

Design

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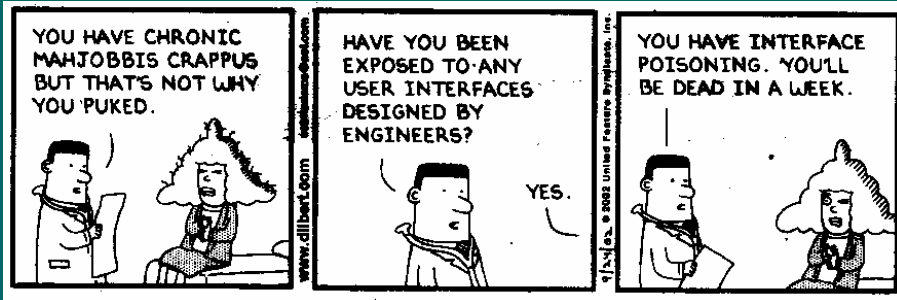
Agenda

- Design challenges
- Idea generation
- Design principles

- Graphic design



Design



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Design

- Is it easy?

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Difficulties

- Good design can be very challenging
- Why?



Why is Design Difficult?

- 1. Increasing complexity/pressure
 - Number of things to control has risen dramatically
 - Display is increasingly symbolic/artificial
 - Feedback is more complex and subtle
 - Errors are increasingly serious/costly

**Norman
revisited**



Why Difficult?

- 2. Marketplace pressures
 - Time is money
 - Adding functionality (complexity) is now easy and cheap
 - Adding controls/feedback is expensive
 - Design usually requires several iterations before success



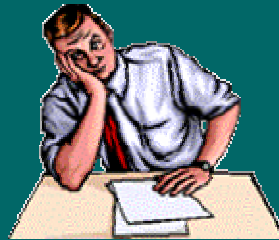
Why Difficult?

- 3. People often consider cost and appearance over human factors design
 - Style over substance
 - Bad design may not be visible



Why Difficult?

- 4. Creativity is challenging
 - Can't just make a copy
 - Want creativity, but want pragmatism



Idea Creation

How do we create and develop new interface ideas and designs?

- Ideas come from
 - Imagination
 - Analogy
 - Observation of current practice
 - Observation of current systems
- Borrow from other fields
 - Animation
 - Theatre
 - Information displays
 - Architecture
 - ...



Interface Metaphors

- *Metaphor* - Application of name or descriptive term to another object which is not literally applicable
 - Use: Natural transfer - apply existing knowledge to new, abstract tasks
 - Problem: May introduce incorrect mental model



Idea Creation

- Other methods for creating and developing interface ideas
 - ?



Idea Creation Methods

- 1. Consider new use for object
- 2. Adapt object to be like something else
- 3. Modify object for a new purpose
- 4. Magnify - add to object
- 5. Minimize - subtract from object
- 6. Substitute something similar
- 7. Rearrange aspects of object
- 8. Change the point of view
- 9. Combine data into an ensemble



Overall Guidelines for Design

- 1. Provide a good conceptual model
 - User has mental model of how things work
 - Build design that allows user to predict effects of actions
- 2. Make things visible
 - Visible affordances, mappings, constraints
 - Remind person of what can be done and how to do it

Norman's advice



Design Guidelines/Principles

- General guidelines (advice) to help create more usable systems



&



- Can be subtle, even contradictory



Design Principles

- 1. Use simple and natural dialog in user's language
 - Match user's task in a natural way
 - Avoid jargon, techno-speak

Insufficient funds to
withdraw \$100

VS.

X.25 connection discarded due
to network congestion. Local
limits now in effect

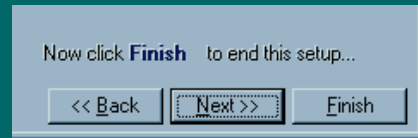
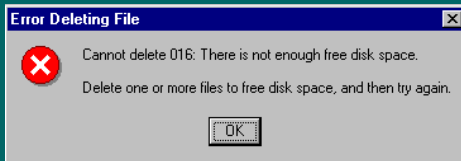
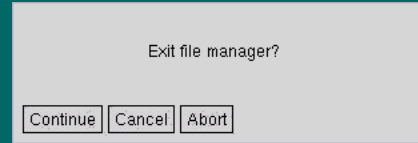
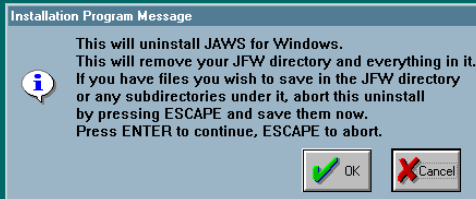
- Present exactly info that user needs

Less is more!

Fewer unnecessary windows, prompts, dialogs

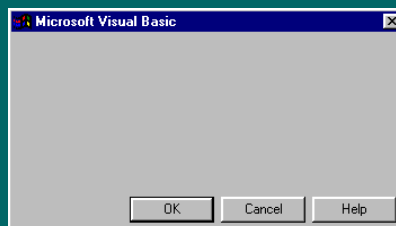


"Fun" Examples



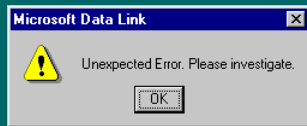
Design Principles

- 2. Strive for consistency
 - Sequences, actions, commands, layout, terminology
 - Makes more predictable



Design Principles

- 3. Provide informative feedback
 - Continuously inform user about what is occurring
 - Most important on frequent, substantive actions



- How to deal with delays?



Design Principles

- 4. Minimize user's memory load
 - Recognition is better than recall
 - Describe required input format, include example and default

Date __ - ___ - __ (DD-Mmm-YY, e.g., 02-Aug-93)

- Use small # of generally applicable commands



Design Principles

- 5. Permit easy reversal of actions
 - Undo!
 - Reduces anxiety, encourages experimentation



Design Principles

- 6. Provide clearly marked exits
 - Don't want the user to feel trapped
 - Examples
 - Cancel button on dialogs
 - Interrupt/resume on lengthy operations (modeless)
 - Quit - can exit anytime
 - Reset/defaults - restore on a property sheet



Design Principles

- 7. Provide shortcuts
 - Enable frequent users to perform often-used operations quickly
 - Keyboard & mouse
 - abbreviations
 - menu shortcuts
 - function keys
 - command completion
 - double click vs. menu selection
 - Navigation between windows/forms
 - Reuse
 - Provide history system



Design Principles

- 8. Support internal locus of control
 - Put user in charge, not computer
 - Can be major source of anxiety

Enter next command

VS.

Ready for next command



Design Principles

- 9. Handle errors smoothly and positively
- 10. Provide useful help and documentation
 - (More to come later in course on these two)



Good & Bad Designs

- www.baddesigns.com
- www.iarchitect.com



Graphic Design

Let's explore the details more...

Who Needs Substance When You've Got Style?



Graphic Design

- The “look & feel” portion of an interface
- What someone initially encounters
 - Conveys an impression, mood

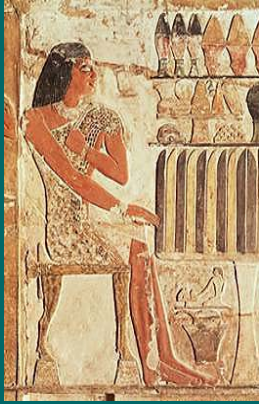


Graphic Design

- It shares aspects of design practices in engineering and CS, but focuses on the cultural, symbolic & affective aspects.
- “useful, usable, desirable”



Graphic Design



- As a practice, it has been around for thousands of years.



Graphic Design



- With the industrial revolution, art and design began to diverge
- Design for mass-production - of printing, of artifacts



Graphic Design

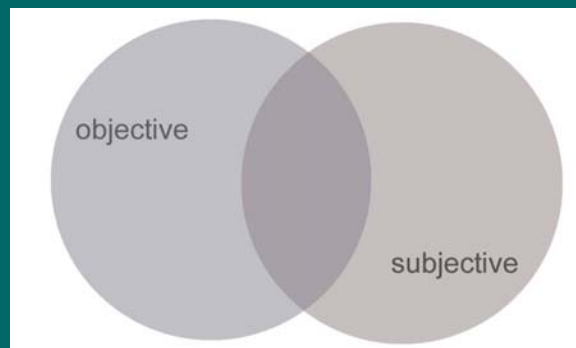


- In the US, graphic design developed into a profession after WWII



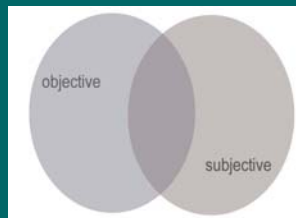
Graphic Design

- Relies on a BALANCE and integration of:



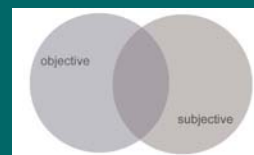
Graphic Design

- **Objective:** relies on quantitative studies, like usability testing
- Does the “look” work?



Graphic Design

- **Subjective:** “look” relies on subjective judgement by experts, and depends on contextual factors
- “look” is contextual, based on culture
 - Culture is learned
 - Cultural meanings change
 - There can be multiple meanings
- Uniqueness is valued (not programmable)



Graphic Design

- You cannot empirically measure the subjective aspects, but there is a discipline to its study



Graphic Design

- Is rigorous in its own realm
 1. Graphic Design experts
 - vs.
 2. Applying graphic design principlesOur goal in this course



Graphic Design

- **So what?**
- Knowing graphic design principles will:
 - Enhance your ability to communicate w/designers
 - Enable you to create more user-friendly interfaces



Design Philosophies

- My personal preferences:
 - Economy of visual elements
 - Less is more
 - Clean, well organized

Sequencing

Layout

Imagery

Color

Organization

Typography



Graphic Design Principles

- Metaphor
- Clarity
- Consistency
- Alignment
- Proximity
- Contrast



Metaphor

- Tying presentation and visual elements to some familiar relevant items
 - e.g., Desktop metaphor
 - If you're building an interface for a grocery application, maybe mimic a person walking through a store with a cart



Example



Overdone?

www.worldwidestore.com/Mainlv1.htm

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Clarity

- Every element in an interface should have a reason for being there
 - Make that reason clear too!
- Less is more

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Clarity

- White space
 - Leads the eye
 - Provides symmetry and balance through its use
 - Strengthens impact of message
 - Allows eye to rest between elements of activity
 - Used to promote simplicity, elegance, class, refinement



Example

Clear, clean appearance

Opinion?



Consistency

- In layout, color, images, icons, typography, text, ...
- Within screen, across screens
- Stay within metaphor everywhere
- Platform may have a style guide
 - Follow it!

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Example



Home page



Content page 1



Content page 2

www.santafean.com

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Alignment

- Western world
 - Start from top left



- Allows eye to parse display more easily
- “Read-flow” principle



Alignment

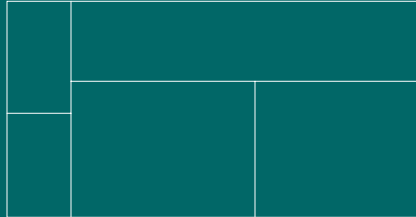
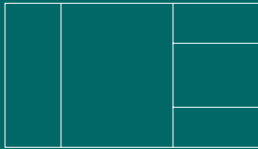
- Grids
 - (Hidden) horizontal and vertical lines to help locate window components
 - Align related things
 - Group items logically

- Minimize number of controls, reduce clutter

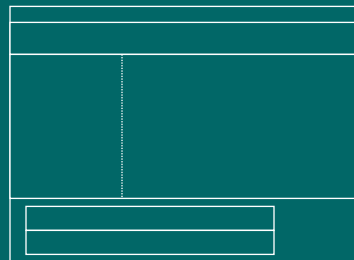


Alignment

- Grids - use them



Grid Example



Alignment

- Left, center, or right

Here is
some
new text

Here is
some
new text

Here is
some
new text

- Choose one, use it everywhere
- Novices often center things
 - No definition, calm, very formal



Proximity

- Items close together appear to have a relationship
- Distance implies no relationship

Time

Time:



Example

Name
Addr1
Addr2
City
State
Phone
Fax

Name	<input type="text"/>
Addr1	<input type="text"/>
Addr2	<input type="text"/>
City	<input type="text"/>
State	<input type="text"/>
Phone	<input type="text"/>
Fax	<input type="text"/>

Name
Addr1
Addr2
City
State
Phone
Fax



Contrast

- **Pulls you in**
- Guides your eyes around the interface
- Supports skimming

- Take advantage of contrast to add focus or to energize an interface
- Can be used to distinguish active control



Contrast

- Can be used to set off most important item
 - Allow it to dominate
- Ask yourself what is the most important item in the interface, highlight it
- Use geometry to help sequencing

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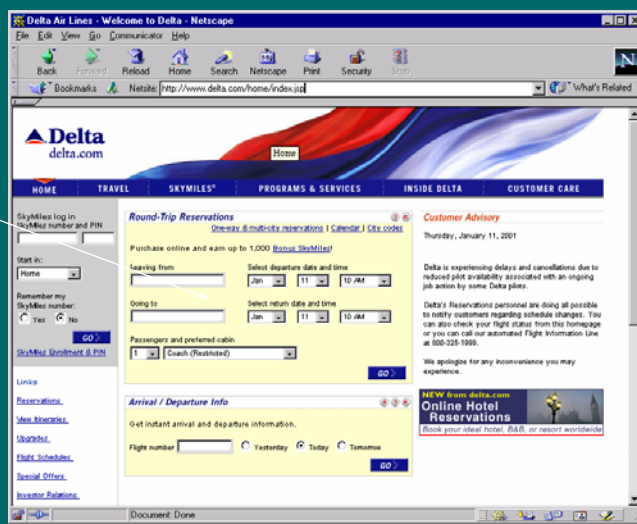


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Example

Important element

Old
www.delta.com



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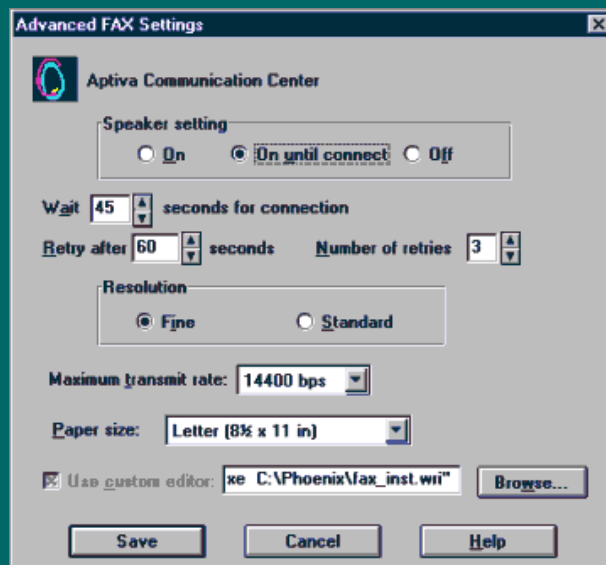
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UI Exercise

- Look at interface and see where your eye is initially drawn (what dominates?)
- Is that the most important thing in the interface?
- Sometimes this can (mistakenly) even be white space!



Example



Disorganized



Example

Form Title :: (appears above URL in most browsers and is used by WWW search)		Background Color:
Q&D Software Development Order Desk		FFFBF0
Form Heading :: (appears at top of Web page in bold type)		Text Color:
Q&D Software Development Order Desk		000080
E-Mail responses to (will not appear on)	Alternate (for mailto forms only)	Background Graphic
dversch@q-d.com		
Text to appear in Submit button	Text to appear in Reset button	<input type="radio"/> Mailto
Send Order	Clear Form	<input checked="" type="radio"/> CGI
Scrolling Status Bar Message (max length = 200 characters)		
****WebMania 1.5b with Image Map Wizard is here!****		
<< Prev Tab		Next Tab >>

Visual noise



Example

Exporting

Form to Export:

Export to Access Database

Export to text file (CSV)

Purge responses from original table

Overuse of
3D effects



Economy of Visual Elements

- Less is more
- Minimize borders and heavy outlining, section boundaries (use whitespace)
- Reduce clutter
- Minimize the number of controls



Coding Techniques

- Blinking
 - Good for grabbing attention, but use **very** sparingly
- Reverse video, bold
 - Good for making something stand out
 - Again, use sparingly



Project Part 1

- Questions?
- Due on Thursday (2 copies, at start of class)



Upcoming

- Continuing graphic design
- Prototyping

