

A decorative graphic featuring various colored circles (teal, blue, green, yellow, orange, pink) and dashed lines of different colors (teal, green, yellow, orange) arranged in a circular pattern around the central text.

Chapter 8

User Interface Design



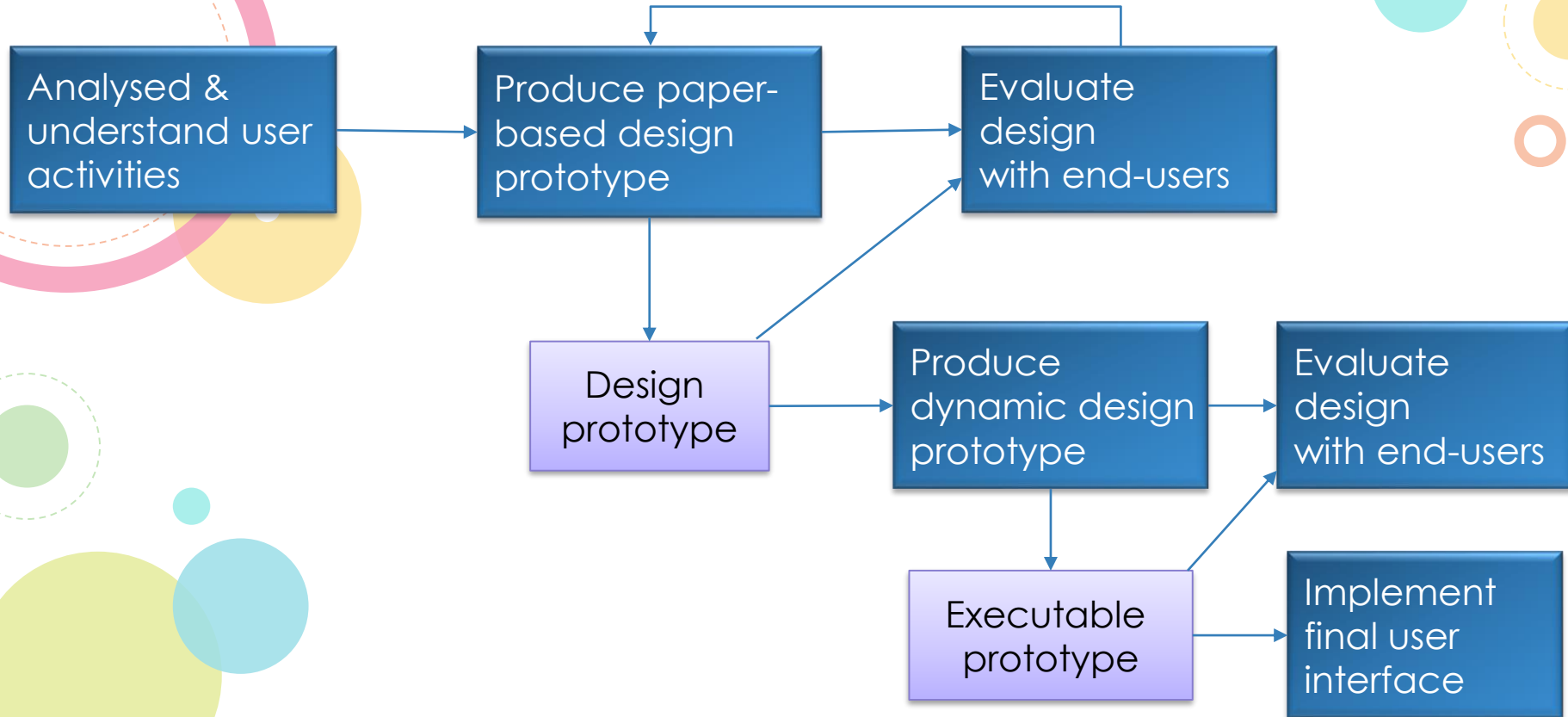
Lesson Objectives

- ② To describe the design principles of good user interface
- ② To discuss the guidelines of designing color in an user interface
- ② To assess the design of an user interface

Introduction

- ◎ The user interface of a system is often the yardstick by which that system is judged.
- ◎ An interface, which is difficult to use will, at best, result in a high level of user errors.

UI Design Process





Common Design Issues

- ◎ System response time
- ◎ User help facilities
- ◎ Error information handling
- ◎ Command labeling

Two Modes of Designs

- Basically, two modes of designs: -
 - text-based mode
 - GUI-based mode

```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\HP_Administrator>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : 71.112.21.100
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 71.112.21.1

Ethernet adapter {6155E97E-3B2E-49FE-BCC9-0B690A3FD34F}:

    Media State . . . . . : Media disconnected

C:\Documents and Settings\HP_Administrator>
```



Characteristics of GUI

- ⦿ Windows
- ⦿ Icons
- ⦿ Menus
- ⦿ Pointing
- ⦿ Graphics

Advantages of GUIs

- they are relatively easy to learn and use
- the user has multiple screens (windows) for system interaction
- fast, full-screen interaction is possible with immediate access to anywhere on the screen.

3 Golden Rules for a Good UI Design

1. **Place the user in control** – People do not like to be controlled by the machine and they like to know the **status** of the operation/ system.



3 Golden Rules for a Good UI Design

2. **Reduce the user's memory load** – people have limited short-term memory & they make mistakes when they handle too much info.



3 Golden Rules for a Good UI Design

3. **Make the interface consistent** – easy to learn and the knowledge learnt in one command or application is applicable in other parts of the system.



UI Design Principles

- ④ User interface design must take into account the needs, experience and capabilities of the system user.
- ④ User familiarity – should use the terms and concepts which are drawn from the experience of the users. E.g. Library system – operations: book in, book out, renew book etc.
- ④ Consistency – wherever possible, operations should be activated in the same way
- ④ Minimal surprise – users should never surprised by the behavior of a system



UI Design Principles

- **Recoverability** – should allow users to recover from errors, e.g. Undo function
- **User guidance** – provide help feature and meaningful feedback when errors occur
- **User diversity** – should provide appropriate interaction facilities for different types of system user. E.g. Experience user: very detailed step-by-step way to perform a function.

Key Issues in Interface Design

- ◎ The designer of a user interface to a computer is faced with two key issues:-
 - ◎ How can information from the user be provided to the computer system ?
 - ◎ How can information from the computer system be presented to the user?

Key Issues in Interface Design



Provide info



Key Issues in Interface Design



1. Direct Manipulation



E.g. resize graphic

Key Issues in Interface Design



2. Menu Selection/Menu Systems

Key Issues in Interface Design



4. Command Line/Command Language

```
ateMouse v1.9.1 alpha 1 [FreeDOS]
Installed at PS/2 port
C:\>ver

FreeCOM version 0.82 pl 3 XMS_Swap [Dec 10 2003 06:49:21]

C:\>dir
Volume in drive C is FREEDOS_C95
Volume Serial Number is 0E4F-19EB
Directory of C:\

DOS                <DIR>    08-26-04   6:23p
AUTOEXEC.BAT       435    08-26-04   6:24p
BOOTSECT.BIN       512    08-26-04   6:23p
COMMAND.COM        93,963  08-26-04   6:24p
CONFIG.SYS         801    08-26-04   6:24p
DOSBOOT.BIN        512    08-26-04   6:24p
KERNEL.SYS         45,815  04-17-04   9:19p
6 file(s)          142,038 bytes
1 dir(s)           1,064,517,632 bytes free
```

Key Issues in Interface Design



5. Natural Language

e.g. “delete the file named xxxx”

Key Issues in Interface Design

Present info



Key Issues in Interface Design



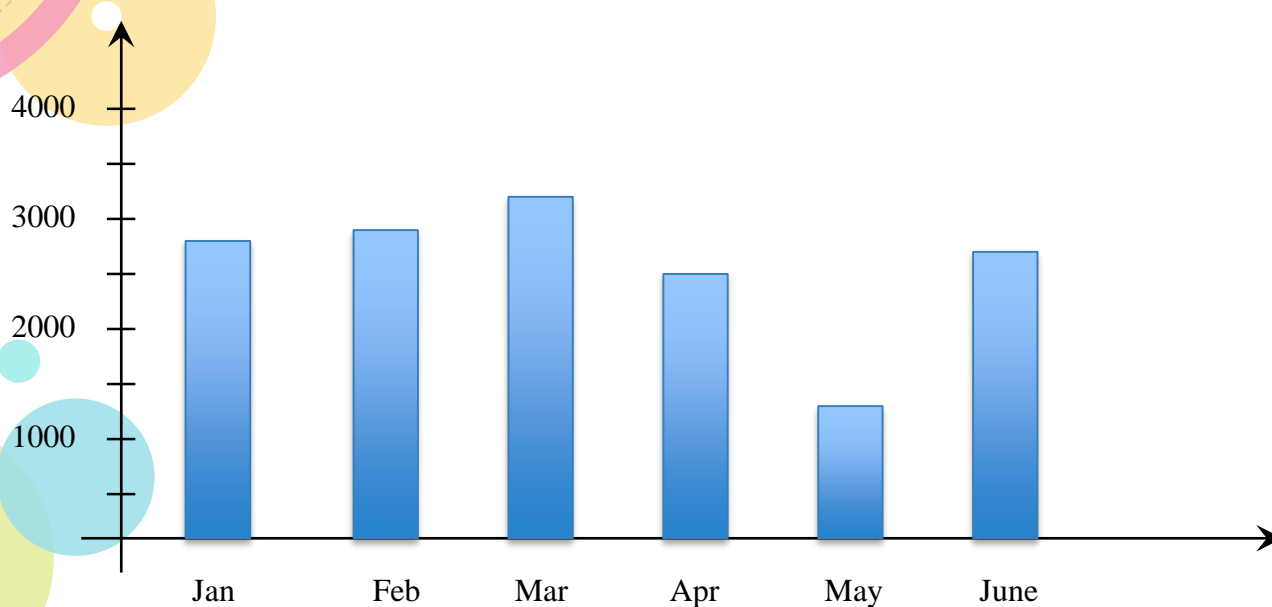
When presenting information to the users, the following factors must be taken into consideration:

1. Data Visualization
2. Color

Key Issues in Interface Design

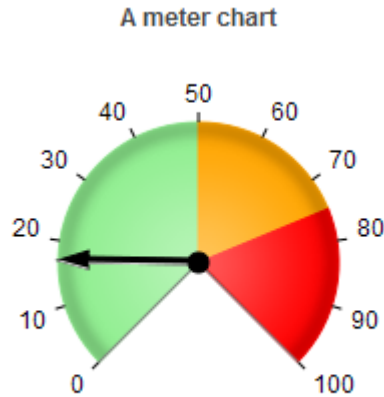
Example : Data Visualization (Textual vs. Graphical presentation)

Jan	Feb	Mar	Apr	May	June
2842	2851	3164	2500	1273	2835



Key Issues in Interface Design

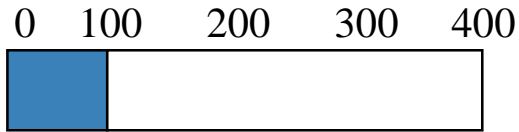
Example : Data Visualization (Present dynamically varying numeric information)



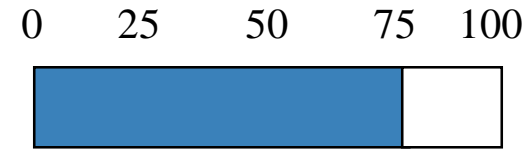
Key Issues in Interface Design

Example : Data Visualization (Graphical info display showing relative values)

Pressure



Temperature





Exercise

Q: Suggest a scenario to use Textual presentation and another scenario to use Graphical presentation.

Answer:

Textual presentation: Customer details, Order details, Account balance details, and etc.



Exercise

Q: Suggest a scenario to use Textual presentation and another scenario to use Graphical presentation.

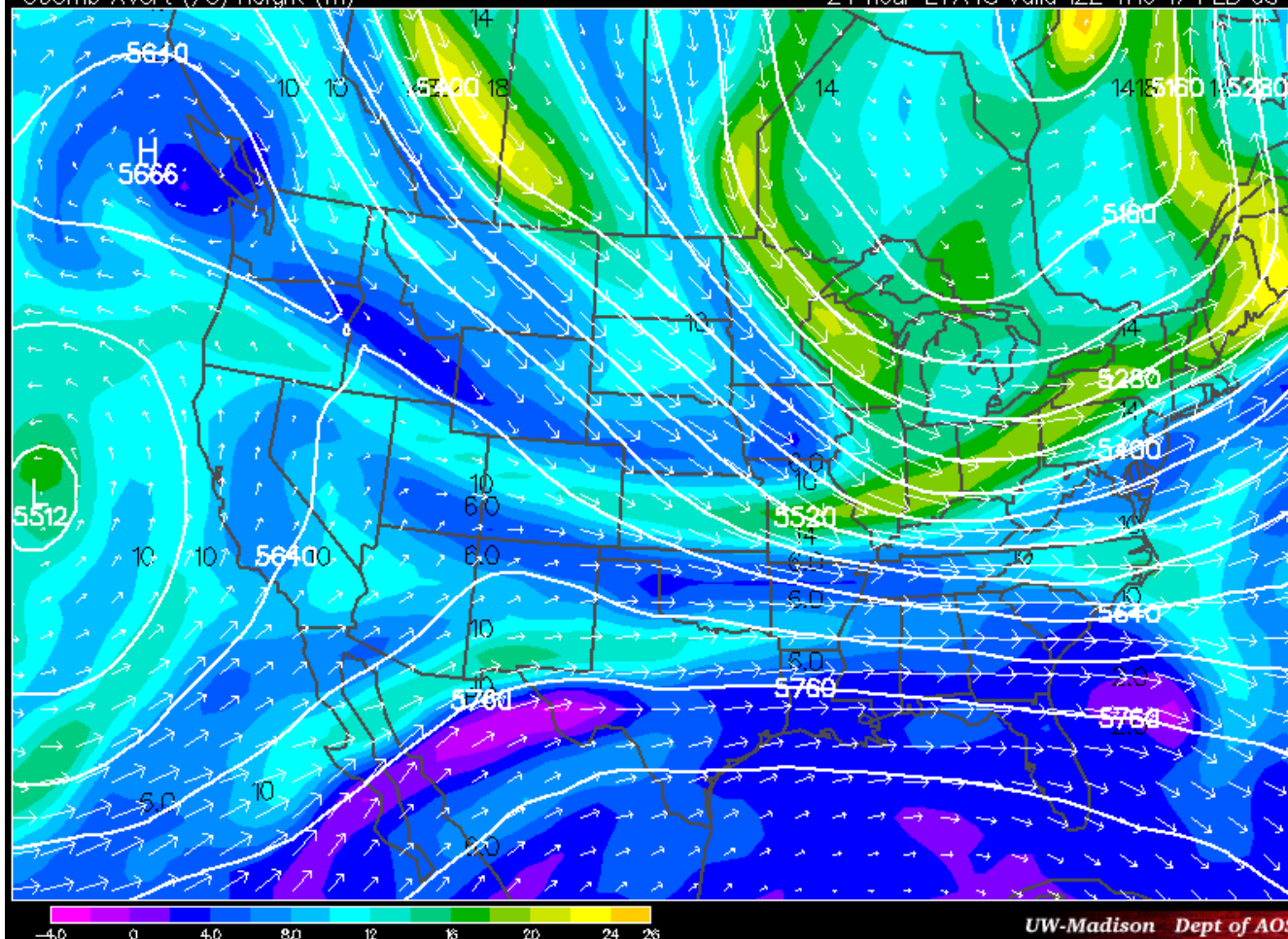
Answer:

Graphical presentation:

- ⦿ Weather information, gathered from a number of sources, is shown as a weather map with isobars, weather fronts and so on
- ⦿ The state of a telephone network is displayed graphically in a network management center

500mb Avort (/s) Height (m)

24 hour ETA48 valid 12Z THU 17 FEB 05



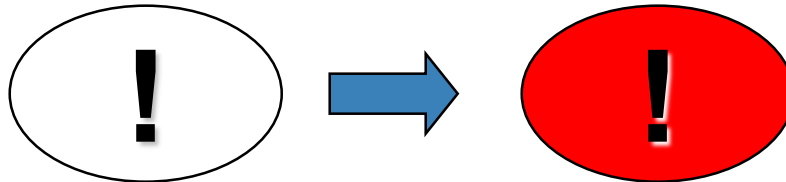
UW-Madison Dept of AOS

The Use of Colors – Errors in Using Colors

- ◎ Common errors made by designers when incorporating color in a user interface are: -
 - ◎ **Color is used to communicate meaning**
 - Color-blind may misinterpret the color
 - Human color perceptions are different
 - ◎ **Too many colors or the colors are too bright in the display**
 - Some colors cannot viewed comfortably for long
 - Cause confusion if colors are used inconsistently

Guidelines when Using Color

- ◎ **Limit** the number of colors used
 - < 5 colors in a window; < 7 colors in an interface
- ◎ Use color change to show a **change** in **system status**
 - Change of color means that a significant event has occurred.
 - E.g. change of color



Guidelines when Using Color

- ① Use color coding to **support the task** which users are trying to perform
 - similar tasks – same color
 - abnormal tasks – different color
- ② Use color coding in a thoughtful and **consistent** way
 - E.g. If using red for error message, all other parts should do the same.
- ③ Be careful about **color pairings**
 - Some color combinations may cause eyestrain & hard to read. E.g. Red on a blue display.

Guidelines when Using Color



Color pairing

Welcome to TARUC

Welcome to TARUC

Welcome to TARUC

Design Factors in Message Wording



- ✓ Context
- ✓ Experience
- ✓ Skill level
- ✓ Style
- ✓ Culture

Design Factors in Message Wording



Error #27 Invalid Patient ID

Bad File Name

Illegal Operations

Design Factors in Message Wording



Patient J. Bates is not known to the system

Click on Patients for a list of known patients

Click on Retry to re-input a patient name

Click on Help for more information

Patients

Retry

Help

Support Documentation for Users

- ◎ **A functional description**
 - description of services (system evaluators)
- ◎ **An introductory manual**
 - Getting started (beginner)
- ◎ **A system reference manual**
 - facility description (experienced users)

Support Documentation for Users

- ◎ **A system installation manual**
 - how to install system (system administrator)
- ◎ **A system administrator's manual**
 - operation & maintenance (system administrator)



Exercise

- ◎ Comment on the below user interface and suggest some ways to improve it (if any).

Student Registration Form

[Main](#)[Add](#)[Delete](#)[Search](#)[Print](#)

Gender

D.O.B

Name

Age

I/C No.

Address

Guidance Name

SPM Result

Guidance I/C

B. Malaysia

Course(1st choice)

English

Course(2nd choice)

Mathematics