Sketching and Storyboarding

CS160: User Interfaces
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Error Messages

Sorry, a system error has occurred.
10 - 02
Error Dialog Boxes

Why are they problematic?

How related to locus of attention?

What are the alternatives?
  – Make errors as impossible as possible
    • Pull down of state codes rather than typing in codes …
    • Handle all possible types of input
What happens when you cancel a cancelled operation?

Do I have any choice in this?

Umm, thanks for the warning, but what should I do?

Uhhh… I give up on this one

Inane Dialog Boxes
"HIT ANY KEY TO CONTINUE"
Review: The Action Cycle

start here

Goals

Execution
- Intention to act
- Sequence of actions
- Execution of actions

Evaluation
- Evaluation of interpretations
- Interpreting the perception
- Perceiving the state of the world

The World

Review: Metaphor
Review: Metaphor

Direct Manipulation

An interface that behaves as though the interaction was with a real-world object rather than with an abstract system

Central ideas

- Visibility of the objects of interest
- Rapid, reversible, incremental actions
- Manipulation by pointing and moving
- Immediate and continuous display of results
Review: Cognition

Cognetics
- Ergonomics of the mind
- Study of “engineering scope of our mental abilities”

Cognitive Conscious/Unconscious
- What is the last letter in your first name?

Locus of Attention
- Idea/object/event which you are intently thinking about
- Focus implies volition; locus not always consciously controlled

Due Next Time (before class)

Contextual Inquiry and Task Analysis
- Should be done with interviews
- Performing task analysis
- Designing interface

- Submit on web and …
- Hand in printout at beginning of class
More Announcements

Group Brainstorm (20 pts)
- Mean 18.64
- Stdev 1.10

Office Hours
- Maneesh: Tue/Th 5-6pm, and by appointment
  • Soda Hall 635

Topics
- Error Messages
- Modes
- Depicting Processes
- Storyboarding
Modes

Modes: Definition

What are they?

- The same user actions have different effects in different situations.
- Examples:
  - Keycaps lock
Search Interface Desiderata

How do we build an interface that successfully supports both direct search and browsing? The press is full with accounts of failed searches and unhappy users. For example, a recent report by Forrester Research found that 70% of firms rate search as "extremely important" only 28% consider their Web site's search to be "extremely useful" (6).

In our view, the way to do things correctly is to use the evidence found in the results of usability studies of search systems. Unfortunately, most studies of search behavior are inconclusive about how to improve the system (for example, (12)), but some consistencies do emerge about what works. Here, we summarize which search features tend to work well, and which fail, in practice. Throughout this article, the assumption is that the user population is composed of reasonably accurate and if the interface is carefully designed. Some examples of such features include automatic query expansion, and simple relevance feedback (also known as "more like this"), in which the user selects one item and the system shows items that are similar in scope along several dimensions.

COMMUNICATIONS OF THE ACM  September 2003/Vol. 46, No. 9  43

FLAMENC0 Starting Page

Search for

Micro View

COMMUNICATIONS OF THE ACM  September 2003/Vol. 46, No. 9  43
Using Modes in Interfaces

When are they useful?
- Temporarily restrict users’ actions
- When logical and clearly visible and easily switchable
  - Drawing with paintbrush vs. pencil
  - Autocorrect (if easy to switch the mode)

Why can they be problematic?
- Big memory burden
- Source of many serious errors

How can these problems be fixed?
- **Don’t use modes – redesign system to be modeless**
- Redundantly visible

Redesigning to Avoid Modes

Setting the time on a clock

![Modal interface](image)
Redesigning to Avoid Modes

Setting the time on a clock

Modes are Sometimes Good

Fill and empty syringe
Modes are Sometimes Good

When task requires switching modes, interface may also contain modes

**Fill Mode**

![Fill Syringe](image1)

- Vol: 50, 100, 150, 200
- Current Vol: 25ml
- Max Vol: 200ml

**Deliver Mode**

![Deliver Solution](image2)

- Vol: 50, 100, 150, 200
- Rate: 10, 20, 30, 40
- Current Vol: 25ml

Quasimodes

Set *and hold* a mode via conscious, continuous action

- Shift key to capitalize (vs. Caps Lock)
- Foot pedal that must remain pressed
- Pull down menus
- Muscle tension reminds users they are holding a mode

Also known as “spring-loaded modes”
Noun-Verb VS Verb-Noun

Noun-Verb: Select object, then perform action
– Emphasizes 'nouns' (objects) rather than 'verbs' (actions)

Verb-Noun: Select action, then choose object to perform on
– Emphasizes verbs' (actions) rather than nouns' (objects)

Advantages of Noun-Verb
– Error reduction: Verb-noun requires selecting action (mode) then applying it
– Actions always within context of object
  • Inappropriate actions can be hidden

Depicting Processes
What is a Process?

Process: A series of actions or operations conducing to an end
– Series ➔ Time
– End ➔ Goal
Lego Assembly Instructions

Putting on a tie
Creating the Narrative

Process: A series of actions or operations conducing to an end
1. Choose the goal
2. Plan ordered set of actions to achieve goal
3. Depict each action

Breaking Goal Into Tasks/Actions

- What is unit of action?
- Sub-steps within steps

Wordless Workshop [Doty 96]
Planning

• Which actions?
• What order?

![Diagram of dressing operations]

Operations required to dress
[based on Cormen et al. 90]

Depiction

Visual instructions for learning disabled

Peanut butter & Jelly Sandwich
Get 2 slices of bread.
Open peanut butter.

Spread peanut butter.
Put lid back on.
Open jelly.

Spread jelly on bread.
Put lid back on jelly.
Put together

[Orth 01]
Building a Lego Fire Truck
1. Start with 2 x 20 black piece
2. Turn over and attach 2 x 2 black piece flush with left side. Attach another 2 x2 black piece 2 studs in from the right side.
3. Turn right side up and attach 1 x 4 red piece …

Words and Images

Words
- Labeling / Annotation
- Verbs (actions)
- Adverbs, Some adjectives
- Abstract concepts

Images (Very important for interface design)
- Visual / physical properties
- Spatial relationships
- Actions indicated by diagrammatic conventions
- Images allow for graphic conversations (QC514A.mov)
- Loose diagrams are especially useful early on (QC515A.mov)
Storyboarding
In Interface Design

Troops

See http://www.theforce.net/theater/shortfilms/troops/
Comics

Storyboarding for Interfaces

Technique

- Series of frames depicting key steps in reaching a goal
  - Can use a pin board for easy rearrangement/editing
- Describe the interaction in context
  - Often useful to show user in at least 1st frame (establishing shot)
  - Relationship between the user and its environment
  - Relationship between the user and the system
Sketch: Single Display

Sketch: Single Display
Sketch: Single Display

Film Editing Interface
Storyboards: Multiple Frames

Scenario 1

"I want to listen to alternative music"

[Diagram of storyboards with multiple frames]

Storyboards: Multiple Frames

[Another diagram with storyboards and frames]
Test Storyboards with Users

Can be “played” in front of users (or other designers)

Check understanding of process users go through
  – Observe user reaction
  – Debrief users

Good reference point during the design process