User Experience Design I  
(Interaction Design)

Day 2
Process Models, Elements and Usability
Process Models, Elements and Usability

- Definition and Paradigms of UX/Interaction Design
  - Process Models
  - Elements of UX/Interaction Design
  - Usability I
Bill Verplank
INTERACTION

How do you...

feel?

map

know?

...do?

hot

cool

I handle

de button
Bill Verplank says that the interaction designer has three questions to answer; they are all “How do you . . . ?” questions.

source: [3]
1. “How do you do?”

How do you affect the world?
You can grab hold of a handle and manipulate it, keeping control as you do it.

2. “How do you feel?”

How do you get feedback?
That’s where a lot of feelings come from; a lot of our emotions about the world come from the sensory qualities of those media that we present things with.

3 “How do you know?”

The map shows the user an overview of how everything works, and the path shows them what to do, what they need to know moment by moment
"Any hot medium allows of less participation than a cool one, as a lecture makes for less participation than a seminar, and a book for less than a dialogue."

Marshall McLuhan
Interaction Design Paradigms

A paradigm is an example that serves as a pattern for the way people think about something.

It is the set of questions that a particular community has decided are important. For interaction design there is often some confusion about what paradigm you are working with. The basic question is, What is a computer?
Tool

Doug Engelbart, the inventor of the computer mouse, thought of the computer as a tool.

Styles of interaction changed from dialogs, where we talk to a computer and a computer will talk back to us, to direct manipulation, where we grab the tool and use it directly. The ideas of efficiency and empowerment are related to this tool metaphor.

source: [3]
Media

In the nineties, designers thought of computers as media, raising a new set of questions.

How expressive is the medium? How compelling is the medium? Here we are not thinking so much about a user interacting with or manipulating the computer, but more about them looking at and browsing in the medium.
Life

Starting in the mid nineties, people have been talking about computer viruses or computer evolution; they are thinking of artificial life.

When the program has been written, it is capable of evolving over time—getting better and adapting. The programmer is in a way giving up responsibility, saying that the program is on its own.

source: [3]
Vehicle

Another metaphor is the computer as vehicle, and we have to agree on the rules of the road.

There has to be some kind of infrastructure that underlies all computer systems. People spend their careers determining the standards that will define the infrastructures, and hence the limitations and opportunities for design.

source: [3]
Fashion

The media metaphor plays out to computers as fashion.

A lot of products are fashion products. People want to be seen with the right computer on. They want to belong to the right in-crowd. Aesthetics can dominate in this world of fashion, as people move from one fashion to another, from one style of interaction to another style.

source: [3]
User Experience Design

![Diagram with hexagons: useful, desirable, valuable, accessible, credible, findable, usable]
Back Stage

User Interface

Visible

Behind the Scenes

Capturing

Connecting

Combining

Contextualizing

Transferring

Coordinating

Storing
Standart UCD Design Process Model

source: [4]
Appearance/Affordances
Appearance

Appearance is the major source (texture is the other) of what cognitive psychologist James Gibson, in 1966, called affordances.


An affordance is a property, or multiple properties, of an object that provides some indication of how to interact with that object or with a feature on that object.

source: [2&5]
Appearance/Affordance has many variables for interaction designers to alter:

1. proportion
2. structure
3. size
4. shape
5. weight
6. color (hue, value, saturation)

All of these characteristics (and more) add up to appearance, and nearly every design has some sort of appearance, even if that appearance is a simple command line.

source: [5]
Usability Basics

source: [5]
Usability is a term used to denote the ease with which people can employ a particular tool or other human-made object in order to achieve a particular goal.
Benefits of usability testings

- Higher revenues through increased sales
- Increased user efficiency
- Reduced development costs
- Reduced support costs
Parking Machine

http://www.flickr.com/photos/rdolisny/2760207306/
Microwave

http://www.flickr.com/photos/geek-boy/2522619142/in/photostream/
Copier

http://29.media.tumblr.com/tumblr_if9kxCI8R1qd989o1_500.jpg
Remote Control
Remote Control
Hierarchy of **Design Needs**
Maslow’s Hierarchy of Needs

Design Hierarchy of Needs

- Physiological
- Safety
- Love
- Self-Esteem
- Self-Actualization

- Functionality
- Reliability
- Usability
- Proficiency
- Creativity

source: [7]
Functionality needs **have to do with meeting the most basic design requirements.**

For example a HDD recorder must, at minimum, provide the capability to record play, and review recorded programs. Designs at this level are perceived to be of little or no value.
Reliability needs have to do with establishing stable and consistent performance.

For example, a HDD recorder should perform consistently and play back recorded programs at an acceptable level of quality. If the design performs erratically, or is subject to frequent failure, reliability needs are not satisfied. Designs at this level are perceived to be of low value.
Maslow’s Hierarchy of Needs

- Physiological
- Safety
- Love
- Self-Esteem
- Self-Actualization

Design Hierarchy of Needs

- Functionality
- Reliability
- Proficiency
- Creativity
- Usability

source: [7]
Usability needs have to do with how easy and forgiving a design is to use.

For example, configuring a HDD recorder to record programs at a later time should be easily accomplished, and the recorder should be tolerant of mistakes. If the difficulty is too great, or the consequences of simple errors too severe, usability needs are not satisfied. Designs at this level are perceived of moderate value.
Maslow’s Hierarchy of Needs

Design Hierarchy of Needs

- Physiological
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- Self-Actualization

- Functionality
- Reliability
- Usability
- Creativity
- Proficiency

source: [7]
Proficiency needs have to do with empowering people to do things better than they could previously.

For example, a HDD recorder that can seek out and record programs based on keywords is a significant advance in recording capability, enabling people to do things not previously possible. Designs at this level are perceived to be of high value.
Maslow’s Hierarchy of Needs

Design Hierarchy of Needs

- Creativity
- Proficiency
- Usability
- Reliability
- Functionality
- Proficiency
- Usability
- Reliability
- Functionality
- Creativity

source: [7]
Creativity is the level in the hierarchy where all needs have been satisfied and people begin interacting with the design in innovative ways.

The design, having satisfied all other needs, is now used to create and explore areas that extend both the design and the person using the design. Designs at this level are perceived to be of the highest value, and often achieve cult-like loyalty among users.

source: [7]
Aesthetic-Usability Effect

Aesthetic designs are perceived as easier to use than less-aesthetic designs. Aesthetic designs look easier to use and have a higher probability of being used, whether or not they actually are easier to use.

source: [7]
Flexibility-Usability Tradeoff

source: [7]
The flexibility-usability tradeoff is exemplified in the well known maxim “jack of all trades, master of none”. Flexible designs can perform more functions than specialised designs, but they perform the functions less efficiently.
Flexibility-Usability Tradeoff

source: [7]
Navigation
Navigation
How did I get here.....?
How did I get here.....?
iPhone
Navigation gives us something “to hold on”

It tells us what we’ll find and establishes a level of trust between the user and the people who build the system.
USABILITY IN EVERYDAY LIFE!
frequent users

novice users

infrequent users

expert users
Audi A4 Series Cockpit

Audi R15 Racing Cockpit

http://2.bp.blogspot.com/_SM9A_sqV/GgMWS8XpNRI/AAAAAAAADww/HezQgfpubgI/s1600/Audi+R15+Plus+Cockpit.jpg
It is relatively easy to design for the perfect cases, when everything goes right, or when all the information required is available in proper format.

Don Norman
• Heuristic evaluation
• Heuristic estimation
• Cognitive walkthrough
• Pluralistic walkthrough
• Feature inspection
• Consistency inspection
• Standards inspection
• Formal usability
- Heuristic evaluation
- Heuristic estimation
- Cognitive walkthrough
- Pluralistic walkthrough
- Feature inspection
- Consistency inspection
- Standards inspection
- Formal usability
Jakob Nielsen (NN Group)

https://s3.amazonaws.com/media.nngroup.com/media/people/high-res-photos/jakob_mouse_big.jpg
Heuristic (hyū-'ris-tik) is a method to help solve a problem, commonly an informal method. It is particularly used to rapidly come to a solution that is reasonably close to the best possible answer, or 'optimal solution'.
Visibility of system status

Match between system and the real world

User control and freedom

Consistency and standards

Error prevention

Recognition rather than recall

Flexibility and efficiency of use

Aesthetic and minimalist design

Help users recognize, diagnose, and recover from errors

Help and documentation
Visibility of system status

Match between system and the real world

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Help and documentation

Example: “Web Design, Filling the Blanks”

Yammer

Quelle: [3,7]
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Help and documentation
USABILITY Testing Applied
Mobile Usability Lab

The mobile laboratory setting consisted of two different elements:

1. The user-testing environment, with the eye-tracking Tobii Pro Glasses 2 for recording the field of view and the eye movement of the user in full HD, as well as an iPhone 6 to record the interviews.

2. The observation was captured with an IBM laptop and the Tobii Pro eye-tracking software.

The user testing was conducted with a prototype of the new Frymaster controller, with a 7” touchscreen monitor to display the provided test software; this prototype was equipped with two large buttons for start/stop to enable the users to execute the given tasks and judge the applicability of our UI concept.

Figure 6. UX mobile laboratory setting
Eye-Tracking Glasses

- Full HD wide angle scene camera
- Gyro and accelerometer
- 2 cameras per eye
- Microphone
- Removable protective lens
- Exchangeable nose pad

https://www.tobiipro.com/imagevault/publishedmedia/gw66xob79wkirj0720oh/TobiiPro-Glasses2-tech-specs-image-3_1.jpg
Usability Testing in the Field
Usability Testing in the Field
Video Overview: Usability Testing in the Field
Usability Testing

Report contains:

- Study Design
- User Profiles
- Questionnaire Results
- Interview Quotes
- Summarised Findings
- Design Recommendations
Standart UCD Design Process Model

source: [4]
Paperprototyping & Wireframes
What is it?

Paper prototyping is a widely used method in the user-centered design process, a process that helps developers to create products/screen based applications that meets the user's expectations and needs.

It is **throwaway prototyping** and involves creating rough, even hand sketched, drawings of an interface to use as prototypes, or models, of a design.
History

Paper prototyping started in the mid 1980s and then became popular in the mid 1990s when companies such as IBM, Honeywell, Microsoft, and others started using the technique in developing their products.
Paper prototype of a typical form-filling screen

User test of a low-fidelity paper prototype of a website

Paper prototype of a tabs-based design

Typical set-up of the usability laboratory for a test session with a paper prototype
User test of a device-based interaction

User test of a high-fidelity paper prototype of a homepage.

Testing hardware user interfaces: mockup of a kiosk.
Wireframes
PAPER PROTOTYPING POP

Take photos of your sketches or design in the app

Link your screens together using hotspots

Play with your app idea or test it out on friends

Or share with others by using Facebook, Twitter, Email...
Video-demo

https://www.youtube.com/watch?v=EGp20lVwUa8
- choose from a wide range of interface modules
- import your sketched wireframes
- turn sketches into clickable prototypes
PAPER PROTOTYPING BALSAMIQ
- choose from a wide range of interface modules

- create fast low fidelity clickable prototypes
## POP VS. BALSAMIQ

<table>
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<tr>
<th>POP</th>
<th>BALSAMIQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Use your own sketches</td>
<td>+ Create new mockups directly from the “Create New” menu</td>
</tr>
<tr>
<td>+ Fast and easy prototyping</td>
<td>+ Simply click to edit wireframes</td>
</tr>
<tr>
<td>− Limited UI elements</td>
<td>+ Sketch-based wireframes allow designers to focus on functionality</td>
</tr>
<tr>
<td></td>
<td>+ 30 days free trial</td>
</tr>
<tr>
<td></td>
<td>− Limited functionality</td>
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</tbody>
</table>
Overview Prototyping Tools

Low Fidelity
- POP
- Balsamiq

Mid Fidelity
- Sketch
- Proto.io
- Pixate
- axure
- Mockplus

High Fidelity
- InVision
- Marvel
- Justinmind
- Framer
- Adobe XD
Overview UI Prototyping Tools

<table>
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<th>Prototyping Tools</th>
<th>Mockplus</th>
<th>Axure</th>
<th>Balsamiq</th>
<th>Justinmind</th>
<th>Sketch</th>
<th>Adobe XD (Preview)</th>
<th>Invision</th>
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<td>Average</td>
<td>Plug-in Required</td>
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<tr>
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Video-demo

https://www.youtube.com/watch?v=1H7Ql9hmbuM
References (Books):