choose a problem to solve
specific to your audience.

Generate a variety of ideas
that offer potential solutions

Create a design space to
embody the set of alternatives

Choose a design concept to explore
focus on interaction, not just functionality

Creating a concept

Identify a real, specific problem.
- Real problems tend to be complex and messy
- Look for a small, simple aspect of a real problem
- Rather than a stereotypical 'toy' problem

Trade-off between power and simplicity:
- Less is More

Be curious, be creative, seek surprises and new opportunities

Describe the design concept

How will the user be able to do?
- What are the objects of interest? content
- How will users interact with them? interaction
- What can the system do? function
- How will the user learn it? discovery

Justification
- What are the alternatives?
- What are the advantages and disadvantages of this solution?

Iterate the design concept

Apply the concept to the user scenario:
- How will a user interact with the objects of interest to perform which functions, in a real-world setting?

Consider:
- Does the system respond to real user needs?
- Is it specific enough to specify a design?
- Is it technically possible?

Describe the concept in one sentence

Avoid Analysis Paralysis

CHOOSE SOMETHING !!

The first idea is NEVER complete or right or "good"

ALWAYS reevaluate, redesign, and refine

Exercise: Design concept

Describe the design concept

One-sentence description

What user problem(s) does it solve?
- Is the interaction clear?

What technology does it use?
- How does it help users?

Design

Design Alternatives

Exercise: Design alternatives

Don't stop with your first design concept
… but don't explore 50 ideas either!

Carefully consider 3-5 alternatives

Focus on alternative forms of interaction,
not different functionality

Button presses and pull-down menus encourage
procedural, annoying interfaces
You can do better!

lunch!

Design

Design Scenario

Using a Design Concept

Revisit the user profile and personas
- Can you target the users better ?

"Animate" the personas in the use scenario
- How does applying the concept address their issues?
- Can you push the limits to generate something new?

Create a design scenario
- Revisit each interaction point in the scenario
- Apply video brainstormed or new ideas

Create a storyboard and a video prototype
- to illustrate the concept in context

Use Scenario

Quick review: user-based design resources

1. Critical Interview stories
   - Specific, real incidents where a user has a problem that illustrates an opportunity for design, organized into categories.
2. User profile
   - High-level desciption of target user's characteristics and needs
3. Personas (and extreme character)
   - Specific, imagined people who have typical or extreme needs from the target user group identified in the user profile
4. Use Scenario
   - Realistic description of a series of events and activities, based on key issues identified in the interviews, in which realistic people (personas) face problems in a realistic setting, that serve as the foundation for the design of a new interactive system.

Reminder: Use scenario

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

From use to design scenarios

Tell a story that illustrates how one or more people interact with technology in a real-world setting

Use scenario:
Draws from real-world observation of people who face challenges that a new technology might address

Design scenario:
Builds upon current scenarios and speculates how these people would interact with new technology, in this setting

Change the use scenario if it helps you explore alternatives

Tip: Choosing character names

Make names short, ideally one syllable

Either alphabetize them:
Ann, Bob, Chuck, Dave, Eli

Or link names to functions:
Pat is a patient
Sue is a surgeon

Design scenarios ≠ Concept scenarios

Design scenarios
Help interaction designers explore possibilities
Value: realism, grounded, challenges ideas

Contrast with:

Concept and marketing videos
Help 'sell' the concept
Value: idealized use, market potential

Scenarios: What to do

Create a theme … and variations
to explore alternatives

Balance both 'normal' and unusual situtions
especially breakdowns and errors
(… and normal is rarely normal)

Consider external events that affect interaction
as well as motivated action by the user

Include patterns of interaction over time
including repetitions and wasted effort

Highlight surprises

Scenarios: What NOT to do

Avoid 'over-selling' the technology
- Explore options rather than one solution

Avoid irrelevant detail
- Focus on interaction, not users' personal lives

Avoid flowery description
- Stick to the facts

Avoid humor, at least for now
- Difficult to do well
- Often distracting

Design scenario format

Title:	Event or technology being designed
Who?	Characteristics: name, sex, age, profession, ...
What?	Event that sparks the story
Where?	Location
When?	Date, time
Motivation:	Why is this happening?
Situation:	Relevant detail to aid understanding
Story:	Paragraph-by-paragraph description of who does what and why.

Exercise: Design scenario

Create a realistic description of the use in context of a new system

Procedure
- Start with the personas and the use scenario
- Decide how they will interact with your new system in a real context
- Tell the story, step by step

Design scenarios → Video Prototypes

Design scenarios lead to storyboards which lead to video prototypes

Each provides a successively deeper way to think about situated interaction

Each should be considered highly iterative:
- Creating alternatives is cheap
- Use them to explore alternatives
- Don't be afraid to try and reject ideas

Design scenarios → Video Prototypes

Scenarios use words to describe situations
- Create multiple paragraphs to explore options

Storyboards break up the action and illustrate it
- forcing you to think more deeply about interaction
- They take more time, so select options carefully

Video prototypes are dynamic sketches of interaction
Acting out the interaction
- enhances thinking deeply,
- remembering ideas
- sharing with users, designers, management, stakeholders
- deciding what to program or test

Design

Storyboards

Storyboard

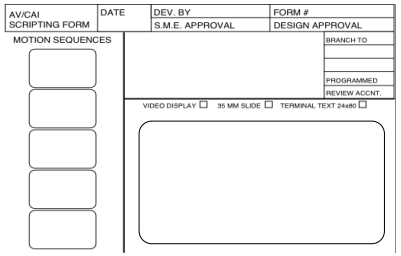
Goal
- Illustrate the design scenario,
  - emphasizing the details of the interaction with the system being designed

Procedure
- Divide the design scenario into a series of interaction points
- Create a series of images and text to illustrate each point

Storyboard

Borrowed from cinema to illustrate a scenario
- Key images
- Framing (shots)
- Subtitles
- Flow

Overview of the action
Key interaction points
Coherent order
Relevant details



Digital Equipment, 1982

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

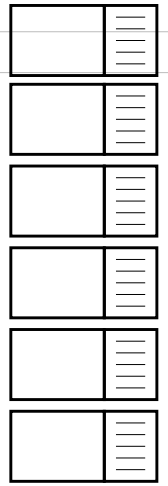
Image Evoke characters, objects, environments
Focus on the user's interaction
Use simple special effects

Words Communicate ideas, voices
Intertitle (silent film)
voice-over (narrated), dialogue

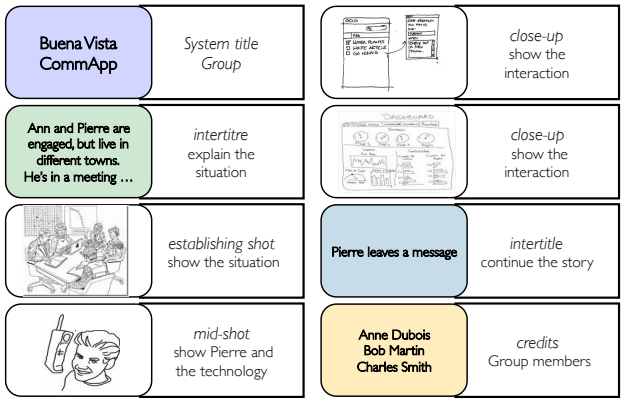
Flow Guide reader
Linear or branching

Regular storyboard

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



Storyboard structure



Video supports every phase of design