Interaction Design

Chapter 3 (May 11, 2017, 9am-12pm):
Approaches to IxD
Recap Session (Previous lecture): Process Models, Elements and Usability
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

source: [3]
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]
GRAPHIC DESIGN  
2D

PRODUCT DESIGN  
3D  
+Z-axis (spatial depth)

INTERACTION DESIGN  
4D  
+T-axis (temporal dimension)

SERVICE DESIGN  
5D  
+W-axis (multi-local simultaneity)

Model: Benjamin N.N. Schulz; Icons: Dima Yagnyuk, Daphne Espinosa, George Agpoon / The Noun Project
Problem: The creative process

source: [2]
Solution: Double Diamond

source: [2]
Double Diamond

source: [2]
Double Diamond DESIGN PROCESS

- **Discover**
  - General Problem Statement
  - Research
    - User-Centered
    - Empathetic
  - Needs/Values
    - Touchpoints
  - Insights

- **Define**
  - Specific Problems
  - Ideation
    - Brainstorm
  - Specific Solutions
    - Prototypes

- **Develop**

- **Deliver**

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Service Design Double Diamond Process by Kaishin Chu is licensed under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 International License. Based on a work at http://kaishinchu.com. Permissions beyond the scope of this license may be available at http://creativecommons.org.

UCD Design Process Model

Key Data Collection → User Research → Data Analysis → Design Concepts → Experience Prototypes

Evaluation Cycle

source: [2]
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.
"The Chasm"

Technology Adoption Lifecycle

Area under the curve represents number of customers

Innovators
Early Adopters
Early Majority
Late Majority
Laggards
Hobby

ENTHUSIAST PHASE
“Exploit me!”

Work

PROFESSIONAL PHASE
“Help me work!”

Life

CONSUMER PHASE
“Enjoy me!”

source: [3]
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
Deutsche Fassung

Ergonomische Anforderungen für Bürotätigkeiten mit Bildschirmgeräten
Teil 10: Grundsätze der Dialoggestaltung
(ISO 9241-10 : 1995)
3 Grundsätze der Dialoggestaltung


3.1 Aufgabenangemessenheit

Ein Dialog ist aufgabenangemessen, wenn er den Benutzer unterstützt, seine Arbeitsaufgabe effektiv und effizient zu erledigen.

<table>
<thead>
<tr>
<th>Empfehlungen:</th>
<th>möglich Beispiele:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Der Dialog sollte dem Benutzer nur solche Informationen anzeigen, die im Zusammenhang mit der Erledigung der Arbeitsaufgabe stehen.</td>
<td>Formatierungen wie z.B. Farbe und Informationen wie z.B. Wochentag, Datum usw. werden nur angezeigt, wenn sie die Erledigung der Arbeitsaufgabe erleichtern.</td>
</tr>
<tr>
<td>Die angezeigte Hilfe-Information sollte von der Aufgabe abhängen.</td>
<td>Wenn der Benutzer Hilfe aufruft, zeigt das Dialogsystem Informationen zur gegenwärtigen Aufgabe an (z.B. während des Editierens eine Liste der Editierbefehle).</td>
</tr>
<tr>
<td>Alle Aufgaben, die sinnvollerweise dem Dialogsystem zur automatischen Ausführung übertragen werden können, sollten durch das Dialogsystem ausgeführt werden, ohne den Benutzer damit zu belasten.</td>
<td>Wenn eine Dialog-Box angezeigt wird und der Benutzer Hilfe aufruft, zeigt das Dialogsystem Informationen zu dieser Dialog-Box an.</td>
</tr>
<tr>
<td>Bei der Gestaltung des Dialogs sollte der Komplexität der Arbeitsaufgabe unter Berücksichtigung der Fertigkeiten und Fähigkeiten des Benutzers Beachtung geschenkt werden.</td>
<td>Die Positionsmarke wird automatisch auf das erste Eingabefeld positioniert, das für die Arbeitsaufgabe relevant ist.</td>
</tr>
<tr>
<td></td>
<td>Startprozeduren des Systems laufen automatisch ab.</td>
</tr>
<tr>
<td></td>
<td>In einem öffentlich zugänglichen Dialogsystem wird dort, wo es eine Reihe alternativer Eingabemöglichkeiten gibt, ein Menü verwendet, um die</td>
</tr>
</tbody>
</table>
Interaction Design

Chapter 3 (May 11, 2017, 9am-12pm): Approaches to IxD
Approaches to Interaction Design

• The Purpose of Different Approaches

• Four Main Approaches
• User Centred Design (UCD)
• Activity Centred Design
• Systems Design
• Genius Design
Approaches to Interaction Design

- The Purpose of Different Approaches

- Four Main Approaches
  - User Centred Design (UCD)
  - Activity Centred Design
  - Systems Design
  - Genius Design
• can be used in many different situations to create vastly different products and services,
• e.g. Web sites, consumer electronics or nondigital services.
• move between approaches, applying the best approach to the right context
• sometimes applying multiple approaches even within a single project.
• problematic situations can be improved by developing at least one of these approaches
# Four Approaches to Design

<table>
<thead>
<tr>
<th>Approach</th>
<th>Overview</th>
<th>Users</th>
<th>Designer</th>
</tr>
</thead>
<tbody>
<tr>
<td>User-Centered Design</td>
<td>Focuses on user needs and goals</td>
<td>Guide the design</td>
<td>Translates user needs and goals</td>
</tr>
<tr>
<td>Activity-Centered Design</td>
<td>Focuses on the tasks and activities that need to be accomplished</td>
<td>Perform the activities</td>
<td>Creates tools for actions</td>
</tr>
<tr>
<td>Systems Design</td>
<td>Focuses on the components of a system</td>
<td>Set the goals of the system</td>
<td>Makes sure all the parts of the system are in place</td>
</tr>
<tr>
<td>Genius Design</td>
<td>Relies on the skill and wisdom of designers used to make products</td>
<td>Source of validation</td>
<td>Is the source of inspiration</td>
</tr>
</tbody>
</table>

source: [5]
Expert Mindset
“users” seen as subjects (reactive informers)

Participatory Mindset
“users” seen as partners (active co-creators)

Design-Led
- design-led with expert mindset
- design-led with participatory mindset

Research-Led
- research-led with expert mindset
- research-led with participatory mindset

source: [6+7]
Approaches to Interaction Design

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  • Systems Design
  • Genius Design
Case Study:

Paul Bradly

-designed the “Microsoft Mouse”
-followed an established
“User Centred Design Process” (UCD)
-helps Interaction Designers at IDEO
developing their prototypes

http://www.designinginteractions.com/interviews/PaulBradly

source: [3]
Looking back...
Key Data Collection → User Research → Data Analysis → Design Concepts → Experience Prototypes

Evaluation Cycle
Overview

source: [2]
User Centred Design (UCD)

Philosophy: Users know best

• People who will be using a product or service know what their needs, goals and preferences are

• Designers aren’t the users.

• Participation from users at every stage of the design process.

• Roots in industrial design and ergonomics: Industrial designer Henry Dreyfuss (Bell) popularised the method with his 1955 book “Designing for People”.

• Software designers were long time unaware of the method

source: [5]
• With increased memory and processor powers and color monitors different forms of interfaces were now possible.
• In the early 1980’s a movement began focusing on the users not on computers.

source: [5]
What is a user centred approach?

- User centred approach is based on:
  - Early focus on users and tasks: directly studying cognitive, behavioural, anthropomorphic & attitudinal characteristics
What is a user centred approach?

• User centred approach is based on:
  – **Early focus** on users and tasks: directly studying cognitive, behavioural, anthropomorphic & attitudinal characteristics
  – **Empirical measurement**: users’ reactions and performance to scenarios, manuals, simulations & prototypes are observed, recorded and analysed

source: [4]
What is a user centred approach?

- User centred approach is based on:
  - **Early focus** on users and tasks: directly studying cognitive, behavioural, anthropomorphic & attitudinal characteristics
  - **Empirical measurement**: users’ reactions and performance to scenarios, manuals, simulations & prototypes are observed, recorded and analysed
  - **Iterative design**: when problems are found in user testing, fix them and carry out more tests

source: [4]
Four basic activities

- Identifying needs and establishing requirements
Four basic activities

- Identifying needs and establishing requirements
- Developing alternative designs

source: [4]
Four basic activities

- Identifying needs and establishing requirements
- Developing alternative designs
- Building interactive versions of the designs
Four basic activities

- Identifying needs and establishing requirements
- Developing alternative designs
- Building interactive versions of the designs
- Evaluating designs

source: [4]
Summary:

- **Goals** are important in UCD -> interaction designer focus on what the user ultimately wants to accomplish.
- Interaction designer determines the user´s task and means necessary to achieve those goals -> always with the users needs and preferences in mind
- Interaction designers involve users at every stage of the process
- Users are consulted of the very beginning of a new project
- Interaction designers conduct extensive research (Chapter 4) up front to determine what the users goals are in the current situation
- Interaction Designers test and try prototypes of a system with users

- User data is a determining factor throughout the project when making decisions

source: [5]
Designing for Interaction: Creating Innovative Applications and Devices (Voices That Matter) [Taschenbuch]
Dan Saffer (Autor)

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Approaches to Interaction Design

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Case Study:

Jeff Hawkins

- worked with the team that developed the first laptop, the Compass by GRID
- developed the first tablet PC, the GRIDpad
- started PALM computing

http://www.designinginteractions.com/interviews/JeffHawkins

source: [3]
Looking back...
Activity Centred Design

- Philosophy: Activities as the main design focus
- Activities are a *cluster of actions and decisions* that are done for a purpose (*tasks*)
- The purpose of an activity is not necessarily a goal
- Purposes are more focused and tangible than goals

source: [5]
Case Study:

Dennis Boyle

-worked for a tech-consulting firm later known as the interaction design consultancy IDEO
-worked on the PalmPilot Os & Graffiti
-introduced the “Tech Box”

http://www.designinginteractions.com/interviews/DennisBoyle

source: [3]
Graffiti® Alphabet (•) Heavy dot indicates starting point.

ABCDEFGHIJKLMNOPQRSTUVWXYZ 0123456789

space  back  space  return  caps  shift  caps  lock

RSTUVWXYZ  ——/!'

Punctuation Shift = tap once  (Write → to exit a shift mode.)

., ? - ! / () . ; : " & $ %

http://www.flickr.com/photos/youraccount/5594456000/
• The difference between a task and an activity can be fairly minor

• Some tasks have enough parts to be considered as sub activities themselves

• Like UCD, activity centred design relies on research as the basis for its insights, albeit not as heavily

• Interaction designers catalog users’ activities and tasks which leads to a specific design solution to help users accomplish the task, not to achieve a goal per se

• The activity, not the people doing the activity guides the design process

source: [5]
A danger in activity centred design is that designers might not look for solutions for the problem as a “whole”
(Not see the forest for the trees)
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Systems Design

• Analytical method of approaching design problems

• A set of entities that act upon each other is center of the design process

• Systems can range from simple (heating system in a house) to the enormously complex (power-plant)

• Systems design is a structured, rigorous design methodology

• Excellent for tackling complex problems

• Holistic design approach (focus on the context of use)

• Systems design outlines the components that systems should have: A goal, a sensor, a comparator and an actuator (these parts are shaped by the interaction designer)

• Compared to other approaches systems design provides a clear roadmap for designers to follow

source: [5]
705 ALMA ST.

ALL SYSTEMS NORMAL
01:53P Wed 09/04/02
The Goal states the **ideal relationship** between the system and the environment it lives in.
Systems Design

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source: [5]
Flow Diagram

Represent a series of events, actions or processes of different actors. Usually have a beginning and an end point.
Systems Design

• What is the environment?

• What goal does the system have in relation to its environment?

• What is the feedback loop by which the system corrects its actions?

• How does the system measure whether it has achieved its goal?

• Who defines the system, environment, goals and monitors it?

• What resources does the system have for maintaining the relationship it desires?

• Are the resources sufficient to meet the systems purpose?
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• Genius Design
Genius Design

• Philosophy: Design relies almost solely on the wisdom and experience of the interaction designer making the design decisions.

• Probably best practiced by experienced designers who have encountered several types of problems and can draw solutions from previous design issues

source: [5]
"Great design is as much about prospecting in the past as it is about inventing the future."

Bill Buxton
Beau Brownie Camera 1930

iPod Shuffle 2004

source: [8]
"A mobile device with a touch interface and only one physical button?"
IBM Simon 1993

Apple iPhone 2007

source:[8]
References (Books):


References (Papers):


Articles: