Quadrant II – Transcript and Related Materials

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Interaction Styles

Interaction can be seen as a dialog between the computer and the user. The choice of interface style can have a profound effect on the nature of this dialog. There are a number of common interface styles including:

1. Command line interface
2. Menus
3. Natural language
4. Question/answer and query dialog
5. Form-fills and spreadsheets
6. WIMP
7. Point and click
8. Three-dimensional interfaces

Command line interface

The command line interface was the first interactive dialog style to be commonly used and, in spite of the availability of menu-driven interfaces, it is still widely used. It provides a means of expressing instructions to the computer directly, using function keys, single characters, abbreviations or whole-word commands. In some systems

the command line is the only way of communicating with the system, especially for remote access using telnet. Menu-based interfaces, providing accelerated access to the system's functionality for experienced users. Command line interfaces are powerful in that they offer direct access to system functionality and can be combined to apply a number of tools to the same data. They are also flexible: the command often has a number of options or parameters that will vary its behaviour in some way, and it can be applied to many objects at once, making it useful for repetitive tasks. Flexibility and power brings with it difficulty in use and learning.

Commands must be remembered, as no cue is provided in the command line to indicate which command is needed. They are therefore better for expert users than for novices. This problem can be alleviated a little by using consistent and meaningful commands and abbreviations. The commands used should be terms within the vocabulary of the user rather than the technician. Unfortunately, commands are often obscure and vary across systems, causing confusion to the user and increasing the overhead of learning.

Menus

A menu-driven interface makes set of options available to the user - displayed on the screen. Options are selected using the mouse, or numeric or alphabetic keys. Options visible are less demanding of the user - relying on recognition rather than recall. Menu options need to be meaningful and logically grouped to aid recognition. Menu presents a choice of operations or services that can be performed by the system at a given time. Our ability to recall information is inferior to our ability to recognize it from some visual cue. Menus provide information cues in the form of an ordered list of operations that can be scanned. The names used for the commands in the menu should be meaningful and informative. The pointing device is used to indicate the desired option. Item is usually highlighted when pointer moves to the position of a menu item. Selection requires some additional user action - such as pressing a button or pressing some special key. Menus are inefficient when they have too many items. As a solution to this, cascading menus are utilized. In cascading menus, item selection opens up another menu adjacent to the item allowing refinement of the selection. Several layers of cascading menus can be used to include varied choices.

Natural language

Users, unable to remember a command or lost in a hierarchy of menus, may long for the computer that is able to understand instructions expressed in everyday words. Natural language understanding, both of speech and written input, is the subject of much interest and research. The ambiguity of natural language makes it very difficult for a machine to understand. Language is ambiguous at a number of levels. First, the syntax, or structure, of a phrase may not be clear.

Question/answer and query dialog

Question and answer dialog is a simple mechanism for providing input to an application in a specific domain. The user is asked a series of questions (mainly with yes/no responses, multiple choice, or codes) and so is led through the interaction step by step These interfaces are easy to learn and use, but are limited in functionality and power. As such, they are appropriate for restricted domains (particularly information systems) and for novice or casual users.

Form-fills and spreadsheets

Form-filling interfaces are used primarily for data entry but can also be useful in data retrieval applications. The user is presented with a display resembling a paper form, with slots to fill in. Often the form display is based upon an actual form with which the user is familiar, which makes the interface easier to use. The user works through the form, filling in appropriate values. The data are then entered into the application in the correct place. Most form-filling interfaces allow easy movement around the form and allow some fields to be left blank. They also require correction facilities, as users may change their minds or make a mistake about the value that belongs in each field. The dialog style is useful primarily for data entry applications and, as it is easy to learn and use, for novice users.

Spreadsheets are a sophisticated variation of form filling. The spreadsheet comprises a grid of cells, each of which can contain a value or a formula. The formula can involve the values of other cells (for example, the total of all cells in this column). The user can enter and alter values and formulae in any order and the system will maintain

consistency amongst the values displayed, ensuring that all formulae are obeyed. The user can therefore manipulate values to see the effects of changing different parameters. Spreadsheets are an attractive medium for interaction: the user is free to manipulate values at will and the distinction between input and output is blurred, making the interface more flexible and natural.

WIMP

WIMP stands for windows, icons, menus and pointers. Default interface style for majority of interactive computer systems in use today. Examples of WIMP interfaces include Microsoft Windows and Mac OS.

Point and click

In multimedia systems and web browsers all actions take only a single click of the mouse button. Consider for example, you may point at a city on a map and when you click a window opens, showing you tourist information about the city. Point-and-click interface style closely related to the WIMP style use of buttons. The philosophy is simpler and more closely tied to ideas of hypertext. Point-and-click style is usually tied to mouse-based interfaces, but also extensively used in touch screen information systems combined with a menu-driven interface. The point-and-click style is popularized by World Wide Web pages. Web pages incorporate all types of point-and-click navigation like highlighted words, maps and iconic buttons

Three-dimensional interfaces

There is an increasing use of three-dimensional effects in user interfaces. The most obvious example is virtual reality, but VR is only part of a range of 3D techniques available to the interface designer. The simplest technique is where ordinary WIMP elements, buttons, scroll bars, etc., are given a 3D appearance using shading, giving the appearance of being sculpted out of stone. By unstated convention, such interfaces have a light source at their top right. Where used judiciously, the raised areas are easily identifiable and can be used to highlight active areas. Some interfaces make indiscriminate use of sculptural effects, on every text area, border and menu, so all sense of differentiation is lost.

Elements of the WIMP Interface

Together the elements of the WIMP interfaces are called widgets, and they comprise the toolkit for interaction between user and system.

The elements of WIMP interface are

- Windows
- Icons
- Menus
- Pointers

Windows

Windows are areas of the screen that behave as if they were independent terminals in their own right. A window contains text or graphics, can be moved or resized.

Icons

Windows can be closed and lost forever or they can be shrunk to some reduced representation. Icon is a small picture representation used to represent a closed window. Allowing icons enables availability of many windows on the screen at the same time, ready to be expanded to their full size by clicking on the icon. Iconifying the window means shrinking a window to its icon. When a user temporarily does not want to follow a particular thread of dialog - he can suspend that dialog by iconifying the window containing the dialog.

The icon saves space on the screen. Icon serves as a reminder to the user that he can subsequently resume the dialog by opening up the window. Icons can also be used to represent other aspects of the system such as a wastebasket. Icons can take many forms such as:

- Realistic representations of the objects that they stand for
- Highly stylized
- Arbitrary symbols - but using arbitrary symbols makes it difficult for users to interpret

Pointers

Interaction style required by WIMP relies on pointing and selecting things such as icons. Mouse, joysticks, trackballs provided as input devices are capable of pointing to these icons. User is presented with a cursor on the screen that is controlled by the input device. A variety of pointer cursor designs are also available.

Menus

Menu presents a choice of operations or services that can be performed by the system at a given time

Buttons

Buttons are individual and isolated regions within a display that can be selected by the user to invoke specific operations. Regions referred to as buttons because they resemble the push buttons on a control panel. ‘Pushing’ the button invokes a command the meaning of which is usually indicated by a textual label or a small icon. Buttons are also used to toggle between two states, displaying status information. Consider for example, the button informing whether the current font is italicized or not in a word processor. Buttons also used for selecting options on a web form. Various types of buttons such as Radio Buttons, Checkboxes, etc. are used for this purpose.

Toolbars

Toolbars are collection of icons placed at the top or side of the window offering commonly used functions. Function is similar to menu bar except that more functions can be simultaneously displayed. Content of the toolbar is often customizable. We can choose which functions are made available. We can choose which of the predefined toolbars is displayed

Palettes

Palette is a collection of icons that are reminiscent of the purpose of the various modes. An example in a drawing package would be a collection of icons to indicate the pixel color or pattern that is used to fill in objects,

much like an artist’s palette for paint. Some systems allow user to create palettes from menus or toolbars.

In the case of pull-down menus, the user may be able ‘tear off’ the menu, turning it into a palette showing the menu items. In the case of toolbars, he may be able to drag the toolbar away from its normal position and place it anywhere on the screen. Tear-off menus are usually those that are heavily graphical anyway, for example line-style or color selection in a drawing package.

Dialog boxes

Dialog boxes are information windows used by the system to bring the user’s attention to some important information. Information can be an error or a warning used to prevent a possible error. They are used to invoke a sub dialog between user and system for a very specific task that will normally be embedded within some larger task. Dialog boxes are used to factor out auxiliary task threads from the main task dialog. Consider for example, Save sub dialog box to save the file.