Dialog Design

The topic :

How does a user interact with the interface?

Dialog Style

1. Command languages
2. WIMP - Window, Icon, Menu, Pointer
3. Direct manipulation
4. Speech/Natural language, audio
5. Gesture, pen, VR

Dialog Style

1. Command Languages

- **Earliest UI interaction paradigms**
- **Examples**
  - **MS-DOS shell**
  - **UNIX shell**
  - **dBase**
  - **GPSS**

- **CL Attributes**
  - **Work primarily by recall, not recognition**
  - **Heavy memory load**
  - **Little or nothing is visible**
    so…
  - **Poor choice for novices**
    but...
  - **Advantages for experts ?**

CL Advantages

- **Advantages for experts**
  - **Speed, conciseness**
    - **%ls (hard to beat)**
  - **Can express actions beyond a limited set**
    - **Flags, piping one command to another**
  - **Repetition, extensibility**
    - **Scripting, macros**
  - **Easier implementation, less overhead**
  - **Power**
    - **Abstraction, wild cards**

CL Danger

- With added power, comes added responsibility and danger
  - **UNIX**
    - **% rm -r ***
    - **Deletes every file that you have, and you can't get them back**

CL Reflection

- **Command languages are often maligned (for good reason)**
- **But increased functionality can win out over bad UI (e.g., UNIX)**
  - **Try to get both**
  - **Avoid excess functionality (comes at cost)**

CL Design Goals

- **Consistency**
- **Good naming and abbreviations**

- **Doing your homework in design can help alleviate some of the negatives**

Consistency

- **Provide a consistent syntax**
  - **In general: Have options and arguments expressed the same way everywhere**
  - **UNIX fails here because commands were developed by lots of different people at different organizations**
    - **No guidelines provided**

Order

- **English: SVO subject verb object**

  "you" assumed on computer

- **CL: S assumed (you)**
  - **Is VO or OV better?**

  % delete file
  or
  % file delete

- **V dO iO vs. V iO dO**
  - **% print file calvin**
  - **% lpr -Pcalvin file**

  Which is better?

Syntax

- **Pick a consistent syntax strategy**
  - **Simple command list**
    - **e.g, vi, minimize keystrokes**
  - **Commands plus arguments**
    - **realistic, can provide keyword parameters**
    - **% cp from=foo to=bar**
  - **Commands plus options plus arguments**
    - **what you usually see**

Terminology

- **Keep terminology consistent**
  - **Same concept expressed with same options**
  - **Useful to provide symmetric (congruent) pairings**
    - **forward/backward**
    - **next/prev**
    - **control/meta**

Example :

- **vi text editor**
  - **w - forward word**
  - **b - backward word**
- **Wouldn't 'f' be better for forward?**
  - **'f' already used**
- **How about 'fw' and 'bw'?**
  - **Extra keystrokes**

Ordering

- **Keep ordering consistent**
  - **VO seems to be the most natural**
  - **Typically need to pick where options go**

- **Example**
  - **% ln -s file1 file2 (I can never remember)**
  - **Think of % cp file1 file2**

Names and Abbreviations

- **Specificity versus Generality**
  - **General words**
    - **More familiar, easier to accept**
  - **Specific (typically better)**
    - **More descriptive, meaningful, distinctive**
  - **(Nonsense does surprisingly well in small set)**

Abbreviations

- **Abbrevs. allow for faster actions**
  - **Expert performance begins to be dominated by motor times such as # of keystrokes**
  - **Not good idea for novices**
  - **(Allow but don't require)**

Picking Good Abbreviations

- **Strategies**
  - **Simple truncation (works best, but conflicts)**
  - **Vowel drop plus truncation (avoid conflicts)**
  - **First and last letters**
  - **First letters of words in a phrase**
  - **Standard abbrev from other contexts**
    - **qty, rm, bldg**
  - **Phonics**
    - **xqt**

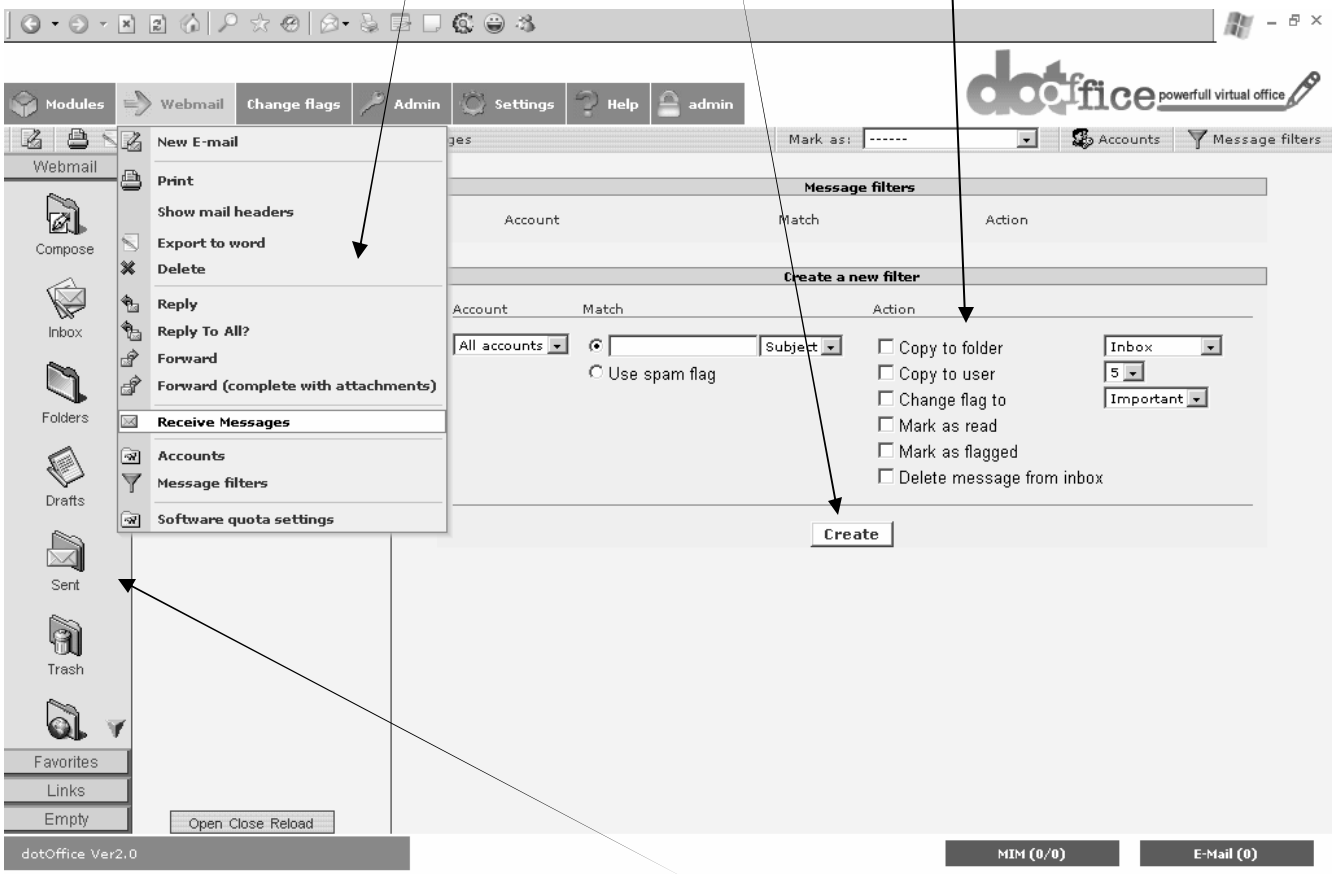
Abbreviation Guidelines

- **Use single primary rule (with single fallback for conflicts)**
- **Use fallback as little as possible**
- **Mark use of fallback in documentation**
- **Let user know primary and secondary rules**
- **Truncation is good but generates conflicts**
- **Fixed length is better than variable length**
- **Don’t use abbrevs. in system output**

Dialog Style

2. WIMP

- Focus: Menus, Buttons, Forms



- icon

Menus

- **Key advantages:**
  - **1 keystroke or mouse operation vs. many**
  - **No memorization of commands**
  - **Limited input set**
- **Many different types**
  - **pop-up**
  - **pull-down**
  - **radio buttons**
  - **pie buttons**
  - **hierarchies**

Menu Items

- **Organization strategies**
  - **Create groups of logically similar items**
  - **Cover all possibilities**
  - **Ensure that items are non-overlapping**
  - **Keep wording concise, understandable**

- **Bad Example**
  - **Travel web page links:**
    - **Flight page**
    - **3 Best Itineraries**
    - **Flights & Prices**
    - **Timetables**
    - **Fares**
  - **Which do you choose for reservations?**

Presentation Sequence

- **How does Mac, Netscape, etc, do it?**

- **Use natural if available**
  - **Time**
    - **e.g. Breakfast, Lunch, Dinner**
  - **Numeric ordering**
    - **e.g. Point sizes for font**

- **Choices**
  - **Alphabetical**
  - **Group related items**
  - **Frequently used first**
  - **Most important first**

Presentation Sequence

- **User studies**
  - **Novices: alpha > functional > random**
  - **Experts: categorization**
- **How would you do it in general?**
- **One possible methodology (first->last)**
  - **Natural order (if exists)**
  - **Frequency of use**
  - **Order of use**
  - **Categorical**
  - **Alphabetical**
- **Don’t change dynamically!**

Dialog Style

3. Direct Manipulation

DEFINITION

1) Continuous visibility of the objects and actions of interest

2) Rapid, reversible, incremental actions whose effect is immediately noticeable

3) Replacement of command language syntax by direct manipulation of object of interest (physical actions, buttons, etc.)

DM Ex & Essence

- Examples
  - WYSIWYG editors and word processors
  - VISICALC - 1st electronic spreadsheet
  - CAD
  - Desktop metaphor
  - Video games
- Representation of reality that can be manipulated
- The user is able to apply intellect directly to the task
- The tool itself seems to disappear

Direct Manipulation

ADVANTAGES

- Easier to learn & remember, particularly for novices
- Direct WYSIWYG
- Flexible, easily reversible actions helps reduce anxiety in users
- Provides context & instant visual feedback so user can tell if objectives are being achieved
- Exploits human use of visual spatial cues
- Limits types of errors that can be made

Direct Manipulation

DISADVANTAGES

- Screen space intensive (info not all that dense)
- Need to learn meaning of components of visual representation
- Visual representation may be misleading
- Mouse ops may be slower than typing
- Not self-explanatory (no prompts)
- Not good at
  - Repetition
  - History keeping (harder)
  - Certain tasks (Change all italics to bold)
  - Abstract elements (variables)
  - Macros harder

What is DM?

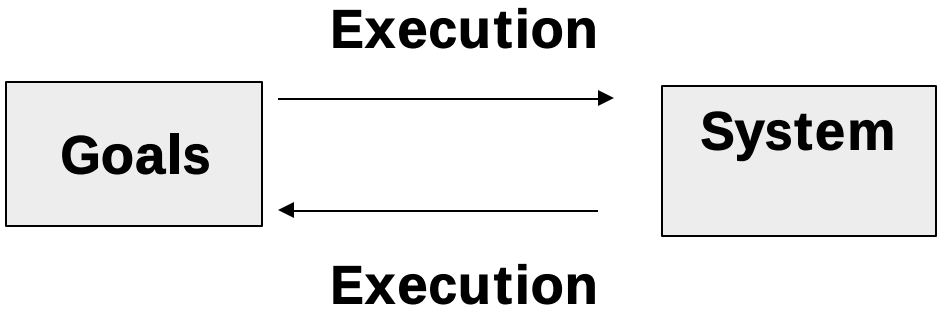
- Word? Emacs?

More Psychological View

- What is directness? (not always done well)
- Related to two things:
  - Distance
  - Engagement

Distance

- Two gaps or “gulfs” between user’s goals and system image
- Directness partly depends on the distance between these two gulfs
  - Gulf of execution
  - Gulf of evaluation



Gulfs

- Gulf of execution
  - Distance between user's goals and means of achieving them in system
    - **Does the system allow the user to do what they want?**
- Gulf of evaluation
  - Amount of effort person must expend to interpret system state and judge if intention was achieved
    - **Can use perceive if progressing favorably?**

Directness and Distance

- **Two types**
  - **Semantic - Relation between what user want to express and what is available in interface**
    - **Can I say what I want (concisely)?**
  - **Articulatory - Relation between meanings of expressions and their physical form(s)**
    - **Is the way to perform an action expected and clear (appropriate)?**

Engagement

- **Feeling that you are directly manipulating the objects of interest**
- **Promoted by**
  - **Unobtrusive interface**
  - **Minimizing gulfs of execution and evaluation**
  - **Appropriately responsive system**