Lecture 2
Chapter 1 part 2 - What is interaction design?

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Overview

- Discussion of Team Project Assignment 1 (P1) - Find a Project
- Interaction Design (ID) process introduction
- from Usability to User eXperience (UX)
- Design rules and principles

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Discussion of Team Project Assignment 1 (P1)

- **Team Project Assignment 1 (P1) - Find a Project**
  - See https://users.cs.fiu.edu/~lisetti/hci/projects.html

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Interaction Design Process introduction

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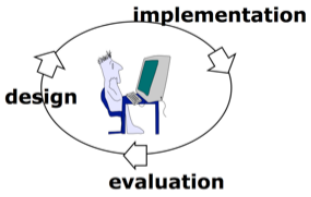
What is involved in the process of interaction design?

- Establishing requirements
- Developing alternatives
- Prototyping
- Evaluating



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Core characteristics of Interaction Design

- Users should be involved through the development of the project
- Specific **usability** and **user experience** goals need to be
  - identified
  - clearly documented and
  - agreed at the **beginning** of the project
- **Iteration** is needed through the core activities

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Why go to this length?

- Help designers
  - understand how to **design interactive products that fit** with what people
    - want, need and may desire
  - appreciate that **one size does *not* fit all**
    e.g., teenagers are very different to grown-ups
  - identify any **incorrect assumptions** they may have about particular user groups
    e.g., *not* all old people want or need big fonts
  - be aware of both **people's**
    - **sensitivities** and
    - their capabilities

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Are cultural differences important?

- 5/21/2015 versus 21/5/2015?
  - Which should be used for international services and online forms?
- What other cultural conventions that can be relevant in a user interface?

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Accessibility

- Degree to which a product is usable and accessible by as many people as possible
- Focus on disability
  - have a mental or physical impairment
  - this has an adverse affect on their everyday lives
  - it is long term

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Anna, IKEA online sales agent

- Designed to be different for UK and US customers
- What are the differences and which is which?
- What other differences could you envision would help improve the UI, and why do you think so?

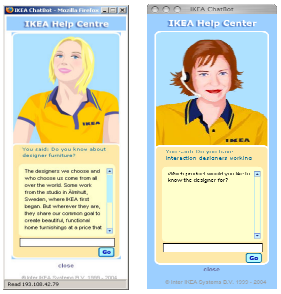

Figure 1.7 Anna the online sales agent, designed to be subtly different for UK and US customers. What are the differences and which is which? What should Anna's appearance be like for other countries, like India, South Africa, or China?
Source: Reproduced with permission from IKEA Ltd.

from Usability to User eXperience (UX)

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Why worry about UX?

- Ubiquitous interaction
- Usage by very young to really old
- Rise of demand for usability
- Evolving concept of usability to richer concept of user experience

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From Usability to UX

- **Usability** (also known as usability engineering) has always been about
  - making usage **easy** for everyone
  - making everyone **productive** in usage

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Six (6) usability goals

1. Effective to use
2. Efficient to use
3. Safe to use
4. Have good utility
5. Easy to learn
6. Easy to remember how to use

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Interaction Design and User Experience

- Progression of a maturing discipline
  - **from**
    - narrow focus on **task performance**
  - **to**
    - overarching characteristics of ***entire*** **user experience**
- More recently, **user experience goals** concerned with
  - explicating the nature of the user experience
  - e.g. to be aesthetically pleasing

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Changing concept of computing

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Changing concept of interaction

"The world is not a desktop" — Tscheligi, 2005 (paraphrasing Mark Weiser)

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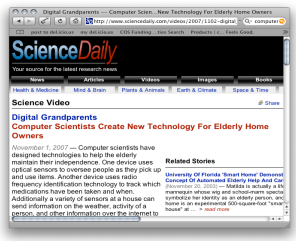
From very young to really old

- Age of youngest effective computer user?
- Age of oldest computer users?



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User experience

- Many aspects of UX to consider
- Central importance
  - usability
  - functionality
  - aesthetics
  - content
  - look and feel
  - sensual
  - emotional appeal
- Also other wide-reaching aspects, including
  - fun,
  - health,
  - social capital
    - the social resources that develop and are maintained through social networks, shared values, goals, and norms
  - cultural identity,
    - e.g. age, ethnicity, race, disability, family status, occupation, education.

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User experience goals

- Cover a range of emotions and felt experiences

Desirable aspects

satisfying	helpful	fun
enjoyable	motivating	provocative
engaging	challenging	surprising
pleasurable	enhancing sociability	rewarding
exciting	supporting creativity	emotionally fulfilling
entertaining	cognitively stimulating	

Undesirable aspects

boring	unpleasant
frustrating	patronizing
making one feel guilty	making one feel stupid
annoying	cutesy
childish	gimmicky

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Rising importance of UX

- From
  - having to cost-justify usability
- to
  - having UX drive the industry
- Explosion of **UX case studies**
- Increased **intolerance** for bad design
- **Upsurge** of interest in design
- **Awareness** and demand from marketing
- **Industry** adoption of need for design for UX
- Rich and fast expanding research areas

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Usability and user experience goals

- Selecting terms to convey a person's feelings, **emotions**, etc.,
  - can help designers understand the multifaceted nature of the user experience
- *How do usability goals differ from user experience goals?*
- Are there trade-offs between the two kinds of goals?
  - e.g. can a product be both fun and safe?
- How easy is it to **measure**
  - usability
  - versus user experience goals?

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How is User Experience more than Usability?

- User experience is
  - the **totality** of effects **felt** by user
  - as result of **interaction** with
    - system, device, or product
    - within usage context
- User experience does *not* replace usability
  - usability still essential
  - **now usability is part of user experience**
  - usability is pragmatic component
- Components of UX
  - usability
  - usefulness
  - emotional impact

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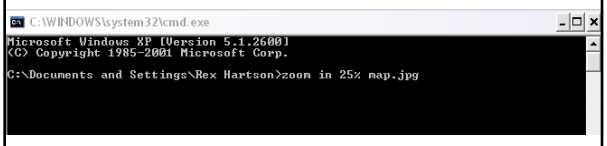
from Usability to User eXperience - Example

- The progression of thinking about **usability**
- An example:
  - User to **zoom** in on map image
  - Old days
    - **command language input**



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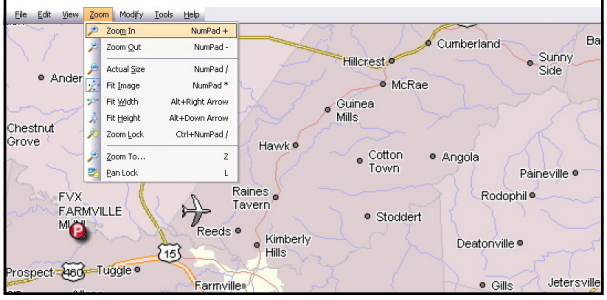
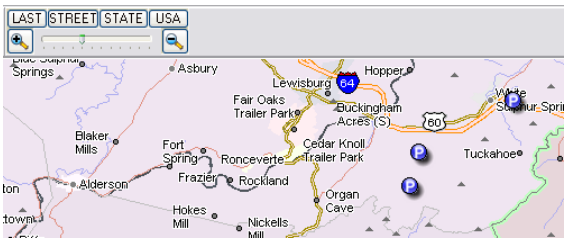
from Usability to User eXperience - Example

- Command via **pull-down menu**



from Usability to User eXperience - Example

- **Direct manipulation**, click on "+" or "-" icon



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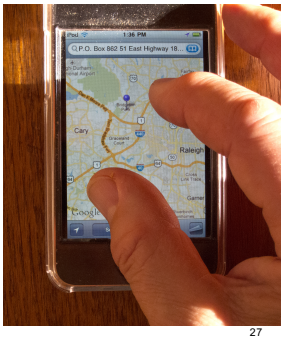
from Usability to User eXperience - Example

- Embodied,
- finger gesture
- multi-touch

- Makes you realize that
  - direct manipulation with a mouse
  - is not so direct



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Branding is part of UX

- Icons, logos, brands
- Can mean much more than just the product they represent

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Design Principles

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Design Principles

- Design principles are
  - generalizable **abstractions** for thinking about different aspects of design
  - **do's and don'ts** of interaction design

- Derived from a **mix** of
  - theory-based knowledge
  - experience and
  - common-sense

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Golden rules and Heuristics

- "Broad brush" design rules
- Useful **check list** for good design
- **Better** design using these than using nothing!
- Different collections e.g.
  - Nielsen's ten Heuristics (see Preece's Chapter 9)
  - Shneiderman's eight (8) Golden Rules
  - Norman's seven (7) Principles

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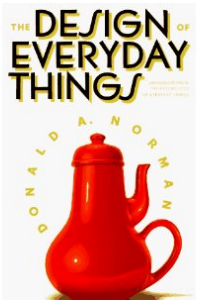
Design Principles

- Norman (1988) *The Design of Everyday Things*
  1. Visibility
  2. Feedback
  3. (Mapping)
  4. Constraints
  5. Consistency
  6. Affordance



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Visibility

- Try to ensure that things are visible so that people can see
  - what **functions** are available and
  - what the system is **currently doing**
- This is an important part of the **psychological** principle that
  - it is easier to recognize things than to have to recall them
- If it is not possible to make it visible
  - make it **observable**
- Consider making things 'visible'
  - through the use of **sound and touch**

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Visibility example in Screen design

- Screen design is a key issue in such environments
- Attention needs to be paid to the **layout** of objects on a screen
- Avoiding **clutter** will help to ensure **visibility**
- Attention needs to be paid to the use of
  - appropriate, non-clashing colors and
  - careful layout of information using tables, graphs or text
- However on **mobile** windows applications **visibility** is very difficult to achieve

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Visibility

- This is a control panel for an elevator
- How does it work?
- Push a button for the floor you want?
  - Nothing happens
- Push any other button?
  - Still nothing
- What do you need to do?
- It is not visible as to what to do!

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Visibility

...You need to insert your room card in the slot by the buttons to get the elevator to work!

- How would you make this action more visible?
  - make the card reader more **obvious**
  - provide an **auditory** message, that says what to do (which language?)
  - provide a **big label** next to the card reader that flashes when someone enters
  - make **relevant** parts visible
  - make what has to be done **obvious**

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What do I do if I am wearing black?

- **Invisible automatic** controls can
  - make it more **difficult** to use

Figure 1.10 A sign in the restrooms at Cincinnati airport. Because it is not visible to the user as to what to do to turn the faucet (tap) on and off, a sign has been added to explain what is normally an everyday and well-learned activity. It does not explain, however, what to do if you are wearing black clothing

Feedback

- Sending **information back to the user** about what has been done
- Includes
  - sound
  - highlighting
  - animation and
  - combinations of these
    - e.g. when screen button clicked on, provides sound or red highlight feedback

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Constraints

- **Restricting** the possible actions that can be performed
  - e.g. **greying out** items on a menu that are not relevant at a particular point
- Helps **prevent** user from selecting **incorrect options**
- **Physical** objects can be designed to constrain things
  - e.g. only one way you can insert a key into a lock

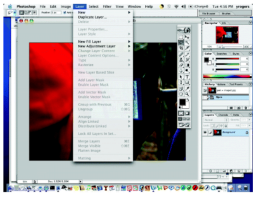

Figure 1.11 A menu showing restricted availability of options as an example of logical constraining. Shaded areas indicate deactivated options

Source: Adobe product box shot reprinted with permission from Adobe Systems Incorporated.

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Logical or ambiguous design?

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- Where do you plug the mouse?
- Where do you plug the keyboard?
- Top or bottom connector?
- Do the colour coded icons help?

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How to design them more logically

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- **Design A**
  - provides direct adjacent mapping between icon and connector
- **Design B**
  - provides colour coding to associate the connectors with the labels

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Consistency

- Design interfaces to
  - have **similar** operations and use similar elements for similar tasks
    - e.g. always use ctrl key plus first initial of the command for an operation
    - ctrl+C, ctrl+S, ctrl+O
- Main benefit is consistent interfaces are **easier to learn and use**

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When consistency breaks down

- What happens if there is **more than one command** starting with the same letter?
  - e.g. save, spelling, select, style
- Have to find other initials or combinations of keys, thereby breaking the consistency rule
  - e.g. ctrl+S, ctrl+Sp, ctrl+shift+L
- Increases learning **burden** on user, making them more prone to **errors**

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Internal and external consistency

- **Internal** consistency refers to
  - designing operations to behave the same **within** an application
  - difficult to achieve with complex interfaces
- **External** consistency refers to
  - designing operations, interfaces, etc., to be the same **across** applications and devices
  - very rarely the case, based on different designer's preference

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A case of **external** inconsistency

- Keypad numbers layout

(a) phones, remote controls

1	2	3
4	5	6
7	8	9
	0	

(b) calculators, computer keypads

7	8	9
4	5	6
1	2	3
0		

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Affordances: to give a clue

- Refers to an **attribute** of an object that allows people to know **how to use** it, e.g.
  - a door handle affords pulling
  - chairs afford sitting on
  - post-it notes afford writing a message on and sticking next to something else
  - a mouse button invites pushing: make buttons look like buttons so people will press them
- Affordances are **culturally** determined
- In interaction design how to design interface objects, e.g.
  - scrollbars to afford moving up and down
  - icons to afford clicking on

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What does 'affordance' have to offer interaction design?

- Interfaces
  - are virtual and
  - do not have affordances like physical objects
- Norman argues it does not make sense to talk about interfaces in terms of 'real' affordances
- Instead interfaces are better conceptualized as '**perceived**' affordances
- Learned conventions of arbitrary **mappings** between action and effect at the interface
- Some mappings are better than others

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Virtual affordances

- How do the following screen objects afford?
- What if you were a novice user?
- Would you know what to do with them?




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Summary of design rules

Principles for **usability**

- **repeatable** design for usability relies on
  - maximizing benefit of one good design
  - by abstracting out the general properties which can direct purposeful design
- success of designing for usability requires both
  - creative insight (new paradigms) and
  - purposeful principled practice

Using design rules

- **standards** and **guidelines** to direct design activity

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Key points

- Interaction design is concerned with
  - designing interactive products
  - to support the way people communicate and interact in their everyday and working lives
- It is concerned with how to create quality user experiences
- It requires taking into account a number of interdependent factors, including
  - context of use
  - type of activities
  - cultural differences and
  - user groups
- It is multidisciplinary
  - involving many inputs from wide-reaching disciplines and fields

Credits: some of the slides in this lecture were borrowed from Dr. Cosley's HCI course.

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Assignments

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Assignments for next class

- Reading assignments
  - Chapter 1 (skim only)
  - Lecture notes on Chapter 1 (read fully)
  - Chapter 9 – Process of Interaction Design
- Quiz 1
  - since you have to read Chapter 9 for next week,
  - Quiz 1 will be solely on the content of these Lecture Notes on Chapter 1
  - i.e. it will *not* on be material from the book on Chapter 1, that is not in this set of Lecture Note slides

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