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

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CAP 4104 / CAP 5109

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

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

Interaction Design Process introduction

What is involved in the process of interaction design?
• Establishing requirements
• Developing alternatives
• Prototyping
• Evaluating

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
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 sensibilities and their capabilities

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?

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

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?

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
From Usability to UX

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

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

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

Changing concept of computing

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

Changing concept of interaction

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

• Many aspects of UX to consider
• Central importance
  • usability
  • functionality
  • aesthetics
  • content
  • look and feel
  • 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.

User experience goals

• Cover a range of emotions and felt experiences

<table>
<thead>
<tr>
<th>Desirable aspects</th>
<th>Helpfulness</th>
<th>Fun</th>
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<table>
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<th>Stupid</th>
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<td>making one feel guilty</td>
<td>making one feel stupid</td>
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<tr>
<td>childish</td>
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</table>

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

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?

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

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
from Usability to User eXperience - Example

• Command via pull-down menu

from Usability to User eXperience - Example

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

from Usability to User eXperience - Example

• Embodied,
  • finger gesture
  • multi-touch
  • Makes you realize that
  • direct manipulation with a mouse
  • is not so direct

Branding is part of UX

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

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
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

Design Principles

  1. Visibility
  2. Feedback
  3. (Mapping)
  4. Constraints
  5. Consistency
  6. Affordance

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

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

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!

Visibility example

- 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 when inserting a card
  - make the card reader that flashes when someone enters
  - make relevant parts visible
  - make what has to be done obvious
What do I do if I am wearing black?

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

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

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.

Logical or ambiguous design?

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

How to design them more logically

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

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+V, ctrl+D.
- Main benefit is consistent interfaces are easier to learn and use.
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+t.

• Increases learning **burden** on user, making them more prone to errors

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

A case of external inconsistency

• Keypad numbers layout

<table>
<thead>
<tr>
<th></th>
<th>(a) phones, remote controls</th>
<th>(b) calculators, computer keyboards</th>
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</thead>
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</table>

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

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

Virtual affordances

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

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.

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