Advanced Design and Evaluation of Interactive Systems

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Slides: *http://insitu.lri.fr/People/AdvancedDesignOfInteractiveSystems2017*
HCI Bootcamp slides: *http://insitu.lri.fr/People/HCIBootcamp2017*

ExSitu lab, Inria & Univ. Paris-Sud
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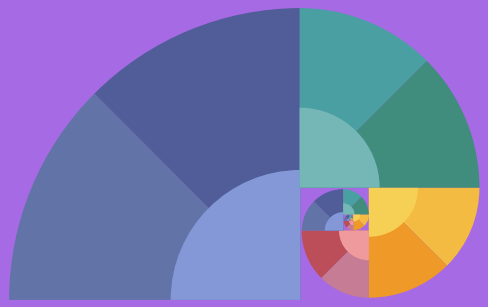
For Wednesday: (morning session)

Each group should have:
- design concept: key idea
- set of interaction points (+use scenario) based on: interviews, introspection, questionnaire results

Create your
- design scenario and design storyboard
- create a design diagram

We will run a design walkthrough in class

Story Portraits



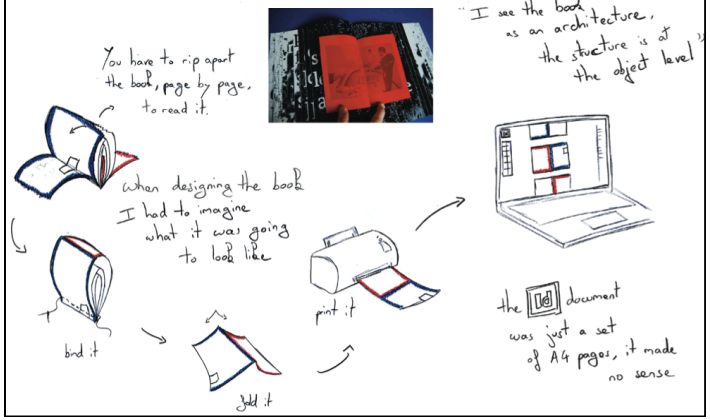
Representing the design processes

How do you capture the key elements of an activity or process?

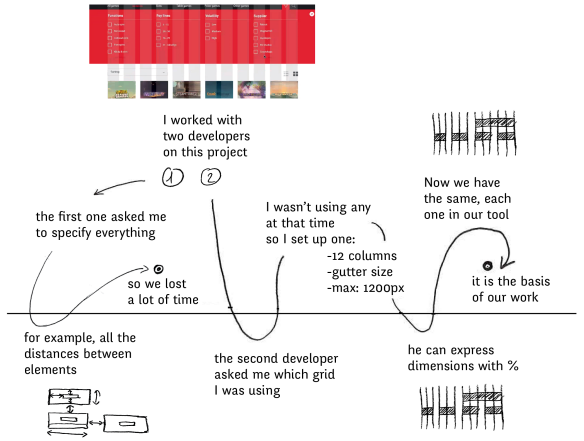
Start with critical object or incident interviews to elicit stories:
Capture images, audio, video, hand-written notes

Summarize the process as a 'Story Portrait'
Step-by-step, illustrate the story with sketches

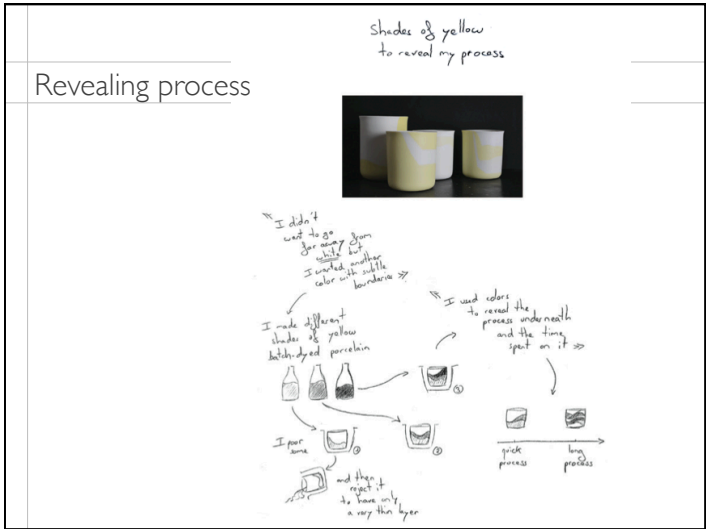
An inverted process: Creating a book about being strip-searched



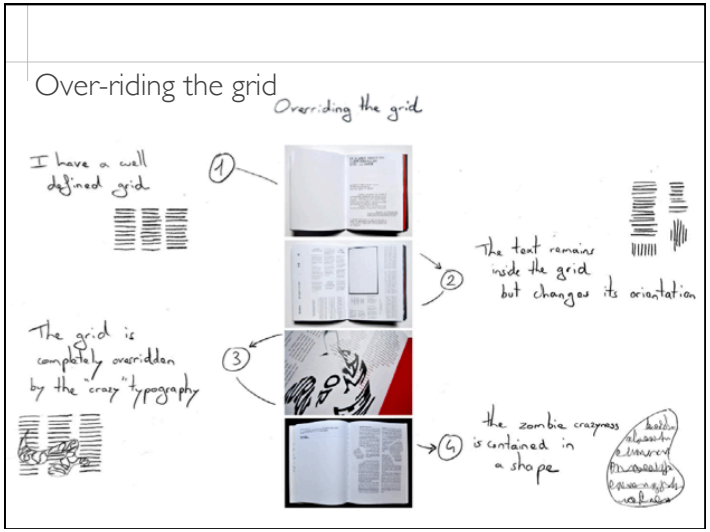
Setting up a grid to synchronize with the developer



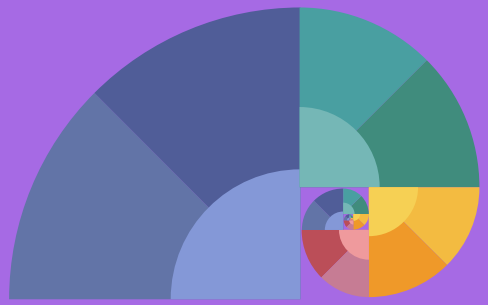
Revealing process



Over-riding the grid



Storyboards



Scenario → Storyboard → Video Prototype

Design 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

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

Title
User(s)
Situation

Establishing shot
First interaction

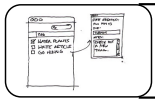
Closeup shot
Second interaction

Mid-range shot
Third interaction

Wide shot
Forth interaction

Final credits

Storyboard structure

Buena Vista CommApp	*System title Group*		*close-up* show the interaction
Ann and Pierre are engaged, but live in different towns. He's in a meeting …	*intertitre* explain the situation		*close-up* show the interaction
	*establishing shot* show the situation	**Pierre leaves a message**	*intertitle* continue the story
	*mid-shot* show Pierre and the technology	**Anne Dubois Bob Martin Charles Smith**	*credits* Group members

Storyboards

Moment Highlight what matters, omit the rest
Interaction points

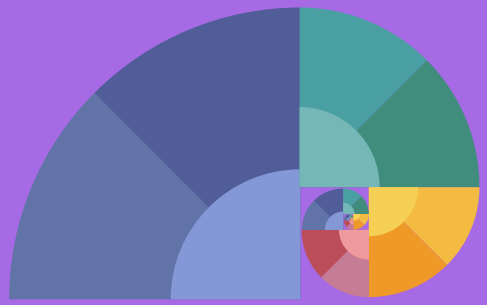
Frame Sense of place, position & focus
Start with overview, then show details
Intertitles, wide shots, close-ups

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

Branching Storyboards



Create a 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

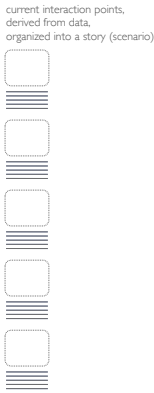
Create one or more realistic setting(s):
date, time, place, context

Identify a series of events over a period of time

Create a branching storyboard

The first set of interaction points
represent how people *currently*
interact with an existing system

Create a use scenario,
composed of these interaction points
then suggest design alternatives
in a branching storyboard



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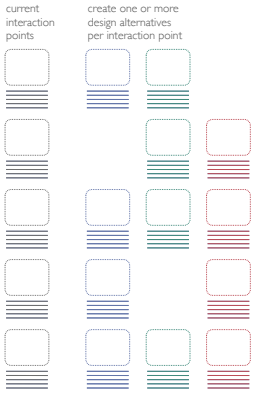


Design Space Dimensions

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 x 3 x 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

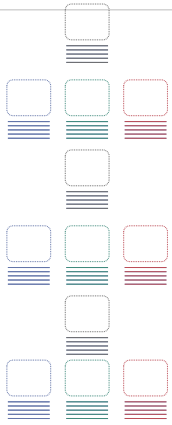
Use combinations for the branching storyboard

Branching storyboard

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

Create an instrument
explore new options

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



Stanford – Cognitive Aids in the Operating Room

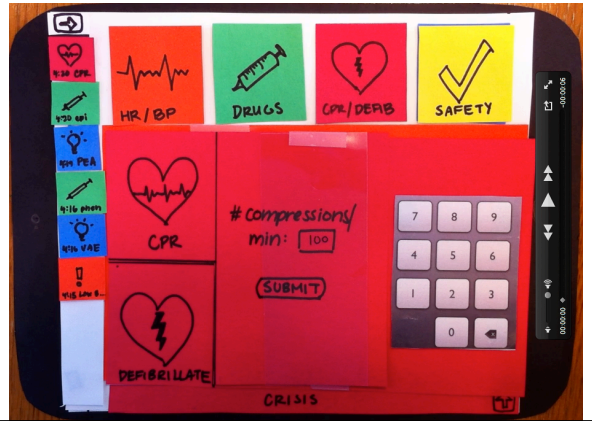
Provide cognitive aids to doctors in crisis situations

Observational studies and interviews in real operating rooms
Observational and controlled experiments in OR simulator
Participatory design workshops to create prototypes

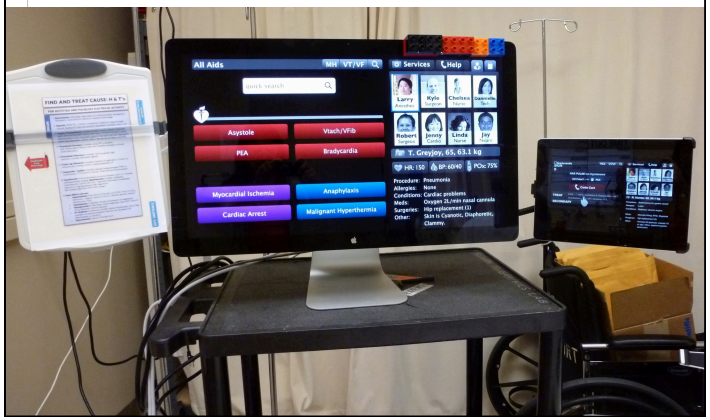
Shift from "cognitive aids" and "checklists"
to resource management for people, data, processes

CURUS, 2011

Prototyping the screen



Prototyping the crash cart



Exercise: Storyboard

Convert your design scenario into a storyboard
to illustrate the key aspects of your design concept

Goal
- Illustrate the design scenario, emphasizing interaction

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

Exercise: Branching Storyboard

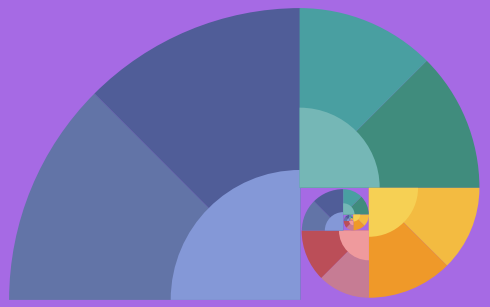
Begin with your storyboard
- Identify a set of interaction points
- Create at least one instrument

Examine your design space dimensions
- Update it as necessary to match the current design
- Generate 3 interaction methods per design dimension

Use a latin square approach to recombine the
interaction points along multiple dimensions

Record your storyboard on the interaction point forms

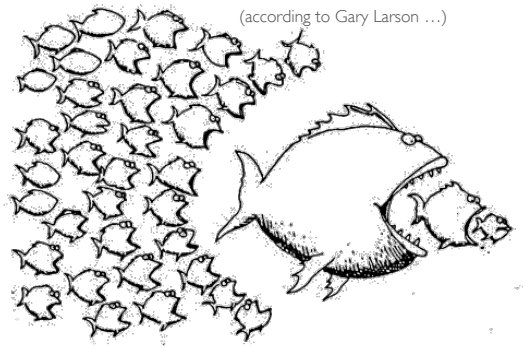
Design Diagrams



Can you explain your design?

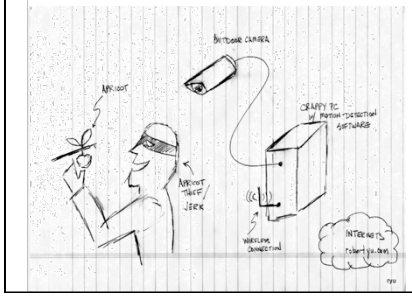
Top-down
or
Bottom-up?

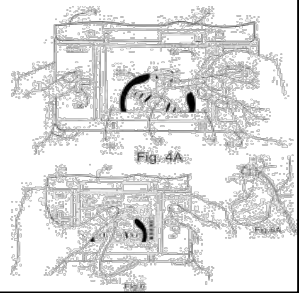
(according to Gary Larson …)



Exploded diagrams

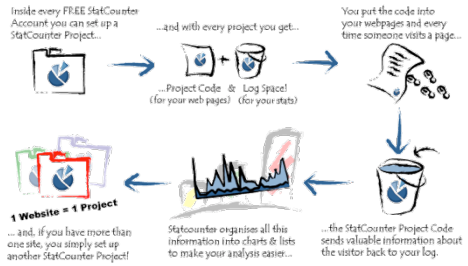
Top-down explanation:
- What are the main components?
- What are the main functions?
- How does it work?





Process diagrams

Top-down explanation:
- What are the main actions?
- What happens when?



Design Walkthrough

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

Structured Walkthroughs
Yourdan, '77

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

Design Walkthrough

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

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
- Shneidermans' rules
- others…

Design Walkthrough Roles

Each group evaluates and isevaluated 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 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