

What is Design? (part 2)

Informatics 132
4/5/2012

Ockham's Razor

Given a choice between functionally equivalent designs, the simplest design should be selected.¹

Ockham's razor asserts that simplicity is preferred to complexity in design. Many variations of the principle exist, each adapted to address the particulars of a field or domain of knowledge. A few examples include:

- “Entities should not be multiplied without necessity.”—William of Ockham
- “That is better and more valuable which requires fewer, other circumstances being equal.”—Robert Grosseteste
- “Nature operates in the shortest way possible.”—Aristotle

CHEWBACCA ROAR CONTEST!!!



want to hear
how it turned
out?

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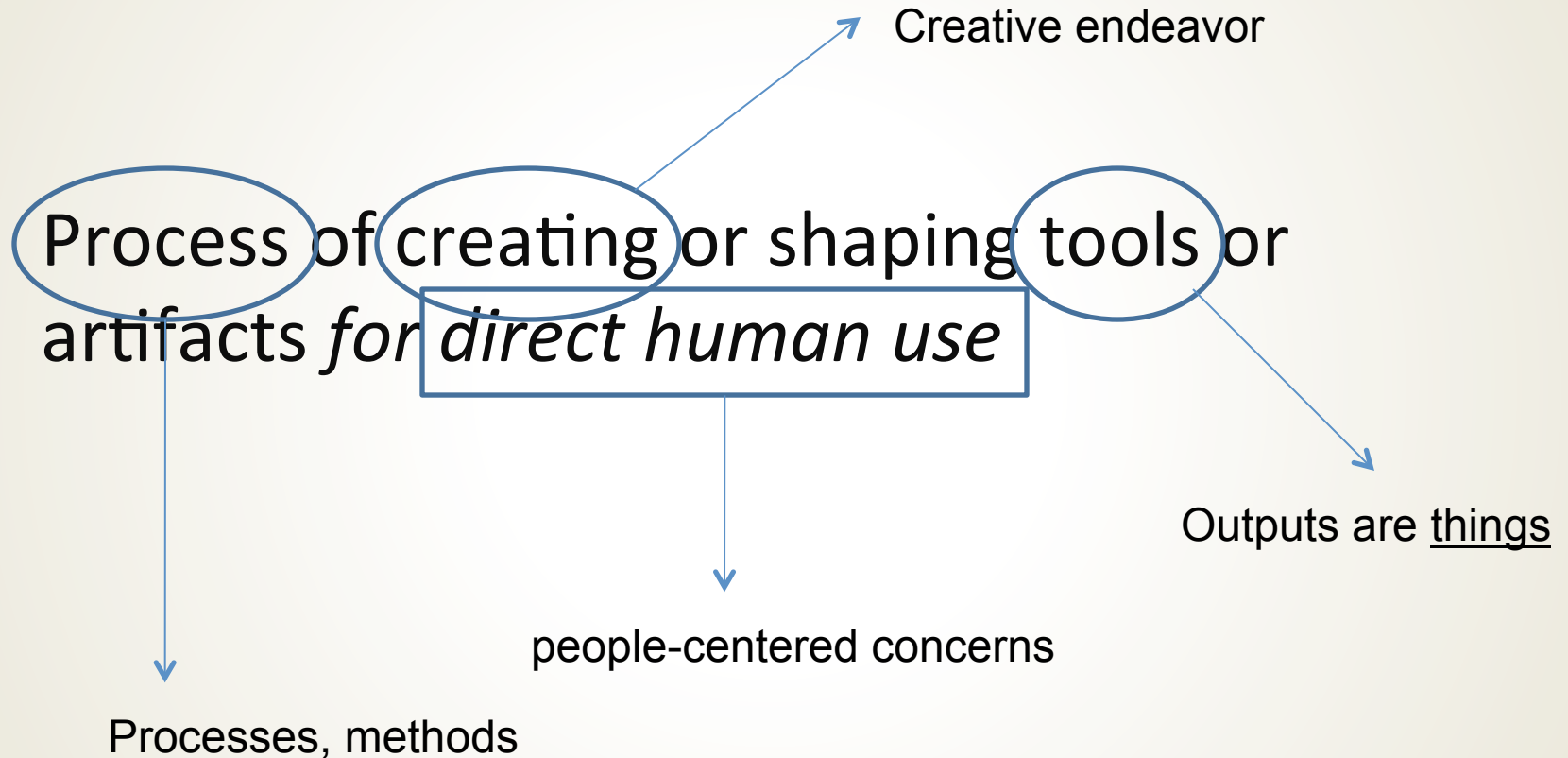
TODAY

- Lecture: “What is Design?” (cont.)
- Due Today: *Class Facebook*

UPCOMING

- Due Next Wednesday:
P0 - Design Question & Project Team Form
- Due Next Friday:
Sketching: Health & Fitness: Sketch three ideas relating to health, wellness, rehabilitation, therapy, exercise, nutrition, etc.

Reminder: What is Design?



Design vs. Engineering



Engineering

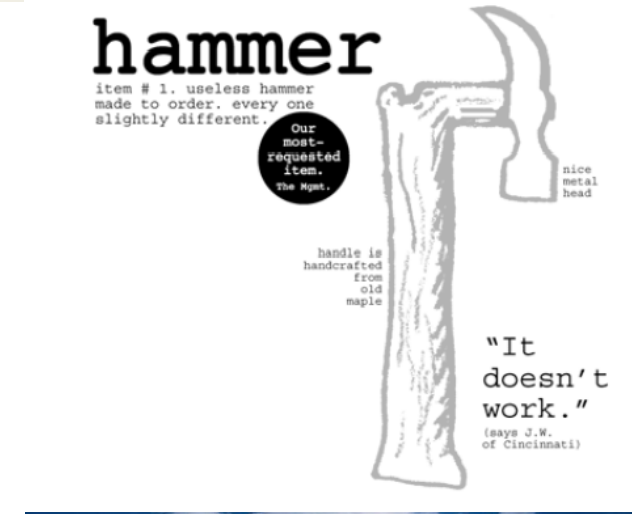
- Make a mostly-known outcome possible
- Construct a sturdy bridge based on specifications
- Concerned with what can be done
- Reliance on well-established formulae
- Humans may or may not be directly “in the loop”

Design

- Envision new possibilities, new outcomes
- Determine what outcome should result among infinite possibilities
- Reliance on process over formulae
- Humans are central actors “in the loop”

Design vs. Art

- Design (as we regard it) concerns the creation of something useful and usable
- Art does not require with this restriction
 - The test: how to deem what is “good”?



Other Contrasts

- Interface vs. interaction design
 - Artifact versus sequence
 - Graphic < interface < interaction < user experience
- Usability vs. user experience (UX) design
 - Evaluation versus holistic design
 - Designing it right vs. the right design

design vs. Design

- design: the general activity we've been talking about so far
- Design: the formal field, including theory, methods, literature, and practice

Who Does Design?



Designers! Designers are often...

- Applied anthropologists
- Design ethnographers
- Social psychologists
- Cognitive psychologists
- Experimental psychologists
- Computer scientists
- Engineers
- Interface designers
- Interaction designers
- Industrial designers
- Graphic designers
- Information architects
- Usability professionals
- Technical writers
- Dramatists

Can anyone be a designer?

Don Norman says “yes”

- Mostly in the “design” sense

Bill Buxton says “no”

- Mostly in the “Design” sense

Physical design

**INDUSTRIAL
DESIGN**

**MECHANICAL
ENGINEERING**

**GRAPHIC
DESIGN**

**PHYSICAL
ERGONOMICS**

**PRODUCTION
ENGINEERING**

**PHYSICAL
SCIENCES**

Human and subjective

Technical and objective

**WEB
DESIGN**

H.C.I.

**HARDWARE
ENGINEERING**

**COMPUTER
SCIENCES**

**INTERACTION
DESIGN**

**SOFTWARE
ENGINEERING**

Digital design



What is Designed?

“Look around you. The only thing not designed is Nature.”

– David Kelley

Anything consciously intended for human use is designed

– Often poorly, though :(



Why is Design Hard?

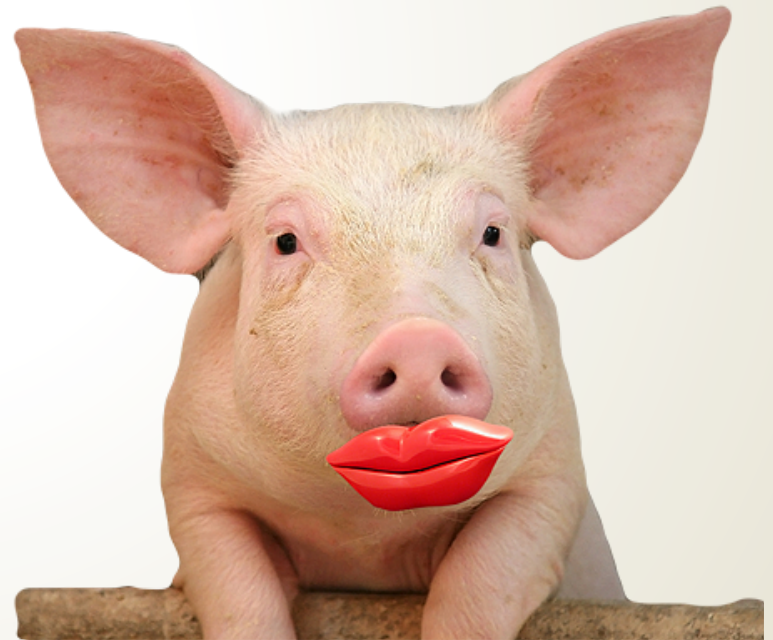
- Interface design is multidisciplinary
- Judging/predicting which designs will be successful and which will not is difficult
- It is simply hard to come up with good solutions
- All design involves making tradeoffs
- Humans are unpredictable
- Humans make errors
 - Mistakes
 - Slips

Core Skills of Design

- To synthesize a solution from all of the relevant constraints, understanding everything that will make a difference to the result
- To frame, or reframe, the problem and objective
- To create and envision alternatives.
- To select from those alternatives, knowing intuitively how to choose the best approach.
- To visualize and prototype the intended solution

Design is not just “lipstick on a pig”

- Not just changing how things look
- Or making things pretty
- Or designing graphics



Interaction design mantras

“The user is not like me.” –Don Norman

“The best way to have good ideas is to have lots of ideas.” – Linus Pauling

“Fail often to succeed sooner.” – IDEO

“Enlightened trial-and-error succeeds over the careful planning of the lone genius.” – IDEO

“The user is not like me”

Why not? (from Norman)

- Designers are much more familiar with the interface and with the problems being solved than users.
- Designers are confident. Users are often fearful.
- Designers work in settings that are different than the context in which the product may be used.
- Designers may have different skills than users (e.g., perceptual, cognitive, or domain skills).

Design questions



What is a Design Question?

- Usually asks how something which doesn't already exist can solve a problem
- Often starts with “How can...?”
- Examples:
 - How can technology help reduce stress surrounding everyday home life?
 - How can we design something to help keep up with home maintenance?

Design Questions vs. Research Questions

- These are all *design questions*
 - How can technology promote healthy sleep habits?
 - How can we reduce information overload?
 - How can college students manage their many distractions and find time to concentrate?
 - How can mobile technology promote leisure activities?
 - What is a way to support individuals while on vacation?
 - Why type of technology can promote meditation and focus and reduce stress?
- The answer to them is a **thing** (artifact, system, policy, etc.)

Design Questions vs. Research Questions

- Research questions are different
- The answer to these are **knowledge**
 - How do people currently relax?
 - What are things that people bring with them on vacation?
 - What are the major sources of distraction for college students?

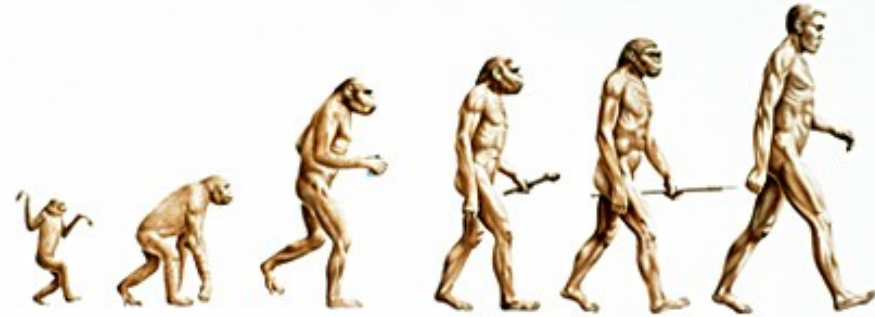
Research Questions

- Write these after you've determined your design question
- More in a few minutes

Specificity -> Scope

- How specifically you word your design question will affect how much you need to do and how many people you need to design for
- For your project, you'll need to scope your design problem to something you can complete this quarter
- This can be done by choosing a part of the problem and/or narrowing it down to a more specific audience

Evolution of Questions



- Your question may not stay exactly the same throughout the project
 - Your user research may show that it's not actually a problem, or that technology is not the solution
 - You may find that your scope is too large or too narrow
- Your design question can evolve over time, and become more or less specific, but you should always have a current design question your whole team agrees upon

Be Picky About your Design Questions

- Once you have a draft of a design question, take a look at each word
- How do you define it? Is it necessary? Would a different word or phrase make it more clear or change the scope?

Discussion: Pick Apart these Design Questions

- How can mobile technology promote leisure activities at home?
- How can technology support pet care?
- How can technology can promote a safe and secure home?

Research Questions

- Remember, the answer to these is “knowledge” as opposed to “a thing”
- What do you need to know in order to come up with the answer to your design question?
 - Often who, what, when, where, why, how...
- Good general research questions:
 - What is the current practice?
 - Who is going to use this?
 - What are their needs?
- Again, specificity will help make your life easier

Discussion: What are some research questions for...?

- How can technology help reduce stress surrounding caring for a sick child?
- How can we design something to help keep up with home maintenance?
- How can we keep a separation between home and work life?

Project Information



Project Components

P0: Design Question & Project Team Form (5%)

P1: User Research (30%)

P2: Ideation & Sketching (15%)

P3: Prototyping (25%)

P4: Design Spec. including Evaluation (25%)

P0: Design Question & Team Form

Determine your project design question and at least 3 research questions.

Complete team form:

- Names, UCI IDs, and email addresses of everyone in your group
- Project team name (does not necessarily have to have anything to do with your project)
- At least one time that you all commit that you will be available to each other every week
- 3-5 research questions you need to answer to make progress
- A short 2-3 sentence statement about who you think interested stakeholders in your project are

Due next Wednesday!

P1: User Research

- Define stakeholders
- Choose 3 user research methods and apply them to your problem
 - e.g., interviews, contextual inquiry, survey, observations, diary studies
- Come up with design requirements

P2: Ideation & Sketching

- As a group, brainstorm at least 15 ideas for potential solutions to your users' problem
- Use methods from class to help narrow down the sketch ideas to the best three

P3: Prototype

- Construct a prototype or prototypes of your most promising ideas
 - Can be whatever method you choose
 - We will discuss numerous types in class
 - Paper, software, interactive, video, etc.

P4: Final Report & Evaluation

- Develop & write up an evaluation plan.
- Conduct a pilot evaluation with your target users (if available) using the prototype from P3. Incorporate changes you would make to your final eval plan based on this experience.
- Write up a final design spec outlining details of your design solution and the rationale behind them

Example: Instant Date Match

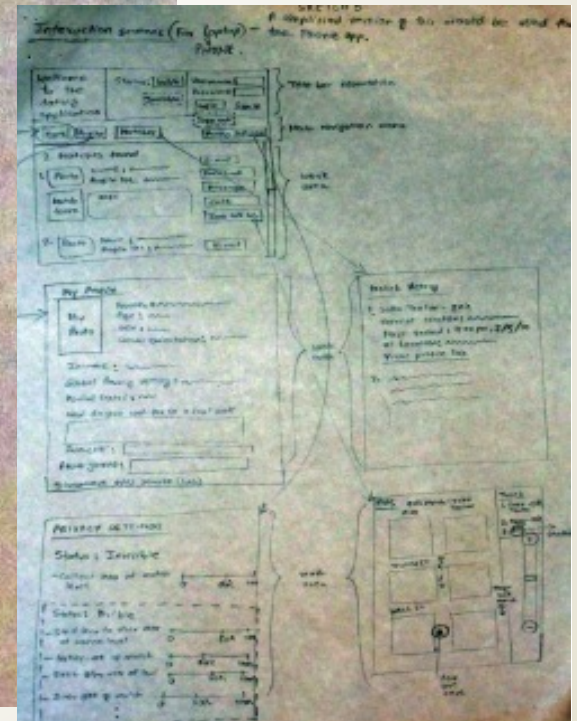
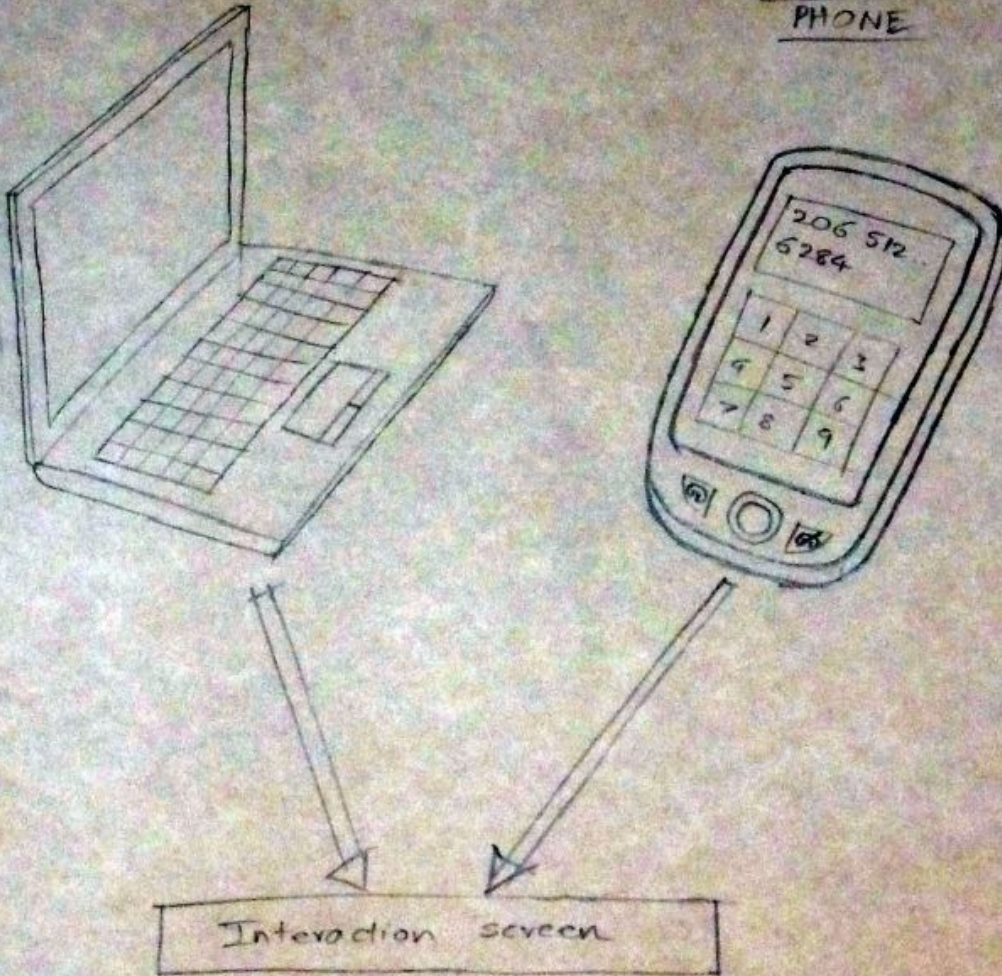
- Community: Singles
 - Problem: Connecting people who are shy
- P1: User Research: Contextual Inquiry, Interviews, and Survey with people currently single and recently connected

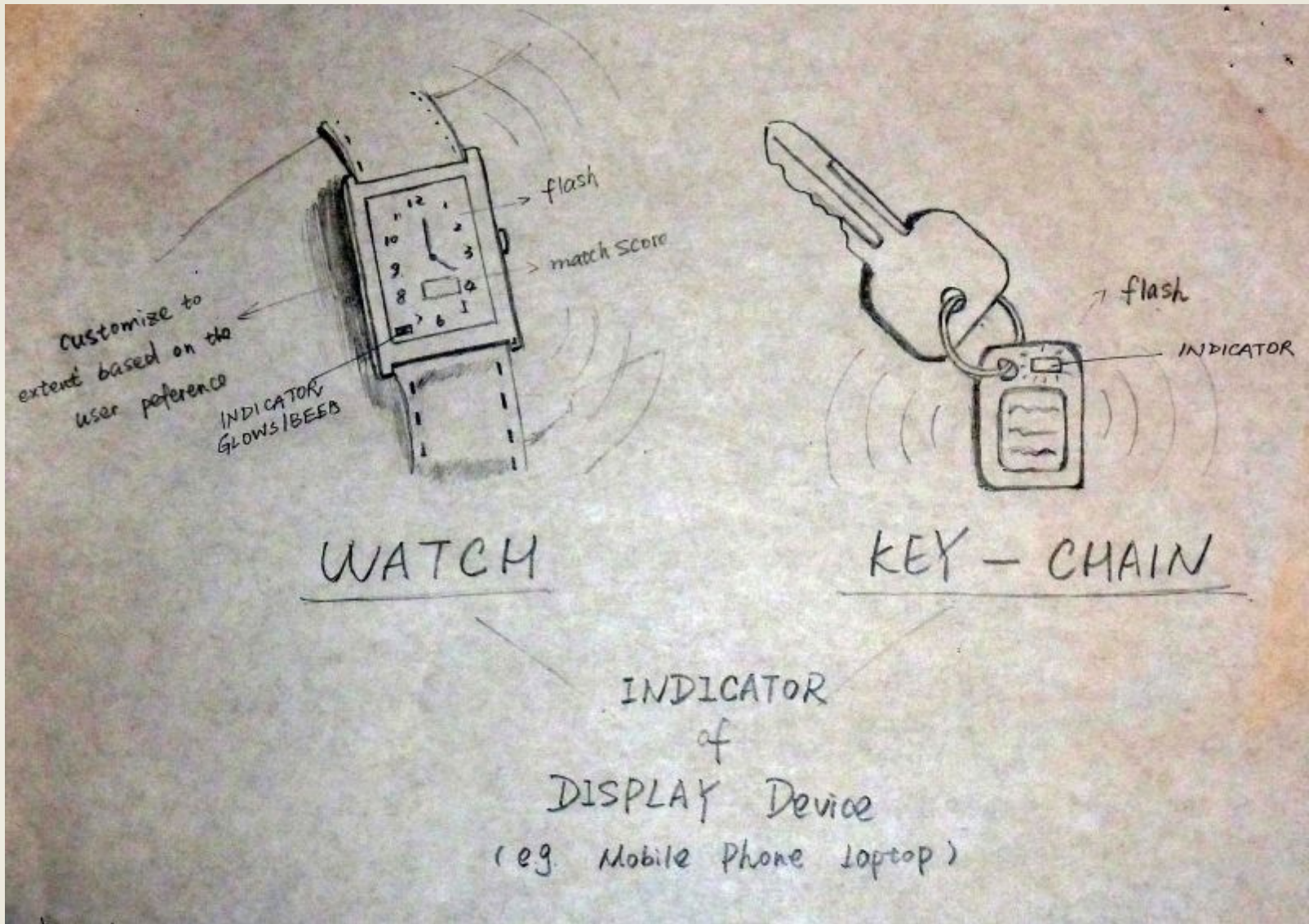
P2: Ideation & Sketches

- Came up with 25 sketches
- Narrowed it down to 3

LAPTOP

MOBILE
PHONE





P3: Video Prototype & Mock Ups

<http://www.youtube.com/watch?v=DQRlvTudTg8>

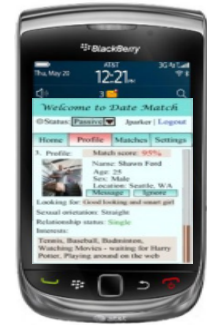
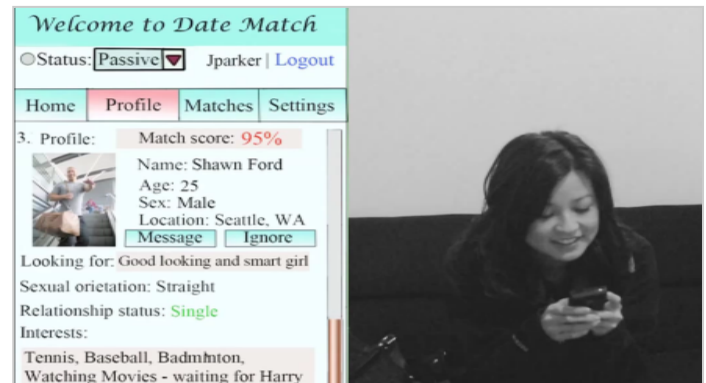


Figure 8: The finalized design prototype



P4: Evaluation

- Users shown video prototype & screen mockups
- Interviewed and surveyed afterwards to provide feedback and opinions
- A bit high level, but still provided valuable feedback

General Advice

- Spend a lot of time gathering information
- Do what makes sense, not what you know how to design for
- Look for ways to leverage stakeholder's interests
- Face time is worth a lot, try to work with other group members around if you can
- Have a specific stakeholder, design for someone in particular

Break

- Talk amongst yourselves about potential groups
- Exchange contact information
- Talk about possible project ideas

Upcoming

Monday: User-Centered Design Process

Have you got your sketchbook yet?

- Sketch 3 sketches on whatever you want (open-ended)