User Experience Design I
(Interaction Design)

Day 2 and 3
Process Models 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
Bill Verplank says that the Interaction/UX 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."
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?

source: [3]
**Intelligence**

In the early days, designers thought of computers as people and tried to develop them to become smart, intelligent, and autonomous.

The word “smart” is one that we associate with this paradigm, expecting the machine or product to be smart and to know how to do things for the person who uses it.

[source: http://www.clker.com/clipart-4348.html]
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.

source: [3]
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]
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.
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]
Process Models, Elements and Usability

• Definition and Paradigms of UX/Interaction Design

• Process Models

• Elements of UX/Interaction Design

• Usability I
User Experience Design

usable
valuable
findable
credible
useful
desirable
accessible

source: [3]
Front Stage

Back Stage

User Interface

Visible

Behind the Scenes

Capturing

Transferring

Connecting

Coordinating

Combining

Storing

Contextualizing
Double Diamond

source: [8]
Double Diamond

Why? and How?
Getting the **right** Design and the Design **right**...

Bill Buxton - Sketching User Experiences
Double Diamond

DISCOVER | DEFINE

What?

DESIGN | DELIVER

source: [8]
**Double Diamond**

**DISCOVER STAGE**

- Consumer behaviour and preferences in relation to the product or service offered by the company
- New modes of communication
- New service needs that may emerge on the basis of social, economic or environmental changes

The Discover stage helps to identify the problem, opportunity or user need that should be addressed, and introduces the space within which design can provide a solution – the playing field for design. It is important that the design process used in the company allows for ideas to be captured and developed in this way, and fosters this type of creative environment among designers and other staff.

**source: [8]**
DOUBLE DIAMOND

DEFINE STAGE

- The generation of initial ideas and project development
- Ongoing project management
- Corporate objectives agreed and project sign-off

At the Define stage, a combination of the ideas or directions identified during the Discover stage are analysed and synthesised into a brief with actionable tasks related to new and existing product or service development. The Define stage ends with a clear definition of the problem(s) and a plan for how to address this through a design-led product or service. In practice, the Define stage ends in a project go-ahead through corporate level sign-off.

source: [8]
DESIGN STAGE

- Multi-disciplinary working and dependencies with other departments
- Visual management
- Development methods
- Testing
DELIVER STAGE

- Final testing, approval and launch
- Targets, evaluation and feedback loops.

It will result in a product or service that successfully addresses the problem identified during the Discover stage. It will also include processes for feeding back lessons from the full design process to inform future projects, including methods, ways of working and relevant information.

source: [8]
Double Diamond DESIGN PROCESS

GENERAL PROBLEM STATEMENT

RESEARCH
USER-CENTERED
EMPATHETIC

NEEDS/VALUES
TOUCH-POINTS

INSIGHTS

IDEATION
BRAINSTORM

SPECIFIC PROBLEMS

SPECIFIC SOLUTIONS

SPECIFIC SOLUTIONS

ITERATIVE PROCESS

DISCOVER

DEFINE

DEVELOP

DELIVER

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Permissions beyond the scope of this license may be available at http://creativecommons.org

source: [8]
User Experience Design I
(Interaction Design)

Day 3
Process Models and Usability - Continued
Appearance/Affordances
Appearance

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

Gibson explored the concept more fully in his 1979 book The Ecological Approach to Visual Perception, but it wasn’t until Don Norman’s seminal book The Psychology of Everyday Things, in 1988, that the term spread into design.

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]
Process Models, Elements and Usability

• Definition and Paradigms of UX/Interaction Design

• Process Models

• Elements of UX/Interaction Design

• Usability I
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
Step 2.)
evaluate paper prototypes

Parking Machine

http://www.flickr.com/photos/rdolishny/2760207306/
Phone/TV Card Charger

https://usabilityfail.org/telefon-und-fernsehkarten-im-krankenhaus-aufladen/

Wedding Planer

https://usabilityfail.org/registrieren-bitt/
Lock & Handle

https://usabilityfail.org/registrieren-bitte/

https://epicfail.com
OK Button

https://usabilityfail.org/ok-oder-nicht-ok/
Remote Control
Remote Control
Hierarchy of Design Needs
Maslow’s Hierarchy of Needs

Design Hierarchy of Needs

- Creativity
- Proficiency
- Usability
- Reliability
- Functionality

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.
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.
The diagram illustrates the design hierarchy of needs superimposed over Maslow's hierarchy of needs. The design hierarchy includes:

- Creativity
- Usability
- Reliability
- Functionality

At the bottom of the design hierarchy, highlighted in orange, is Proficiency. This is contrasted with Maslow's hierarchy, which includes:

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

The source of the diagram is [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.

source: [7]
Maslow’s Hierarchy of Needs

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

Design Hierarchy of Needs

- Functionality
- Reliability
- Usability
- Proficiency
- 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]
80/20 rule

A principle for setting priorities: users will use 20% of the features of your product 80% of the time. Focus the majority of your design and development effort (80%) on the most important 20% of the product.

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.

source: [7]
Flexibility-Usability Tradeoff

source: [7]
Navigation
How did I get here.....?
How did I get here.....?  How do you know.....?
How did I get here.....? > History lecture
iPhone

http://cdn3.pcadvisor.co.uk/cmsdata/reviews/3572846/iPhone_6_PLUS_preview_MG_1875.jpg

Navigation gives us something “to hold on”

It tells us what we will find and establishes a level of trust between the user and the people who build the system.

(Design: subject of the breakout-sessions)
Navigation structure

The entirety of all the way-finding elements/objects that the user is confronted with in order to find tools and usage objects.
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
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

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

Example: “Web Design, Filling the Blanks”
Visibility of system status

Match between system and the real world

User control and freedom

Consistency and standards

Error prevention

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Quelle: [3,7]
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Help and documentation

Mac OSX 10.5 (Screenshot)

Which one is right for me?

Use Windows when …
Use SNMP for …
SSH works best for …

Zenoss

Quelle: [3,7]
USABILITY Testing Applied

Recruiting Participants
Sample Size & Iterations
Testing Equipment
Field Test vs. Lab Test
Remote Testing
frequent users

novice users

expert users

infrequent users
Audi R15 Racing Cockpit

http://2.bp.blogspot.com/_SM9A_sq/GgM/S0XON6L_Wii/AAAAAAAADww/HcrQgfpuhgl/s1600/Audi+R15+Plus+Cockpit.jpg
Test 5 Users: Process
The mobile usability lab setting consisted of two different elements:

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

2. The observation was captured with an IBM laptop and the Tobii studio 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.
Eye-Tracking Glasses

- Full HD wide angle scene camera
- Gyro and accelerometer
- 2 cameras per eye
- Removable protective lens
- Exchangeable nose pad
- Microphone
Usability Testing in the Field
Usability Testing in the Field
Video Overview: Usability Testing in the Field
Collecting UX Data Remotely
Hallo ich bin Alex, wer bist du?

Nett dich kennenzulernen Sebi

Magst du mir noch ein wenig mehr über dich verraten?

Welches Geschlecht trifft am meisten auf dich zu?
- Weiblich
- Männlich
- Divers

Wie alt bist du?
- Unter 20
- 21–30
- 31–40
- 41–50
- 51–60
- Über 60
Hallo
ich bin Alex, wer bist du?

Wer bist du?

Dein Name

Fertig

Nett dich kennenzulemen
Usability Testing

Report contains:

- Study Design
- User Profiles
- Questionnaire Results
- Interview Quotes
- Summarised Findings
- Design Recommendations

> In the next session a closer look on common industry standards (CIF)
4.7 User group
Subset of intended users who are differentiated from other intended users by factors such as age, culture or expertise that are likely to influence usability.

4.8 Context of use
The users, tasks, equipment (hardware, software and materials), and the physical and social environments in which a product is used.

4.9 Goal
An intended outcome.

4.10 Task
The activities required to achieve a goal.

NOTE 1: These activities can be physical or cognitive.

NOTE 2: Job responsibilities can determine goals and tasks.

5 Report format

5.1 Title Page
The following information shall be provided:

a) Identify report as: Common Industry Format for Usability Test Report v2.0 and contact information (i.e., ‘Comments and questions about this format: iusr@nist.gov’).

b) Name the product and version that was tested.

c) Who led the test.
5.5.2.1 Performance Results

A table of results may be presented for groups of related tasks (e.g. all program creation tasks in one group, all debugging tasks in another group) where this is more efficient and makes sense. If a unit task has sub-tasks, then the sub-tasks may be reported in summary form for the unit task. For example, if a unit task is to identify all the misspelled words on a page, then the results may be summarized as a percent of misspellings found.

The following information should be provided:

a) Summary Table(s) of Performance Results across all tasks.

b) Graphical Presentation of Performance Results.

Additional tables of metrics should be included if they are relevant to the product’s design and a particular application area.

EXAMPLE TABLES

Task A

<table>
<thead>
<tr>
<th>User #</th>
<th>Unassisted Task Effectiveness [%Complete]</th>
<th>Assisted Task Effectiveness [%Complete]</th>
<th>Task Time (min)</th>
<th>...</th>
<th>Errors</th>
<th>Assists</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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<td>N</td>
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<td>Mean</td>
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<td>Standard Deviation</td>
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<td>Min</td>
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<td>Max</td>
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</tbody>
</table>

https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=151449
Double Diamond

Why? and How?

DISCOVER | DEFINE

DESIGN | DELIVER

source: [8]
User Experience Design

usable

useful
desirable
valuable
accessible
findable
credible

source: [3]

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http://semanticstudios.com
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.
Wireframes

https://medium.com/@xinyicui/ui-ux-strategy-a-guide-to-paper-prototype-sketching-3c475ce560f9

1. Lista ima neograničen broj predmeta
2. Slide efekt ponakće pristom
3. U listu i popraće se
4. Zaka i ikona kategorije
5. Razmisli?
6. Klikom na ikonu otvara se detaljan prikaz oglasa
7. Možda zamijeniti ovu z ekranu, da Home bude sa ikonama
8. Dodavanje vlastitih oglasa
9. Snimite ono što želite prodati
10. Postavite do 5 fotografija na naš server
11. Upišite tekst do 140 znakova i
12. Obavijestite i na
13. Državnom mrežama
14. Klikom na izradio
15. MJESTO
16. SNAGA
17. GODIŠTE
18. Cijena
19. Opis
20. ODGOVORI NA OGLAS
21. FAVORITE
22. ODGOVORI NA OGLAS
23. KATEGORIJA
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.
WHAT IS PAPER PROTOTYPING
Wireframes
...USING THE POP-APP
PAPER PROTOTYPING POP

• choose from a wide range of interface modules

• import your sketched wireframes

• turn sketches into clickable prototypes
PAPER PROTOTYPING BALSAMIQ
PAPER PROTOTYPING BALSAMIQ

• choose from a wide range of interface modules

• create fast low fidelity clickable prototypes
# Overview Sketch vs. Prototype

<table>
<thead>
<tr>
<th>Sketch</th>
<th>vs</th>
<th>Prototype</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provocative</td>
<td></td>
<td>Didactic</td>
</tr>
<tr>
<td>Suggest</td>
<td></td>
<td>Describe</td>
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<tr>
<td>Explore</td>
<td></td>
<td>Refine</td>
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<tr>
<td>Question</td>
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<td>Answer</td>
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<td>Propose</td>
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<td>Test</td>
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<td>Provoke</td>
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<td>Resolve</td>
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<tr>
<td>Tentative</td>
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<td>Specific</td>
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<tr>
<td>Noncommittal</td>
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<td>Depiction</td>
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# Overview UI Prototyping And Wire-framing Tools

<table>
<thead>
<tr>
<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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<tbody>
<tr>
<td><strong>Productivity</strong></td>
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<td>Learning Curve</td>
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<td><strong>Complex</strong></td>
<td><strong>Very Easy</strong></td>
<td><strong>Complex</strong></td>
<td>Average</td>
<td>Average</td>
<td>Easy</td>
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<td>Integrated Efficiency</td>
<td>Fast</td>
<td>Average</td>
<td>Fast</td>
<td>Slow</td>
<td>Average</td>
<td>Average</td>
<td>Fast</td>
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<tr>
<td>Interaction Design</td>
<td>Fast</td>
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<td>-</td>
<td>Average</td>
<td><strong>Plug-in Required</strong></td>
<td>Fast</td>
<td>-</td>
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<tr>
<td>Build Widgets</td>
<td>Fast</td>
<td>Slow</td>
<td>Fast</td>
<td>Average</td>
<td>Slow</td>
<td>Slow</td>
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<td>Device Testing</td>
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<td>Average</td>
<td><strong>Plug-in Required</strong></td>
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<td><strong>Fidelity</strong></td>
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<td>Visual Fidelity</td>
<td>Average</td>
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<td>Low</td>
<td>High</td>
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<tr>
<td><strong>Professional Skill Requirement</strong></td>
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<tr>
<td>Product Experience</td>
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<td>Basic Knowledge</td>
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<tr>
<td>Sharing</td>
<td><strong>Average</strong></td>
<td><strong>Great</strong></td>
<td><strong>Average</strong></td>
<td><strong>Great</strong></td>
<td>Great</td>
<td>Great</td>
<td>Great</td>
</tr>
</tbody>
</table>
There are days which occur in this climate, at almost any season of the year, wherein the world reaches its perfection, when the air, the heavenly bodies, and the earth, make a harmony, as if nature would indulge her offspring; when, in these bleak upper sides of the planet, nothing is to desire that we have heard of the happiest latitudes, and we bask in the shining hours of Utah and Colorado; when everything... that has life gives sign of satisfaction, and the cattle that lie on the ground seem to have overspread all the valley...
References (Books):