(Ch 1, 10) Usability Goals
Effectiveness

Efficiency
Safety

Utility
Learnability

Memorability
(Ch 2) What is an assumption?

- Take for granted when shouldn’t
  - e.g. TV while driving

(Ch 9) Degrees of user involvement:
Four issues with users

- Want sophisticated ideas too late
- Non-constructive participation
  - Fear of job loss or worsening job conditions
- Don’t care/understand software dev issues
- Higher aspirations
  - Hence higher levels of stress
  - Unnecessary conflicts
  - Increased reworking
(Ch 2) Paradigm

- General approach adopted by a community for carrying out research
  - Assumptions
  - Concepts
  - Values
  - Practices

- Ex:
  - Desktop
  - Ubiquitous computing

(Ch 5) Sources of Frustration: Error Message Guidelines
State how to fix

http://www.papajohn.org/MM2-Importing-Video-MPEG2.html

Help icon/command

(Ch 7) Key Issues: Triangulation

Data: Time

Data: Place

http://starwars.wikia.com/wiki/Stormtrooper

Data: People

http://starwars.wikia.com/wiki/Stormtrooper,
http://kotaku.com/5650591/then-why-we-still-got-ewoks,
Investigator

Theory

Perceptual

Cognitive

Motor
Methodology

Triangulation

Other methods

(Ch 7) Direct observation in controlled environment

http://starwars.wikia.com/wiki/Stormtrooper
(Ch 9) How to choose among alternatives

- **External**
  - What designers focus on
  - Visible
  - Measurable

- **Internal**
  - Hidden from user’s view
  - Need to dissect

(Ch 9) Approaches to ID

- **User-centered design**
  - User is only guide

- **Activity-centered design**
  - User’s behavior
  - User still plays significant role
(Ch 9) Approaches to ID

- Systems design
  - System of people, computers, objects, etc.
  - Focus on context
  - User’s role is to set goals
  - Good for complex systems

- Genius design
  - Only designer

• (Ch 3) Recall
  - Remember something without clues
  - Can be hard to do
    - Passwords

• Recognition
  - Remember via reencounter
  - Easier to do than recall
(Ch 3) Memory: Search

- Start with recall
- Move on to recognition
- Can improve via
  - Multiple encodings
  - Autofill
  - Searchbox AND history list

(Ch 3) Memory: What not to do

- Only 7 menu options
- Display only 7 tool bar icons
- No more than 7 bullets in a list
- Only 7 items on pull down menu
- Only 7 tabs at the top of a webpage

- Wrong because recognition, not recall!
(Ch 3) Memory: Activity

- Grandparents’ birthdays
- Cover of last two bought DVDs
- Which easiest? Why?
- Good at remembering visual cues
  - Color
  - Location
  - Marks
- Harder to remember arbitrary material
  - Birthdays
  - Phone numbers

(Ch 12) Formative evaluation

1. Drive car to gas pump
2. Take nozzle from pump....
3. ...and put it into the car’s gas tank
4. Squeeze trigger on the nozzle until tank is full
5. Replace nozzle when tank is full
6. Pay cashier
(Ch 12) Summative evaluation

http://blog.busbank.com/fuel-surcharge-sweeping-industry/

(Ch 10) Task description: Use cases

(Ch 10) Task description: Essential use cases

(Ch 10) Example essential use case for travel organizer

retrievest Visa

<table>
<thead>
<tr>
<th>USER INTENTION</th>
<th>SYSTEM RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>find visa requirements</td>
<td>request destination and nationality</td>
</tr>
<tr>
<td>supply required information</td>
<td>obtain appropriate visa info</td>
</tr>
<tr>
<td>obtain copy of visa info</td>
<td>offer info in different formats</td>
</tr>
<tr>
<td>choose suitable format</td>
<td>provide info in chosen format</td>
</tr>
</tbody>
</table>
(Ch 1, 10) Usability Goals

Effectiveness
Efficiency

www.id-book.com,

Safety

www.id-book.com,
http://www.bigshinyrobot.com/reviews/archives/23540
Utility

Learnability
Memorability

(Ch 1) User experience (UX) goals

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
(Ch 1) Design principles

- Do’s and don’ts of interaction design
- Derived from
  - Theory-based knowledge
  - Experience
  - Common-sense

Visibility
- Easy to find things
- Ex:

- Non-Ex:

From:
www.baddesigns.com
Feedback

- Send info back to user about what was done
- Includes
  - Sound
  - Highlighting
  - Animation
- Ex: Previous → “ccclichhk”
- Non-Ex: Shower

Constraints

- Restricting possible actions
- Prevents selection of incorrect options
- Ex:
  - Insert a key into a lock
- Non-Ex:
Consistency

- Similar operations and similar elements for similar tasks
- Easier to learn and use
- Ex: ctrl key plus first initial of the command (ctrl+C, ctrl+S, ctrl+O)

Internal consistency

- Behave the same within an application
- Difficult with complex interfaces
- Ex:
  - Non-Ex: Modes (Caps Lock, Photoshop)
External consistency

- Behave the same across applications and devices
- Pertains to operations, interfaces, etc.
- Very rarely the case
  - Based on different designer’s preference
- Ex:
- Non-Ex:

(a) phones, remote controls

(b) calculators, computer keypads

Affordances

- Attribute of an object that suggests use
- Physical (‘Real’) Affordances
  - Direct mapping between action and effect
  - Ex:
    - Mouse button invites pushing
    - Door handle affords pulling
- Virtual (‘Perceived’) Affordances
  - Learned conventions of arbitrary mappings between action and effect
  - Some mappings are better than others
  - Ex:
    - Scrollbars to afford moving up and down
    - Icons to afford clicking on
(Ch 1) When consistency breaks down

- These slides
- >1 command starts with same letter
  - Ex: Save, spelling, select, style
  - Must find other initials or combo of keys
  - Breaks the consistency rule
- Increases learning burden
  - People more prone to errors

(Ch 1) When consistency gets in the way

- Ex: Windows 8
(Ch 3) Perception: Gestalt laws

- Mind tends to perceive patterns
- Groupings based on certain rules
- Relative strength not really known

**Perception: Gestalt laws**

- Core principle:
- **Pragnanz**
  - Regular, simple, orderly
Perception: Gestalt laws

• Proximity – Close together

• Too much whitespace can be detrimental

Perception: Gestalt laws

• Similarity
Perception: Gestalt laws

• Similarity

![Toy Sales Chart](image)

Perception: Gestalt laws

• Closure – Incomplete shapes
Perception: Gestalt laws

• Symmetry

[ ] { } [ ]

Perception: Gestalt laws

• Common fate – All moving same way
Perception: Gestalt laws

- Continuity – Continuous direction

Perception: Gestalt laws

- Past experience

www.id-book.com,

www.id-book.com,
http://www.scholarpedia.org/article/Gestalt_principles
Perception: Gestalt laws

• Convexity

Perception: Gestalt laws

• Common region
Perception: Gestalt laws

- Element connectedness

(Ch 2) Interaction types

- Way user interacts with product
  - Instructing
    - Issuing commands
    - Selecting options
  - Conversing
    - Interacting with system via “conversation”
  - Manipulating
    - Interacting with objects via manipulation
  - Exploring
    - Moving through environment
(Ch 2) Best interaction type

- **Instruction**
  - Repetitive actions on multiple objects
  - Ex: spell-checking, file management

- **Manipulation**
  - ‘doing’ types of tasks
  - Ex: drawing, flying, driving, sizing windows

- **Conversation**
  - Children
  - Computer-phobic
  - Disabled users
  - Specialised applications
    - Phone services

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(Ch 6) Interface types

<table>
<thead>
<tr>
<th>Interface type</th>
<th>See also</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Command-based</td>
<td>WIMP and web</td>
</tr>
<tr>
<td>2. WIMP and GUI</td>
<td>Augmented and mixed reality</td>
</tr>
<tr>
<td>3. Multimedia</td>
<td>Multimedia</td>
</tr>
<tr>
<td>4. Virtual reality</td>
<td>Mobile and multimedia</td>
</tr>
<tr>
<td>5. Information visualization</td>
<td>Mobile</td>
</tr>
<tr>
<td>6. Web</td>
<td>Augmented and mixed reality</td>
</tr>
<tr>
<td>7. Consumer electronics and appliances</td>
<td></td>
</tr>
<tr>
<td>8. Mobile</td>
<td></td>
</tr>
<tr>
<td>9. Speech</td>
<td>Shareable, touch</td>
</tr>
<tr>
<td>10. Pen</td>
<td>Shareable, air-based gesture</td>
</tr>
<tr>
<td>11. Touch</td>
<td>Tangible</td>
</tr>
<tr>
<td>12. Air-based gesture</td>
<td>Multimodal</td>
</tr>
<tr>
<td>13. Haptic</td>
<td>Speech, pen, touch, gesture, and haptic</td>
</tr>
<tr>
<td>14. Multimodal</td>
<td>Touch</td>
</tr>
<tr>
<td>15. Shareable</td>
<td>Virtual reality</td>
</tr>
<tr>
<td>16. Tangible</td>
<td></td>
</tr>
<tr>
<td>17. Augmented and mixed reality</td>
<td></td>
</tr>
<tr>
<td>18. Wearable</td>
<td></td>
</tr>
<tr>
<td>19. Robotic</td>
<td></td>
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<tr>
<td>20. Brain–computer</td>
<td></td>
</tr>
</tbody>
</table>
(Ch 6) 3. Multimedia

- Combine media within single interface
  - Various forms of interactivity
  - Graphics, text, video, sound, and animations
  - Differs from GUI because includes web

- Ex: BioBlast

- Popular for
  - Education/Training
  - General Browsing

(Ch 6) Pros and cons

- The Good
  - Rapid access to multiple representations of info
  - Whole can be better than the parts
  - Can enable
    - Easier learning/understanding
    - More engagement/pleasure
  - Encourage exploration
  - Tendency to explore multiple elements at once

- The Bad
  - Promotes fragmented interactions
    - Fix: Require text to be read before continuing
(Ch 6) 9. Speech

- Person converses with system
- Ex: Apple’s Siri
- Popular for
  - Basic inquiry
  - Call routing
  - The blind and visually impaired
- The Good
  - Not limited by input device
- The Bad
  - Limited by tech (Natural Language Processing)

(Ch 7) Key Issues: Identifying Participants
Convenience sampling

http://starwars.wikia.com/wiki/Stormtrooper

Random sampling

http://starwars.wikia.com/wiki/Stormtrooper
Identifying Participants

Stratified sampling

http://starwars.wikia.com/wiki/Stormtrooper
http://kotaku.com/5650591/then-why-we-still-got-ewoks,

(Ch 7) Data Recording:
Types
Notes plus still camera

Audio plus still camera
Video

(Ch 7) Interview Types
Interview Types

Unstructured

http://starwars.wikia.com/wiki/Stormtrooper

Structured

http://starwars.wikia.com/wiki/Stormtrooper
Semi-structured

http://starwars.wikia.com/wiki/Stormtrooper

(Ch 8) Overall system

(Ch 9) Who are the users?

Primary  Secondary  Tertiary

Compromises

(Ch 11)
Low-fidelity vs. high-fidelity