



INTRODUCTION TO MULTIMEDIA

Chapter 8 Interface Design

Introduction

- ◆ In computer science and human-computer interaction, the user interface (of a computer program) refers to the graphical, textual and auditory information the program presents to the user, and the control sequences (such as keystrokes with the computer keyboard, movements of the computer mouse, and selections with the touchscreen) the user employs to control the program.

User Interface Design

- ◆ **User interface design** or **user interface engineering** is the design of computers, appliances, machines, mobile communication devices, software applications, and websites with the focus on the user's experience and interaction.
- ◆ The goal of user interface design is to make the user's interaction as intuitive as possible.
- ◆ The intuitiveness of an interface may depend on symbology from an artistic perspective as much as functionality from a technical engineering perspective.



Processes

1. **Functionality requirements gathering** - assembling a list of the functionality required of the system to accomplish the goals of the project and the potential needs of the users.

Processes

2. **User analysis** - analysis of the potential users of the system either through discussion with people who work with the users and/or the potential users themselves. Typical questions involve:
 - What would the user want the system to do?
 - How would the system fit in with the user's normal workflow or daily activities?
 - How technically savvy is the user and what similar systems does the user already use?
 - What interface look & feel styles appeal to the user?



Processes

3. **Information architecture** - development of the process and/or information flow of the system



Processes

4. **Prototyping** - development of wireframes, either in the form of paper prototypes or simple interactive screens. These prototypes are stripped of all look & feel elements and most content in order to concentrate on the interface.



Processes

5. **Usability testing** - testing of the prototypes on an actual user—often using a technique called talk aloud protocol where you ask the user to talk about their thoughts during the experience.

Processes

6. **Graphic Interface design** - actual look & feel design of the final graphical user interface (GUI.) It may be based on the findings developed during the usability testing if usability is unpredictable, or based on communication objectives and styles that would appeal to the user.

Types of User Interface

Command-line interfaces

- ◆ Where the user provides the input by typing a command string with the computer keyboard and the system provide output by printing text on the computer monitor.
- ◆ Used for system administration tasks etc.

```
C:\>dir
Volume in drive C is Windows
Volume Serial Number is B4F7-C128

Directory of C:\

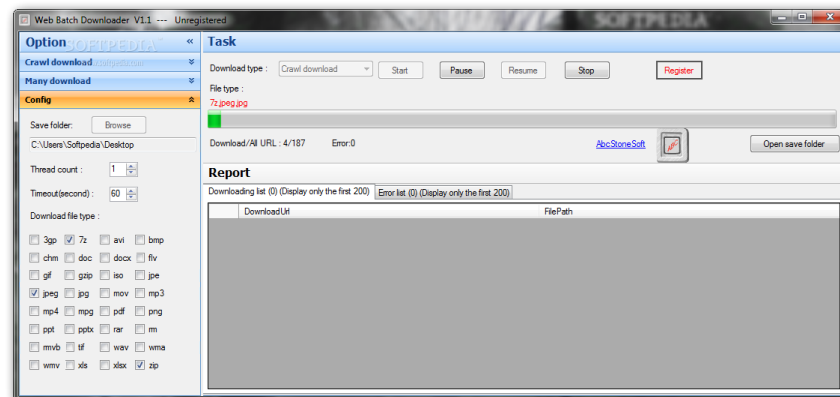
01/10/2007  19:38    <DIR>          25c7843ff7527e04ca3749
19/09/2007  16:56    <DIR>          97a61370812ce95093c63d
19/09/2007  16:42                0 AUTOEXEC.BAT
19/09/2007  16:36                211 boot.ini.comodofirewa
19/09/2007  16:42                0 CONFIG.SYS
19/09/2007  16:48    <DIR>          Documents and Settings
19/09/2007  16:53    <DIR>          e4a32567d68c0d02f07b4d
19/09/2007  16:54    <DIR>          Intel
01/03/2008  21:48    <DIR>          Program Files
19/09/2007  16:57                516 RHDSetup.log
25/11/2007  13:03    <DIR>          UBCD4Win
13/03/2008  11:32    <DIR>          WINDOWS
                     4 File(s)          727 bytes
                     8 Dir(s)  1,479,077,888 bytes free

C:\>
```

Types of User Interface

Batch interfaces

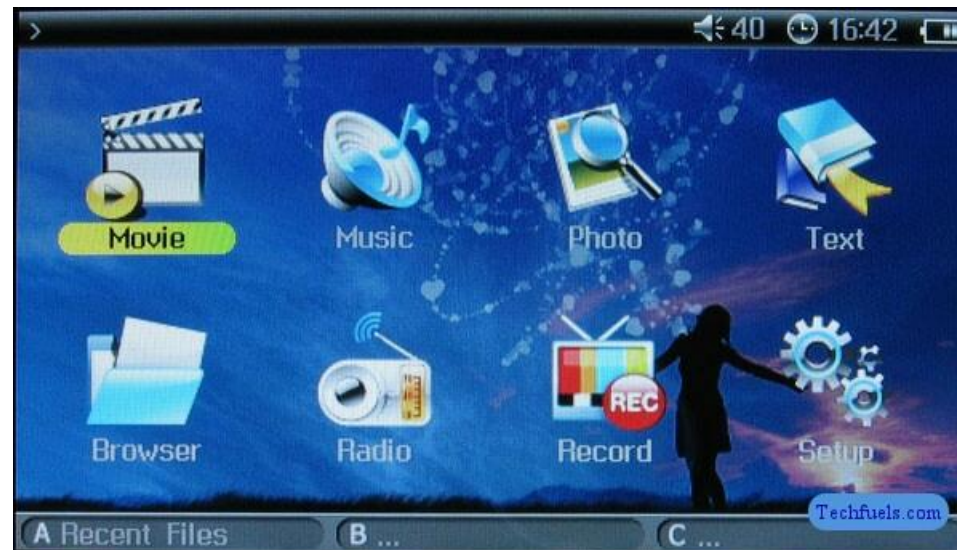
- ◆ Non-interactive user interfaces, where the user specifies all the details of the batch job in advance to batch processing, and receives the output when all the processing is done.
- ◆ The computer does not prompt for further input after the processing has started.



Types of User Interface

Graphical user interfaces (GUI)

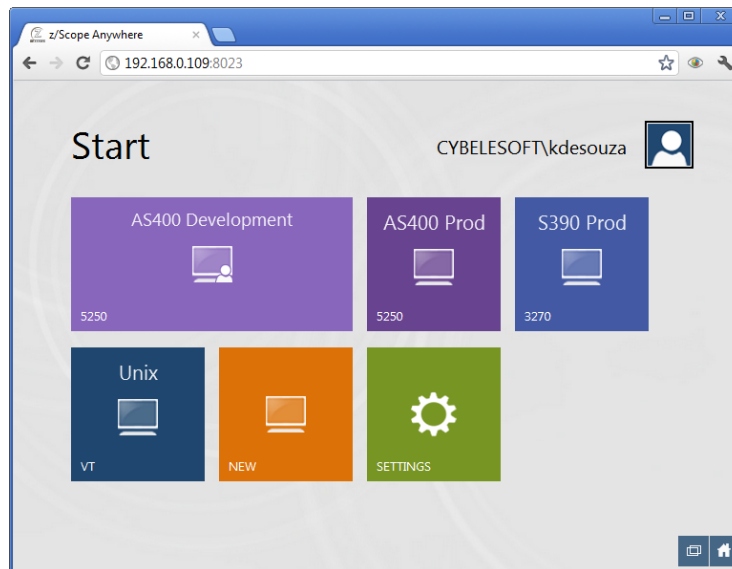
- ◆ Accept input via devices such as computer keyboard and mouse and provide articulated [graphical] output on the [computer monitor].



Types of User Interface

Web-based user interfaces,

- ◆ Accept input and provide output by generating web pages which are transported via the Internet and viewed by the user using a web browser program.



Interaction Styles

◆ **Command line interface**

- A Command Line Interface or CLI is a method of interacting with an operating system or software using a command line interpreter. This command line interpreter may be a text terminal, terminal emulator, or remote shell client.

◆ **Graphical user interface (GUI)**

- Copy and paste, Cut and paste
- Single Document Interface, Multiple Document Interface, Tabbed Document Interface

◆ **WIMP**

- WIMP stands for "window, icon, menu, pointing device", denoting a style of interaction using these elements.

Interaction Styles

◆ **Point-and-click**

- Point-and-click is the action of a computer user moving a cursor to a certain location on a screen (point) and then clicking a mouse button, usually the left one (click), or other pointing device.

◆ **Drag-and-drop**

- drag-and-drop is the action of (or support for the action of) clicking on a virtual object and dragging it to a different location or onto another virtual object.

◆ **Cursor**

- a cursor is an indicator used to show the position on a computer monitor or other display device that will respond to input.

Interaction Styles

◆ **Widget**

- a widget (or control) is an interface element that a computer user interacts with, such as a window or a text box.

◆ **Direct manipulation interface**

- Direct manipulation is a human-computer interaction style which involves continuous representation of objects of interest, and rapid, reversible, incremental actions and feedback

◆ **Desktop metaphor**

- The desktop metaphor is a set of unifying concepts currently used in a number of graphical user interfaces in computer operating systems. The monitor of a computer represents the user's desktop upon which documents and folders of documents can be placed.

Interaction Styles

◆ **Window managers**

- A window manager is computer software that controls the placement and appearance of windows within a windowing system in a graphical user interface.

◆ **WYSIWYG**

- WYSIWYG is an acronym for **What You See Is What You Get**, used in computing to describe a system in which content during editing appears very similar to the final product.

Interaction Styles

◆ **Zooming User Interface (ZUI)**

- A Zooming User Interface or Zoomable User Interface (ZUI, pronounced Zoo-ee) is a graphical environment where users can change the scale of the viewed area in to see more detail or less.

◆ **Crossing Based Interfaces**

- Crossing-based interfaces are graphical user interfaces that use crossing gestures instead of - or in complement to pointing.

Graphical User Interface

- ◆ A **graphical user interface (GUI)** is a type of user interface which allows people to interact with a computer and computer-controlled devices which employ graphical icons, visual indicators or special graphical elements called "widgets", along with text, labels or text navigation to represent the information and actions available to a user.
- ◆ Its goal is to enhance the usability of the underlying logical design of a stored program.

Graphical User Interface

GUI Advantages

- ◆ They are easy to learn and use.
 - Users without experience can learn to use the system quickly.
- ◆ The user may switch quickly from one task to another and can interact with several different applications.
 - Information remains visible in its own window when attention is switched.
- ◆ Fast, full-screen interaction is possible with immediate access to anywhere on the screen

Graphical User Interface

GUI Disadvantages

- ◆ Variety of I/O choices can be confusing for developers and users
- ◆ Various pop-up menus and windows can quickly become confusing
- ◆ Choice of colors, textures, sounds, images requires graphic arts background

Elements of Graphical User Interface

Pointer

- ◆ A graphical image on a screen that indicates the location of a pointing device, and can be used to select and move objects or commands on the screen.
- ◆ A pointer commonly appears as an angled arrow, but it can vary within different programs or operating systems.



Elements of Graphical User Interface

Window

- ◆ A window is an area on the screen that displays information, with its contents being displayed independently from the rest of the screen.
- ◆ It is easy for a user to manipulate a window: it can be opened and closed by clicking on an icon or application, and it can be moved to any area by dragging it (that is, by clicking in a certain area of the window).

Elements of Graphical User Interface

Menus

- ◆ Menus allow the user to execute commands by selecting from a list of choices.
- ◆ Options are selected with a mouse or other pointing device within a GUI.
- ◆ Menus are convenient because they show what commands are available within the software.



Elements of Graphical User Interface

Icons

- ◆ An icon is a graphical image, small picture or object that represents a file, program, web page, or command.
- ◆ They are a quick way to execute commands, open documents, and run programs.



Elements of Graphical User Interface

Tabs

- ◆ A tab is typically a rectangular small box which usually contains a text label or graphical icon associated with a view pane.
- ◆ When activated the view pane, or window, displays widgets associated with that tab; groups of tabs allow the user to switch quickly between different widgets.
- ◆ Tabs are usually placed in groups at the top of a window.