HUMAN COMPUTER INTERFACE

PRESENTED BY:-

Mrityunjay Kumar

(Roll-30)

GUIDED BY:-

Prof. Swati Jamdar

What is an Interface

- An interface is a device or a system that unrelated entities use to interact.

  Example-

- The buttons on the front of our television set are the interface between me and the electrical wiring on the other side of its plastic casing. If I press the "power" button to turn the television on and off.

Continued……

- A remote control is an interface between me and a television set.
- The English language is an interface between two people.
- The protocol of behavior enforced in the military is the interface between people of different ranks.

Human-Human Interface

- How do we interact with each other?
  - First Impression
    - Appearance, Dress, Voice, Posture
  - Assumptions
    - What we've heard
    - What we guess
  - Initial Conversations
  - Developed Relationship

Human Computer Interface

- A term used to describe the interaction between the user and a computer. The method by which the user tells the computer what to do and the responses which the computer makes.
- Understand the need to facilitate an effective dialogue between humans and machines.

Continued……..

- Explain the need to design systems which are appropriate to users at all levels and in different environments.
- A point where two objects meet.
- A point where the human can tell the computer what to do.
- A point where the computer displays the requested information.

Similarity b/w Human and Computer

- A human usually has 5 senses:
  - Sight
  - Hearing
  - Touch
  - Taste
  - Smell
- A computer hasn’t any senses as such, it is machinery, with electrons running around in and out of component devices.

Tools Used for Interface?

- A keyboard for typing.
- A mouse for clicking.
- A scanner for copying.
- A camera for images.
- A monitor for displaying.
- A printer for printing.
- A sound card for audio.
- A DVD for video.

Types of Interface

- *Command Line Interface (CLI)*
- *Menu Driven Interface(MDI)*
- *Graphical User Interface (GUI)*
- *Natural Language Interface*

Command Line Interface

- A CLI displays a prompt, the user types a command on the keyboard and executes the command. The computer executes the command providing textual output.
- systems like MS-DOS that require a degree of technical ability and are not user friendly.


Command Prompt
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\ARYAN>

Advantages of CLI

- Very flexible with the use of “switches” (options)
- Good for expert.
- Quickly accessible.
- Uses the fewest system resources
- Take up less Memory

Disadvantages of CLI

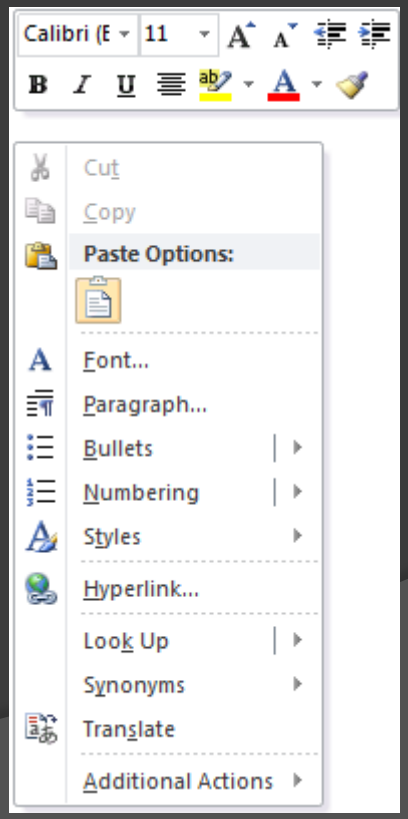
- “Hidden” features i.e. if you don’t know the commands you wont know the features are there!
- Not good for new users.
- Difficult.
- Need experience.
- Syntax difficult to remember.
- Typing mistakes!
- Complex.

Menu Driven Interface

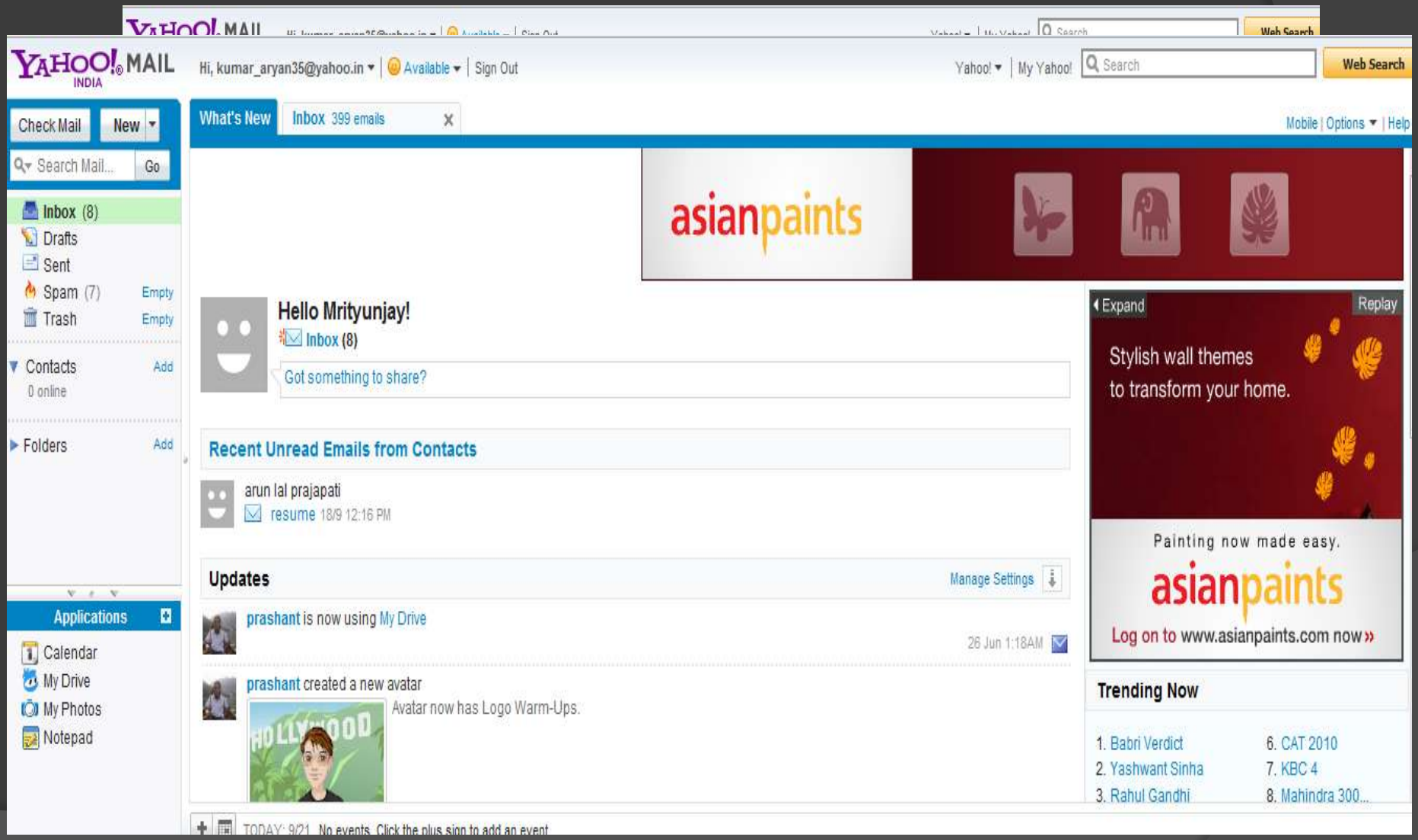
- The user has a list of items to choose from, and can make selections by highlighting one.

Menus(Pop Up)

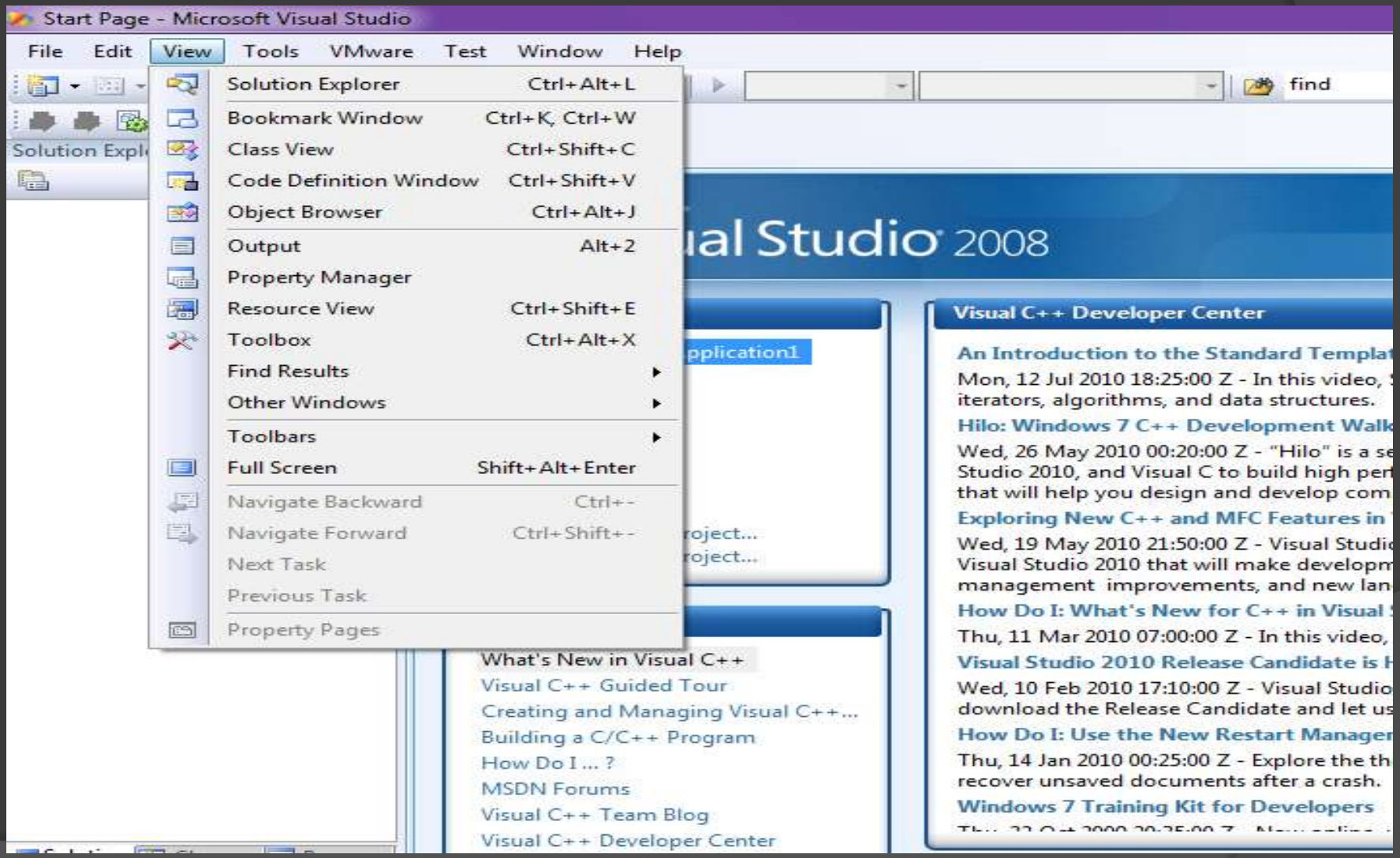
[mouse right click]



Menus (Whole Screen)



Menus (Pull Down)



Menus (Pop Up)


VLC media player
TextPad
Notepad
Microsoft PowerPoint 2010
Microsoft Word 2010
VMware Workstation
Download Accelerator Plus (DAP)
Virtual DJ
PowerISO
Borland C++
All Programs
Search programs and files
ARYAN
Documents
Pictures
Music
Games
Computer
Control Panel
Devices and Printers
Default Programs
Help and Support
Shut down

Menu Driven Applications

- ATM
- Mobile Phone
- MP3 Player
- Video recorder
- Household Devices
- Digital/Cable TV
- Computer Programmes

Advantages of MDI

- No need to learn complex commands/language.
- Easier for a novice to learn/use.
- Ideal when there are a limited number of options (efficient).

Disadvantages of MDI

- Can be frustrating for experienced users i.e. the command they want to use is buried 5 levels deep.
- User interface may be limited by screen space and number of options available.

Graphical User Interface

- Used on computers first by Apple Macintosh, and afterwards by Microsoft.
- The memory and file management are done by the operating system while applications are running – Multi-Tasking.
- A mouse is used to point and click on icons instead of typing in a command.

Continued……..

- Uses windows, icons, menus and pointers (WIMP) which can be manipulated by a mouse (and often to an extent by a keyboard as well).
- Make computing easier by separating the logical threads of computing from the presentation of those threads to the user, through visual content on the display device.

Icons


Computer
Borland C++
RegistryBo... 2010
101MSDCF1
TC - Shortcut
VMware Workstation
Recycle Bin
TextPad
Prog
Adobe Reader 9
PowerISO
Idea Net Setter
NetBeans IDE 6.9
j2se6
Sql Server 2000 Datab...
VLC media player
101MSDCF
One Two Three
Virtual DJ
microsoft
chidori
code name
8
Windows
Years after floods, re...
MSNBC N... Wed Sep 15
Half of docs in traini...
MSNBC N... Wed Sep 15
Lawsuit on Obama h...
MSNBC N... Wed Sep 15
Shaken not stirred: B...
MSNBC N... Wed Sep 15
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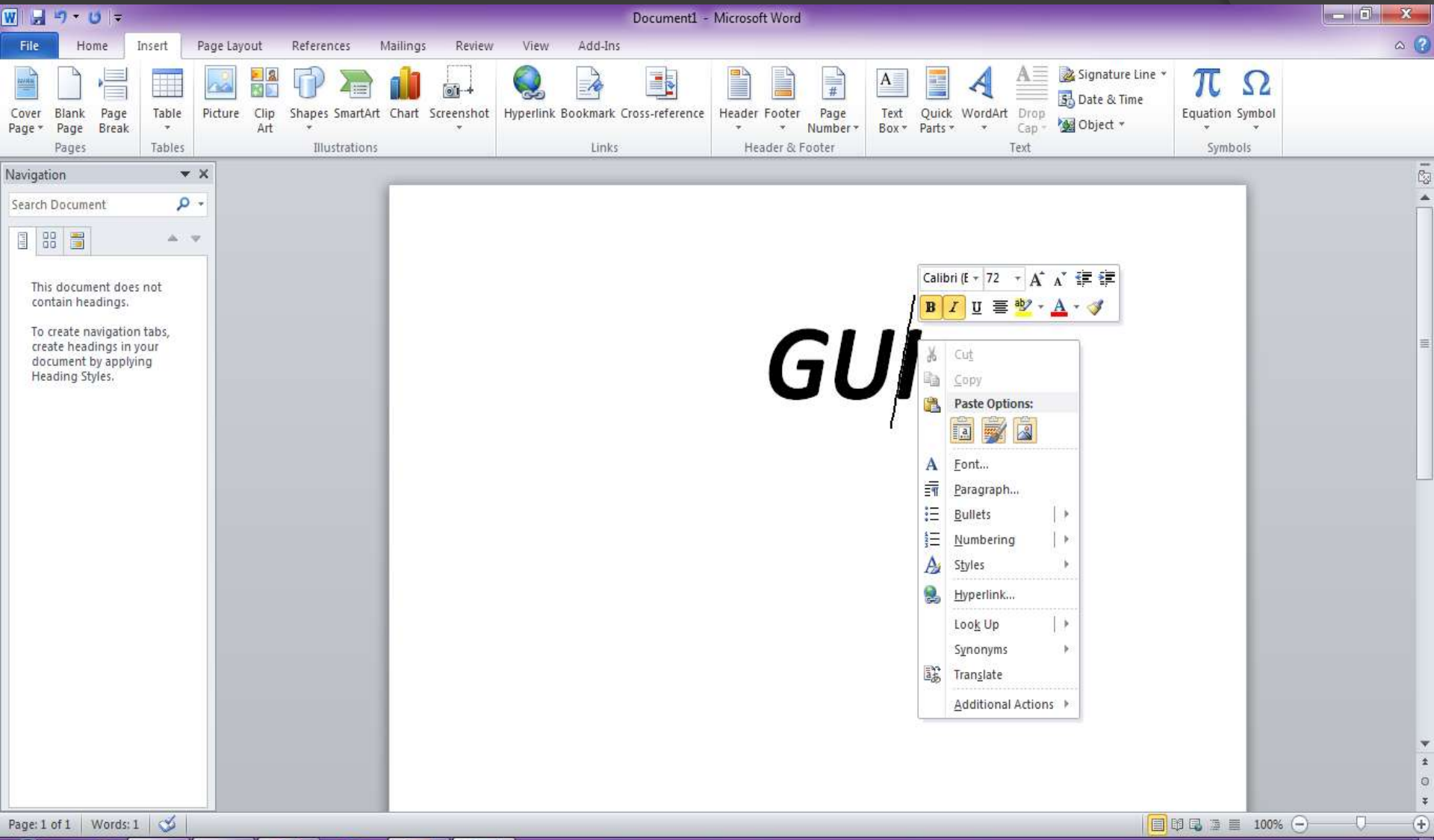
9/20/2010


Document1 - Microsoft Word
File
Home
Insert
Page Layout
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Mailings
Review
View
Add-Ins
Cover Page
Blank Page
Page Break
Pages
Table
Tables
Picture
Clip Art
Shapes
SmartArt
Chart
Screenshot
Illustrations
Hyperlink
Bookmark
Cross-reference
Links
Header
Footer
Page Number
Header & Footer
Text Box
Quick Parts
WordArt
Drop Cap
Signature Line
Date & Time
Object
Text
Equation
Symbol
Symbols
Navigation
Search Document
This document does not contain headings.
To create navigation tabs, create headings in your document by applying Heading Styles.
GUI
Calibri (E
72
Cut
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Font...
Paragraph...
Bullets
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Hyperlink...
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9/20/2010

Main Features of-

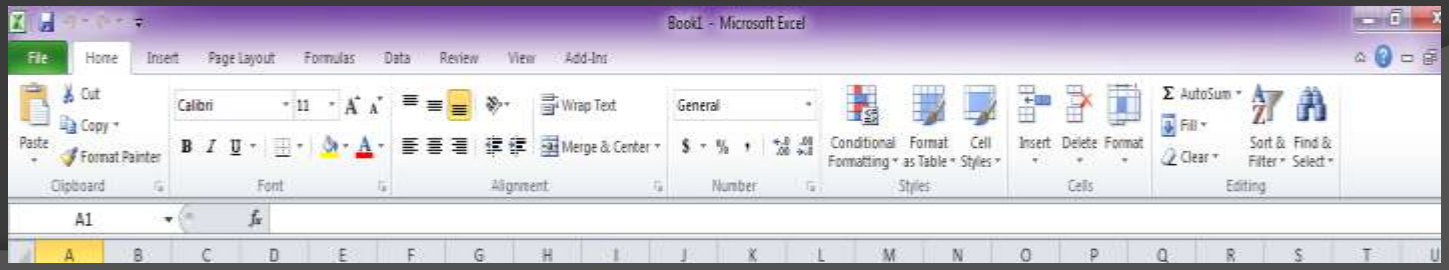
- Mouse: main input device, it moves the cursor across the screen. Left click for selection. Right click for a shortcut drop-down menu.
- Windows: many can be opened at the same time allowing for simple transfer of data between them.
- Toolbar Menus: that drop-down when clicked.
- Pointers: a pen may be used to point and draw

Standardisation

- The GUI is very similar in different applications.
- In an integrated package it will be almost identical from application to application.

Word

Power Point



Excel

Advantages of GUI

- User friendly because don‘t have to remember all commands.
- Intuitive - easy to learn with minimum training.
- Suitable for users with lower IT skills.
- A number of different applications will use the same icons and methods - so each one ‘feels' the same.
- Increased speed of learning.

Disadvantages of GUI

- It takes more RAM and storage space on the disc.

Natural Language Interface

- VUI uses speech technology to provide people with access to information and to allow them to perform task.
- Can range from simple command systems to voice activated text processing. Commands are spoken in “normal” language.
- Auditory interfaces interact with the user purely through sound. Speech is input by the user and speech or nonverbal audio is output by the system.

Advantages of NLI

- No training required – we just tell the computer what we want to do.
- Can be quicker than keyboard entry.
- Hands-free.
- Can be used by the normal person

Disadvantages of NLI

- Emerging technology.
- Difficulty dealing with homonyms.
- Difficult to recognise all the different ways of saying things .
- Artificial languages are often more precise.

Feedback

- Reduced customer support and service costs.
- Reduced customer training costs.
- Increased user productivity.
- Avoidance of costly delays in the product development schedule in order to fix major usability problems before going to market.

Conclusion

- HCI is a key characteristic software quality.
- There is no “magic pill” but using systematic techniques can reduce the risk of major design flaws that result in user acceptance problems and costly rework.

Thanks

Computer Match

- A good interface match would include as many senses as possible.
- Computer input and output is basically seeing what we enter and what is displayed.
- Sound can be added to some programs, either by giving instructions by voice, or listening to a commentary / music.
- Touch can be in the form of using the mouse, a joystick, or a drawing tablet.

Virtual Reality

- Virtual Reality is a computer interface.
- The applications programs combine the interfaces already mentioned to give a simulated three dimensional world of sight, sound, touch and movement.
- Interaction may be made through special equipment such as: spectacles, gloves, sound systems, and the computer and monitor.
- As these types of interfaces develop and become more advanced (realistic) through high level programming, so the human use will become more common and so it will seem to be similar to communication with other humans.

Common Features

- Users get used to an operating system.
- Commands are similar, keys and click perform the same tasks.
- Learning is achieved faster throughout different applications.
- Consistency in screen layout; menus, dialogue boxes, and error messages.
- Customisation is similar in applications.
- On-line help is offered in a similar way.
- In business users are much more efficient in their work if using common facilities.

Control

- The GUI controls the hardware, i.e. the use of memory, storage, printers.
- It can influence how the user interacts with the program they are working on.
- Being able to Open, Save, Print, and use Help in a word processor means the user can do it in a spreadsheet, a database etc without any further training.
- This makes it much easier to transfer skills from one application to another.

Disabled Users

- There are many featured designed for disabled users.
- A visually impaired person may be unable to use the GUI features, and find that typing in commands are easier. The printed output may be produced on Braille.
- A hearing impaired person may be able to use speech commands and listen to the output through speakers. This may also be a preferred method for users with other disabilities who cannot use a keyboard and mouse.

Forms

- A type of user interface (dialogue box), for entering or viewing data.
- Features: text boxes, labels, and buttons.

Natural Language

- Normal speech recognised by a computer is Natural Language Interface. Talk to a computer and it recognises what we want.
- Natural means human-like, and the technology is leaning towards getting computers to behave in a more natural way.

Pointer Based

- Using a pen like stylus on a special pad or tablet.
- Used in freehand graphics, and CAD using special software that recognises the shape and style of the lines.
- Could also be a touch sensitive screen.
- All are easy to use and more natural than using a mouse.

Other Interface Devices

Mouse.

Keyboard.

Touch sensitive pad.

Speech recognition.