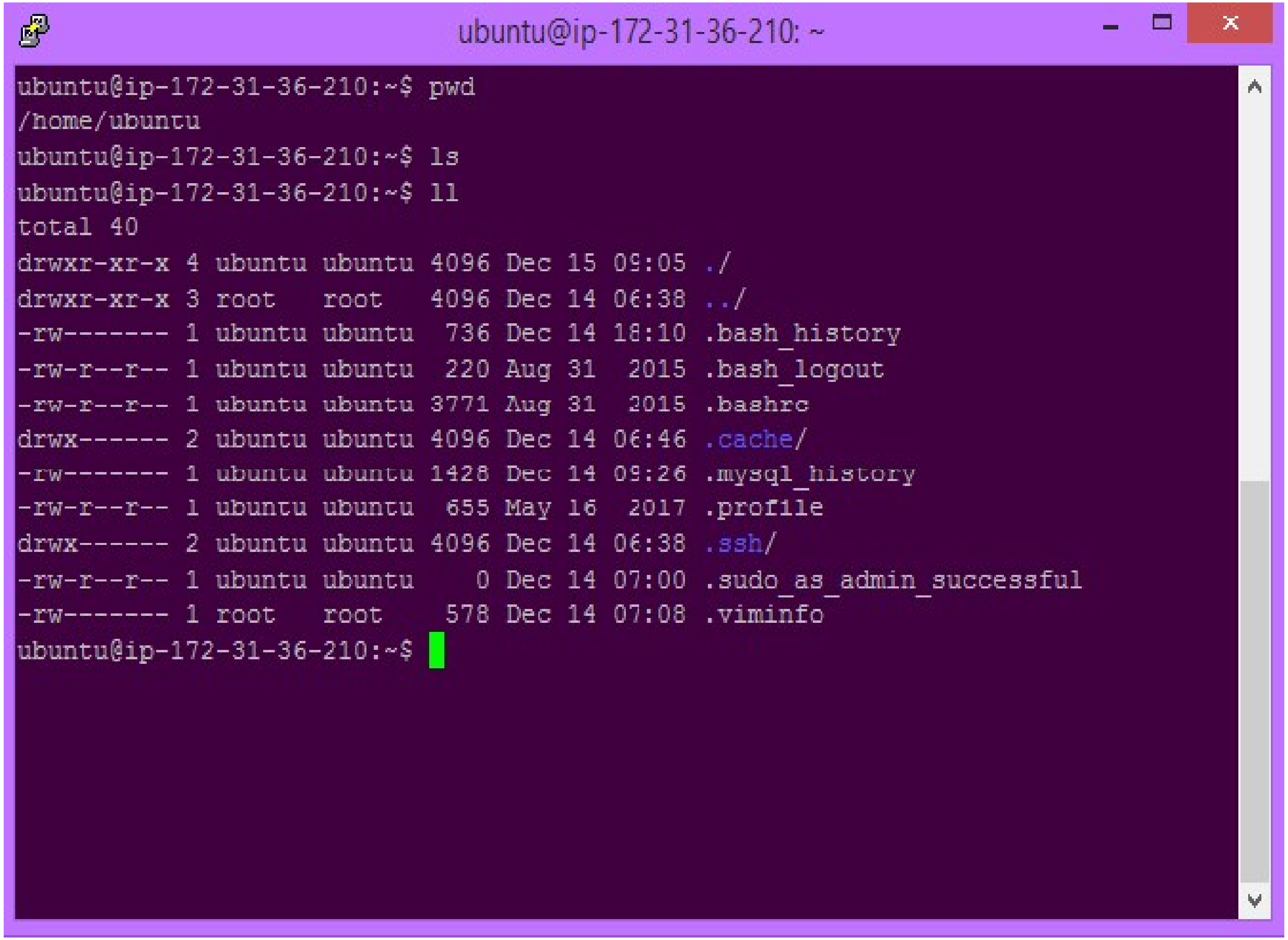
INTERACTION STYLES

- ✓ ways the user can **communicate or otherwise interact** with the computer system.
- ✓ roots in the computer medium-workstation or a desktop .
- ✓ retain some of their descriptive powers outside the computer medium. menu selection (defined below) in mobile phones.
- ✓ types of interaction styles -- command language, form fillin, menu selection, and direct manipulation
- ✓ Command language -- cognitive burden on the user in that the interaction style relies on recall as opposed to recognition

INTERACTION STYLES

- ✓ **Command language (or command entry)**
- ✓ earliest form of interaction style and is still being used, -- mainly on Linux/Unix operating systems.
- ✓ "Command prompts" typical by expert users who type commands ; possibly some parameters that will affect the way the command is executed.
- ✓ following screen dump shows a command prompt –
- ✓ **user has executed the ls command** followed by its file listing.



```
ubuntu@ip-172-31-36-210:~$ pwd
/home/ubuntu
ubuntu@ip-172-31-36-210:~$ ls
ubuntu@ip-172-31-36-210:~$ ll
total 40
drwxr-xr-x 4 ubuntu ubuntu 4096 Dec 15 09:05 ./
drwxr-xr-x 3 root   root   4096 Dec 14 06:38 ../
-rw------- 1 ubuntu ubuntu  736 Dec 14 18:10 .bash_history
-rw-r--r-- 1 ubuntu ubuntu  220 Aug 31  2015 .bash_logout
-rw-r--r-- 1 ubuntu ubuntu 3771 Aug 31  2015 .bashrc
drwx------ 2 ubuntu ubuntu 4096 Dec 14 06:46 .cache/
-rw------- 1 ubuntu ubuntu 1428 Dec 14 09:26 .mysql_history
-rw-r--r-- 1 ubuntu ubuntu  655 May 16  2017 .profile
drwx------ 2 ubuntu ubuntu 4096 Dec 14 06:38 .ssh/
-rw-r--r-- 1 ubuntu ubuntu    0 Dec 14 07:00 .sudo_as_admin_successful
-rw------- 1 root   root    578 Dec 14 07:08 .viminfo
ubuntu@ip-172-31-36-210:~$
```

- CLI - cognitive burden on the user interaction style
- relies on recall as opposed to recognition memory. Commands , parameterised options have to be learned by heart ; (how far this rote learning will continue!!)
- user given no help in retrieving command names from memory.
- task NO easier --many commands like the 'ls‘ are abbreviated - minimize the number of necessary keystrokes when typing commands.
- learnability of command languages is generally very poor.
- MS-DOS (Microsoft Disk Operating System),
- CP/M (Control Program for Microcomputers) and
- Apple DOS (Apple Disk Operating System)
- And s not to forget the $ prompt of UNIX /& its clone!

Pros and Cons of CLI

- **Advantages**
- Flexible. Faster interaction if command is known well
- Appeals to expert users.
- Supports creation of user-defined "scripts" or macros.
- suitable for interacting networked computers -low bandwidth.
- much less memory (Random Access Memory) in order to use viz other types of UI.
- low resolution, cheaper monitor can be used
- CLI does not require Windows to run

Pros and Cons of CLI

- **Disadvantages**
- Retention of commands is generally very poor.
- Learnability of commands is very poor.
- Error rates are high.
- Error messages / assistance are hard to provide -diversity of possibilities -complexity of mapping from tasks to interface concepts / syntax.
- Not suitable for non-expert users.
- someone who has never used a CLI, it can be very confusing.
- mis-type an instruction, most often start from scratch again.

FORM FILL IN INTERFACES

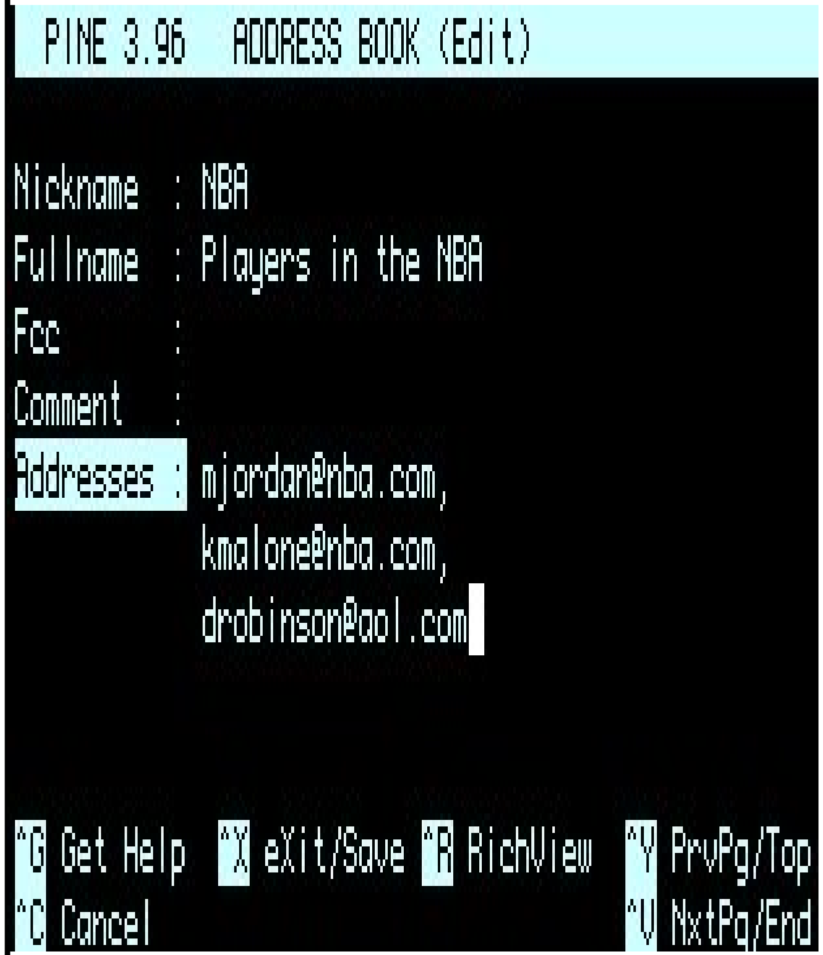
Form fill in

- interaction style also called fill in the blanks
- aimed at different set of users viz CLI, non-experts users.
- Original Form Fill In Design whole interface was form-based,
- Unlike today's software that mix forms with other interaction styles.
- Yesteryears design , the screen was designed as a form-
- data could be entered in the pre-defined form fields.
- Old Railway Reservation Counters – Text Mode Displays – **How quickly the operators issued tickets!!!**

FORM FILL IN INTERFACES

- TAB key more famous with FORMs than for the intended 8 blank space on the screen!!!
- TAB-key was (and still is) used to switch between the fields and ENTER to submit the form.
- originally no need for a pointing device - mouse . Earlier users felt mouse like a device to be lifted and placed!!!
- separation of data in fields allowed for validation of the input.
- Form fillin interfaces were (and still is) especially useful for routine, clerical work or for tasks - extensive data entry operation

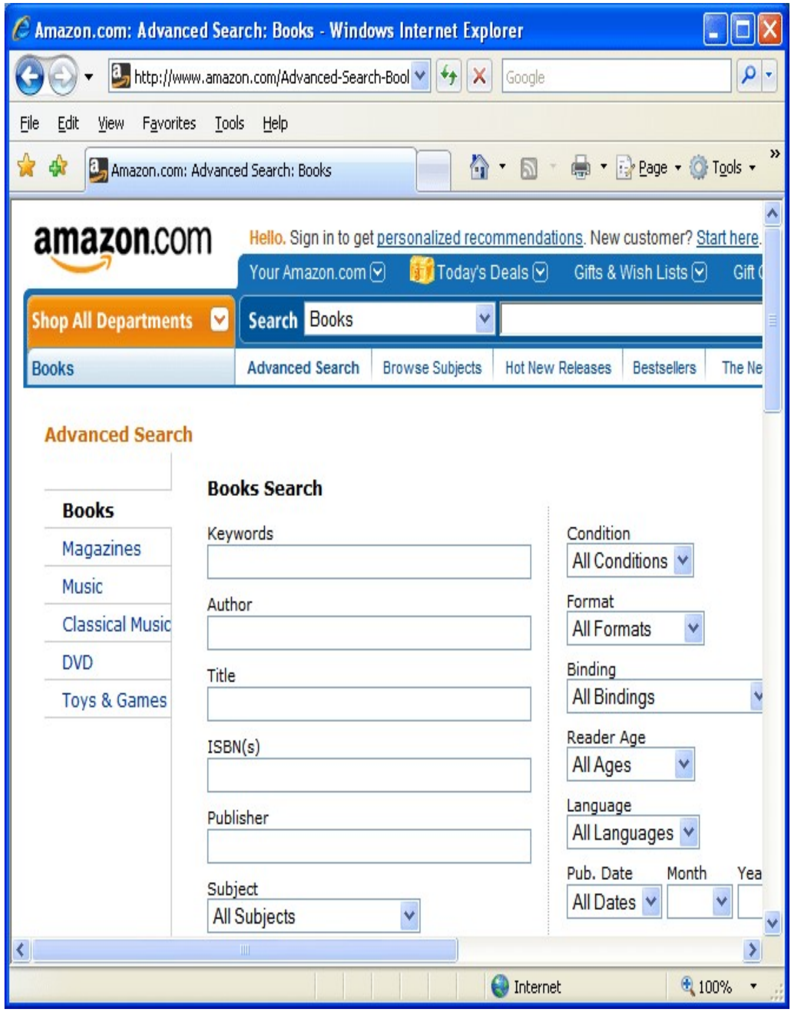
Examples of FORM FILL IN INTERFACES



```
  PINE 3.96   ADDRESS BOOK (Edit)

Nickname  : NBA
Fullname  : Players in the NBA
Fcc       :
Comment   :
Addresses : mjordan@nba.com,
            kmalone@nba.com,
            drobinson@aol.com

^G Get Help  ^X eXit/Save  ^R RichView  ^Y PrvPg/Top
^C Cancel                               ^V NxtPg/End
```



Amazon.com: Advanced Search: Books - Windows Internet Explorer
http://www.amazon.com/Advanced-Search-Bool
Google
File Edit View Favorites Tools Help
Amazon.com: Advanced Search: Books
Page Tools
amazon.com
Hello. Sign in to get personalized recommendations. New customer? Start here.
Your Amazon.com
Today's Deals
Gifts & Wish Lists
Gift
Shop All Departments
Search
Books
Advanced Search
Browse Subjects
Hot New Releases
Bestsellers
The Ne
Magazines
Music
Classical Music
DVD
Toys & Games
Internet
100%

Advanced Search

Books Search

Keywords

Author

Title

ISBN(s)

Publisher

Subject: All Subjects

Condition: All Conditions

Format: All Formats

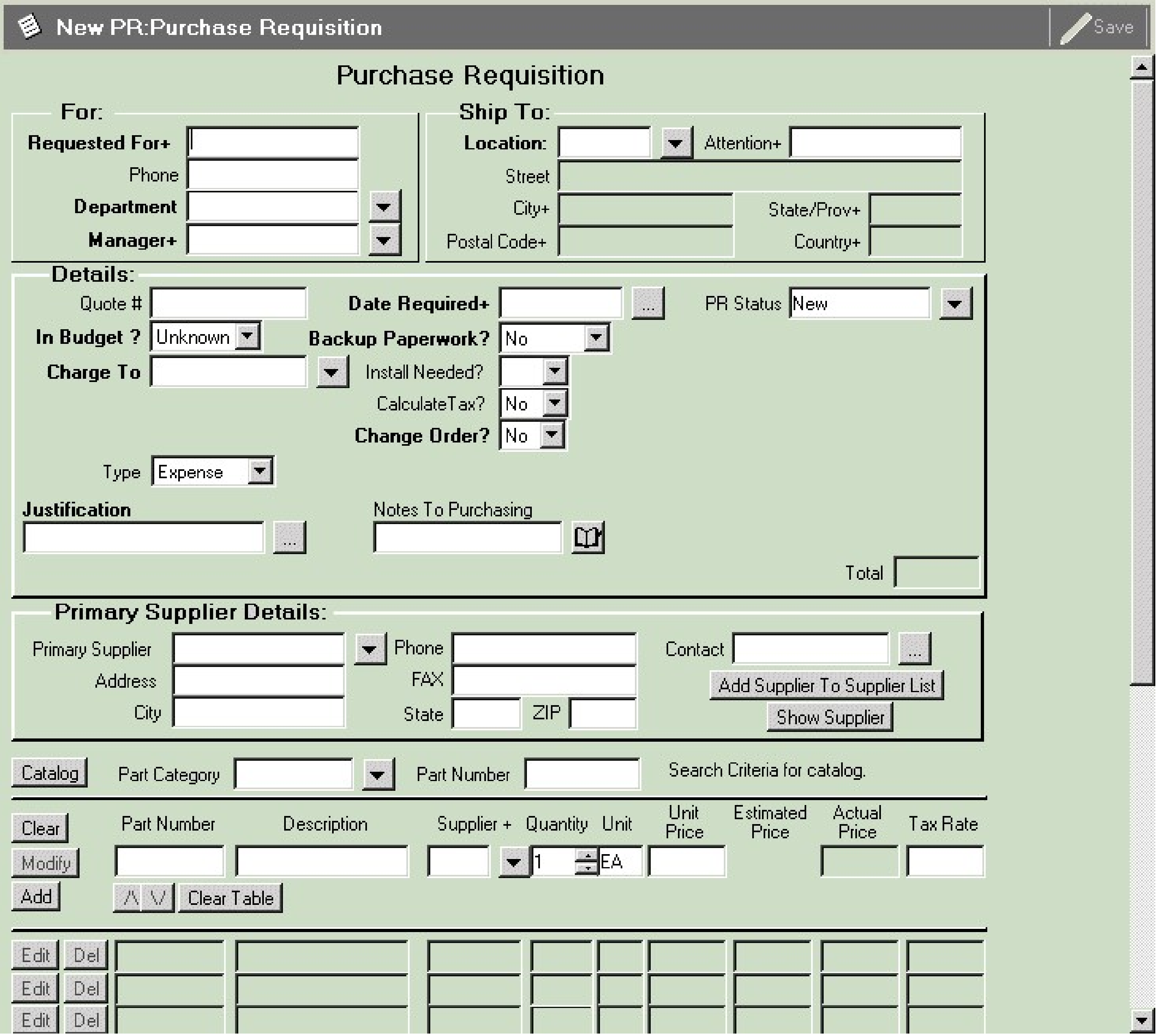
Binding: All Bindings

Reader Age: All Ages

Language: All Languages

Pub. Date: All Dates Month Yea

Examples of FORM FILL IN INTERFACES



New PR:Purchase Requisition

Purchase Requisition

For:

Requested For+

Phone

Department

Manager+

Ship To:

Location:

Attention+

Street

City+

State/Prov+

Postal Code+

Country+

Details:

Quote #

Date Required+

PR Status: New

In Budget ? Unknown

Backup Paperwork? No

Charge To

Install Needed?

CalculateTax? No

Change Order? No

Type: Expense

Justification

Notes To Purchasing

Total

Primary Supplier Details:

Primary Supplier

Phone

Contact

Address

FAX

City

State

ZIP

Part Category

Part Number

Search Criteria for catalog.

Part Number	Description	Supplier +	Quantity	Unit	Unit Price	Estimated Price	Actual Price	Tax Rate
			1	EA				

- video rental software, financial systems, pay roll systems etc. still purely forms-based.
- Advantages
- Simplifies data entry.
- Shortens learning --fields are predefined and to be only 'recognised'. Not recalled!!!
- *Guides* the user via the predefined rules
- Easy to program
- Easy for user to see the options available
- Data validation can be used on data entry forms
- Fast to enter data / make choices . Little or no training required huge amounts of processing power or memory

- **Disadvantages**
- Consumes screen space.
- Set scene for rigid formalisation of the business processes.
- "form fillin" is not an abbreviation of "form filling". read "form fill-*in*".
- Only limited options presented
- Visually impaired people might have trouble seeing the text or options
- Not good for highly complex applications, for example, a tax form might have 20 pages of options that need to be completed

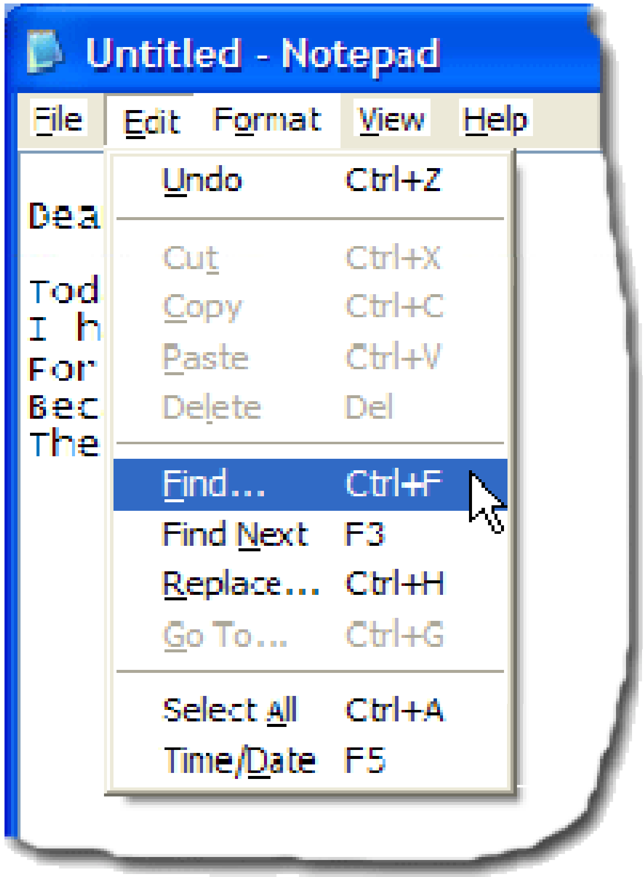
- **Menu selection**
- A menu – set of options displayed on the screen where the selection and execution of one (or more) of the options results in a state change of the interface
- In a menu based interface , user selects a command from a predefined selection of commands arranged in menus and observes the effect.
- used in applications with a familiar, limited, and uniform set of functions.
- labels on menus/commands understandable / grouped well

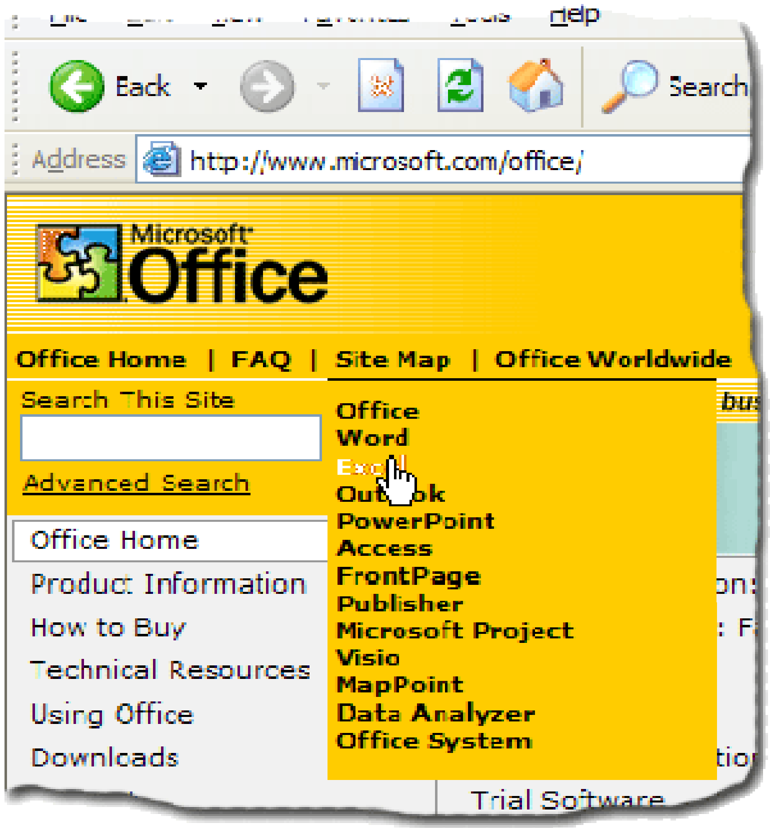
  users accomplish tasks with negligible learning /memorisation

  - finding command/menu item - recognition vs recall memory

- **Menu selection**

- save screen space menu items - clustered in pull-down or pop-up menus. Examples are listed





- **Advantages**
- Ideal for **novice or intermittent users**.
- Can appeal to expert users if display and selection mechanisms are rapid ; if appropriate "shortcuts" are implemented.
- Affords exploration - users can "look around" in the menus for the appropriate command
- Rather than remembering name of a command *and* its spelling when using command language.
- Structures decision making.
- **Allows easy support of error handling** as the user's input does not have to be parsed viz command language

- Handy for computer beginners and novice users
- Low cognitive load on users
- Familiar interface across different platforms
- creating an order / hierarchy for user pathways
- More control over user interactions
- Simple to implement in various kinds of devices
- **very intuitive interface** because of its limitations
- menu -Settings, Parameters, Tools, Customization **not helpful to users.** No indication of what a heading does / why you need four separate ones -- seems like the same action.

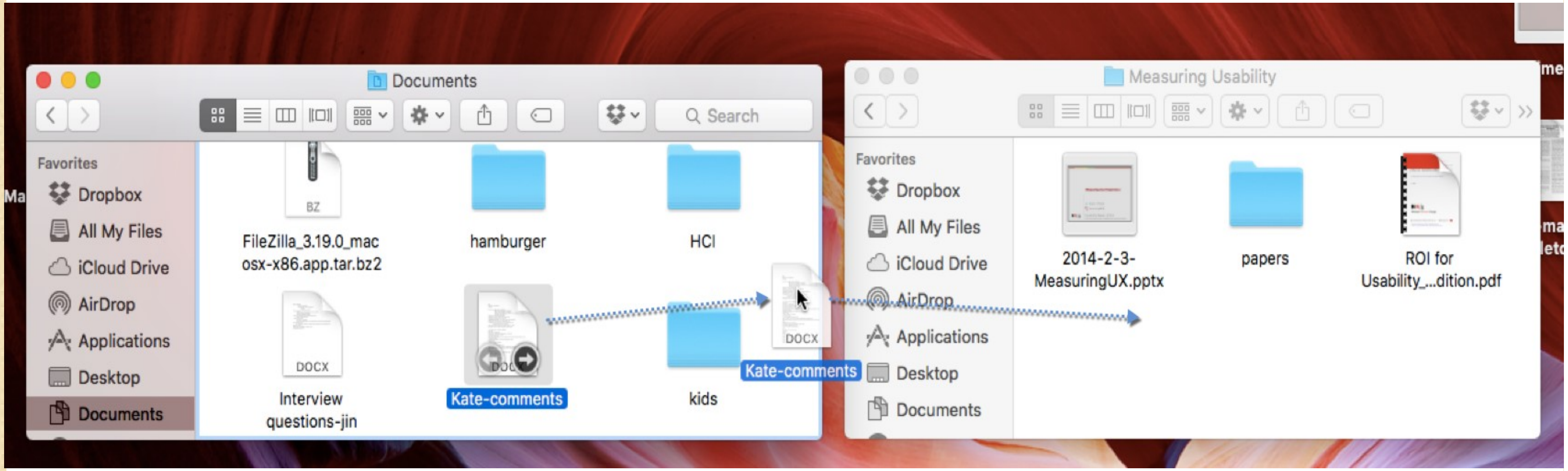
- **Disadvantages**

- Limited menu options
- Sub-menus might - difficult to find / access
- Risks of taking up a lot of screen space or being too small
- Requires unnecessary actions for a simple task
- Too many menus may lead to information overload or complexity of discouraging proportions.
- May be slow for frequent users.
- **May not be suited for small graphic displays.**

- **Direct manipulation**
- Direct manipulation - central theme in interface design
- Introduced by Ben Shneiderman - NYU Symposium on User Interfaces (Shneiderman 1982)
- Shneiderman - a certain ‘direct’ software interaction style - traced back to Sutherlands sketchpad (Sutherland 1963).
- Direct manipulation --idea of “direct manipulation of the object of interest” - which means
- objects of interest represented as distinguishable objects in the UI
- manipulated in a direct fashion.

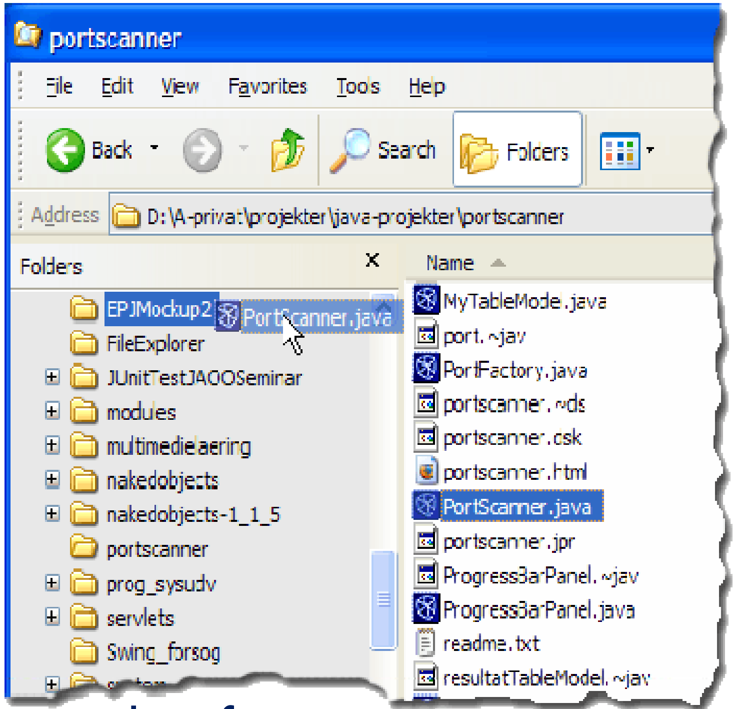
- Direct manipulation - interaction style in which the objects of interest in the UI are visible and can be acted upon via physical, reversible, incremental actions that receive immediate feedback.
- **Following Characteristics**
- Visibility of the object of interest.
- Rapid, reversible, incremental actions.
- Replacement of complex command language syntax by direct manipulation of the object of interest.
- Action of using your fingertips to zoom in and out of the image is an example of a direct-manipulation interaction. Another classic example is dragging a file from a folder to another one in order to move it.

On a mobile phone you can pinch out to zoom into an image and pinch in to zoom out.



file on MacOS using direct manipulation involves dragging that file from the source folder and moving it into the destination folder.

- **Advantages**
- Visually presents task concepts.
- Easy to learn.
- Errors can be avoided more easily.
- Encourages exploration.
- High subjective satisfaction.



- Recognition memory (as opposed to cued or free recall memory)
- sometimes equated with "what you see is what you get" (WYSIWYG).
- combine menu-based interaction with physical actions such as dragging and dropping in order to help the user use the interface with minimal learning.

- Continuous representation of the object of interest
- Physical actions instead of complex syntax.
- Continuous feedback and reversible, incremental actions.

- **Disadvantages:**
- May be more difficult to programme.
- Not suitable for small graphic displays.
- Spatial and visual representation - not always preferable.
- Metaphors misleading - essence of metaphor is understanding and experiencing one kind of thing in terms of another

  (makes a metaphor different from what it represents or points to.
- Compact notations may better suit expert users.

Continuous representation of the objects? you can only act on the small number of objects that can be seen at any given time.

Physical actions? RSI (repetitive strain injury). lot of work to move all those icons and sliders around the screen.

Continuous feedback? Only if you attempt an operation that the system feels like letting you do. something that's not available, you can push and drag buttons and icons as much as you want with no effect whatsoever. No feedback, only frustration.

Rapid learning? Yes, if the design is good, but in practice learnability depends on how well designed the interface is.

menus with poorly chosen labels, buttons - dont look clickable, or drop-down boxes with more options than length of the screen.

Form fillin

+simplifies data entry
+requires modest training
+gives convenient assistance
+permits form-management tools

-consumes screen space
-may require more computer skills

Command language

+is flexible
+appeals to power/expert users
+supports user initiative
+allows user-defined macros

-has poor error handling
-substantial training and memorization

Natural language

+relieves burden of learning syntax
+spoken NL allows busy hands

-requires clarification dialog
-may require more keystrokes
-may not show context
-is unpredictable due to ambiguity
-spoken harmed by noise

Advantages	*Disadvantages*
Direct manipulation	
+visually presents task concepts	-maybe hard to program
+reduces syntax	-requires graphical displays and pointing/selecting devices
+allows easy learning	
+allows easy retention	
+allows errors to be avoided	
+encourages exploration	
+affords high subjective satisfaction	
Menu selection	
+shortens learning	-presents danger of many menus
+reduces keystrokes	-may slow frequent/expert users
+structures decision making	-consumes screen space
+use of dialog-management tools	-requires rapid display rate
+easy support of error handling	
+can guide through task	