

MIS 3360 Systems Analysis And Design

Day 20 | Chapter 10: Designing Forms & Reports

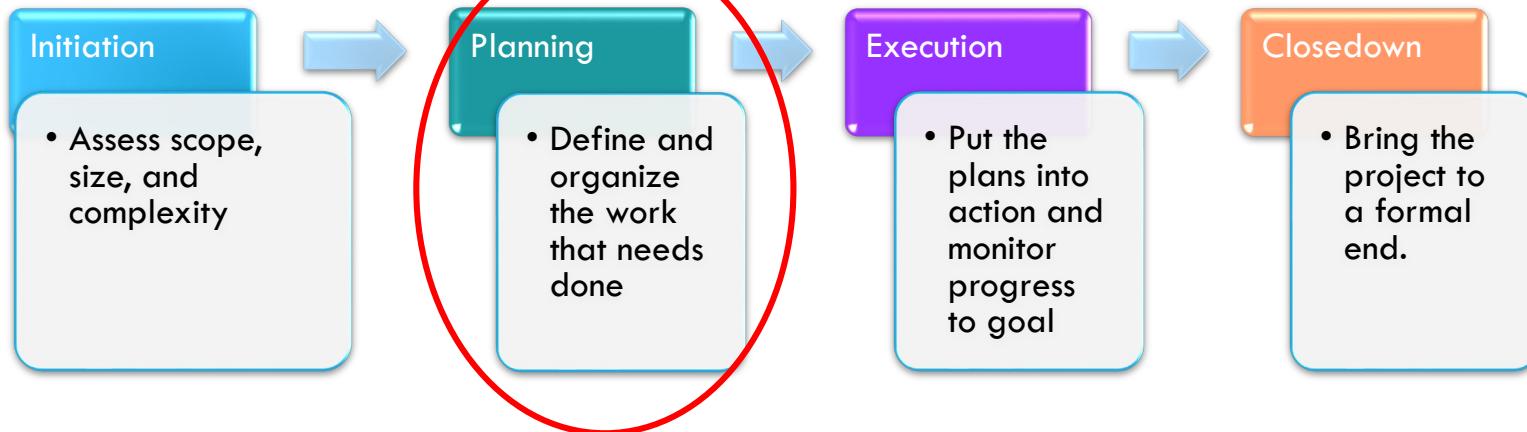
Image by Gerd Altmann on Pixabay.com

Class will begin shortly

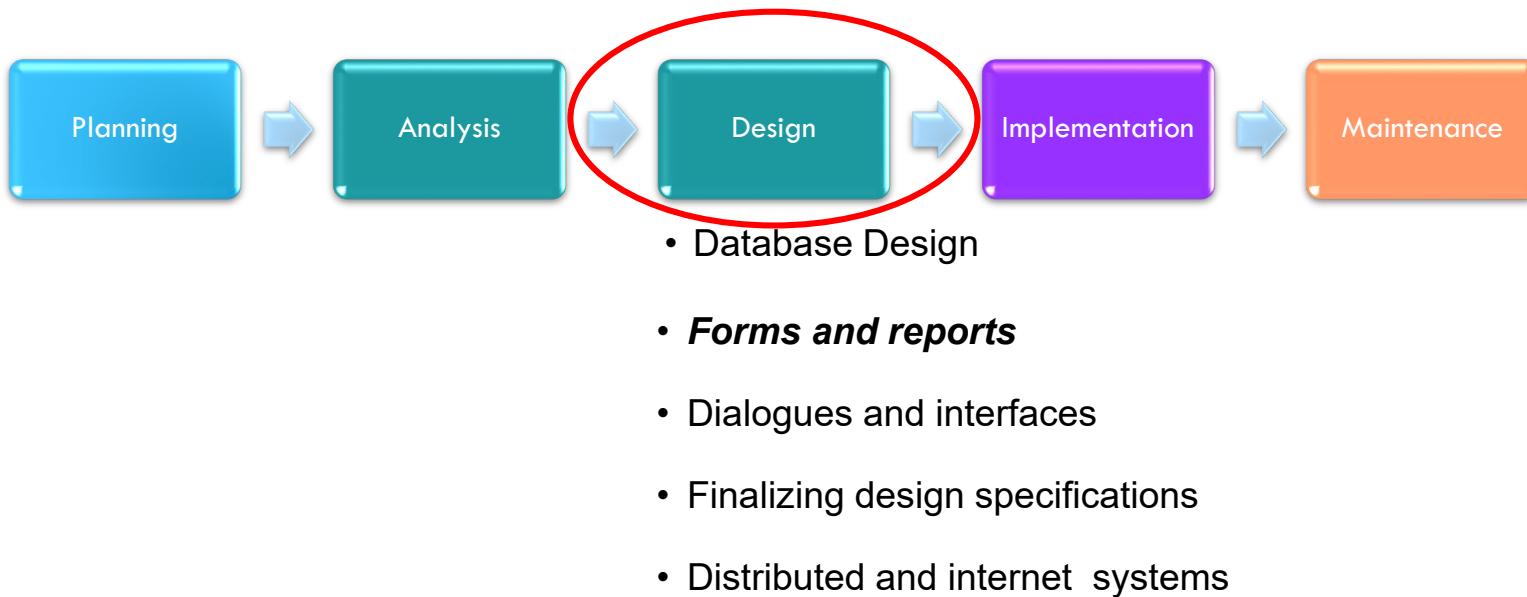
Designing Forms and Reports

Chapter 10
Modern Systems Analysis and Design
Valacich & George

Project Life Cycle



System Development Life Cycle



LEARNING OBJECTIVES

- ✓ Explain the process of designing forms and reports and the deliverables for their creation
- ✓ Apply the general guidelines for formatting forms and reports
- ✓ Use color and know when color improves the usability of information
- ✓ Format text, tables, and lists effectively
- ✓ Explain how to assess usability and describe the factors that influence usability
- ✓ Discuss guidelines for the design of forms and reports for Internet-based systems

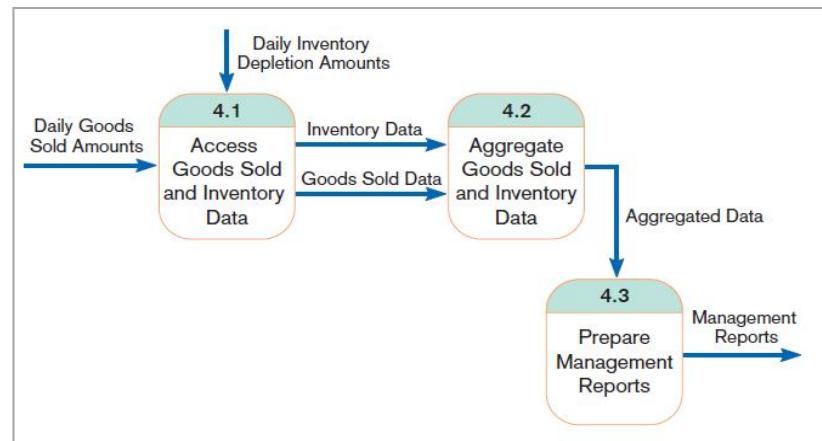
DIAGRAMS & DESIGN

Each **input** form/report corresponds to a data flow entering a DFD process

Each **output** form/report corresponds to a data flow produced by a DFD process

Form/report **data** consists of data elements within DFD data stores and on the E-R diagram for the application

During form/report design, diagrams should be updated as designs evolve



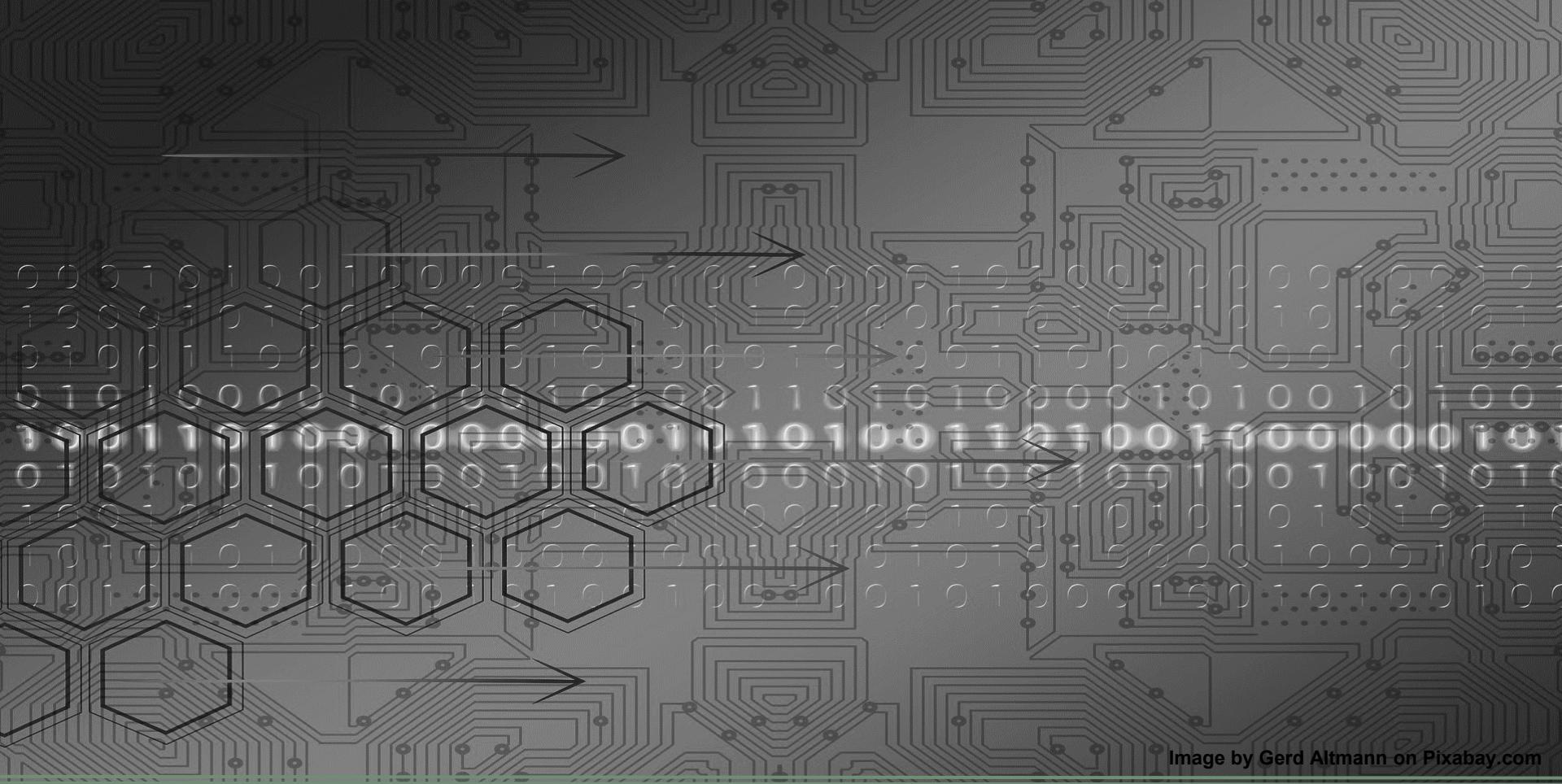


Image by Gerd Altmann on Pixabay.com

DESIGNING FORMS & REPORTS

FORMS

Form: Business document that contains some predefined data and may include areas where additional data are to be filled in

Instance of a form is typically based on one database record

Usually NOT in a simple row/column format

Examples

- Product order forms
- Employment applications
- Class registration forms

The image shows a registration form titled "REGISTRATION INFORMATION". The form consists of several input fields arranged vertically. Each field has a label on the left and a corresponding input box on the right. The fields are: FIRST NAME, LAST NAME, ADDRESS, CITY, STATE, ZIP, TITLE, COMPANY, PHONE NUMBER, E-MAIL ADDRESS, and WEBSITE. Below these fields is a large, dark blue rectangular button with the text "Submit Form" in white. The entire form is set against a white background with a black border around the main content area.

Analyzer 5

Home Reports Alerts Settings Ask ME Support

All Reports >> 127.0.0.1_PROXY

Website Details : 127.0.0.1_PROXY

Split up of Sites, Domains accessed and URLs

Hide All Tabs

Top Websites

Site Name	Total Bytes(MB)
research.zarca.com	11.65
mymarionsms.marion.k12.fl.us	6.12
tx02.stream.duplexfx.com	3.04
kh.google.com	2.83
www.sayitwithfavors.com	1.18
Others	14.21
Total	39.03

[Hide Table]

Top Domains

Domain	Hits	Total Bytes(MB)
.com	877	39.03
.us	626	11.65
.net	101	6.12
.org	13	3.04
.eb1	10	2.83
Others	41	1.18
Total	1668	39.03

[Hide Table]

Top Web Pages

URL	Hits	Total Bytes(MB)
search.zarca.com/	6	11.65
tream.duplexfx	2	3.04
le.com/flatti	198	2.83
oubleclic	1	1.01
s.marion.k	32	0.84
	1339	18.21
	1578	37.57

[Hide Table]

Top Denied Users

User	Hits	Total Bytes(MB)
	748	1

[Hide Table]

REPORTS

Report: Business document that contains only predefined data

Passive document (used only for reading/viewing data)

Typically contains data from many unrelated records

Examples

- Invoices
- Weekly sales summaries

TYPES OF REPORTS

TABLE 10-1 Common Types of Business Reports

Report Name	Description
Scheduled Reports	Reports produced at predefined intervals—daily, weekly, or monthly—to support the routine informational needs of an organization.
Key-Indicator Reports	Reports that provide a summary of critical information on a recurring basis.
Exception Reports	Reports that highlight data that are out of the normal operating range.
Drill-Down Reports	Reports that provide details behind the summary values on a key-indicator or exception report.
Ad-hoc Reports	Unplanned information requests in which information is gathered to support a nonroutine decision.

DESIGNING FORMS & REPORTS

User-centered design: aka. UX Design.

Design approach that involves an understanding of the target audience, their tasks and goals, information needs, experience levels, etc.

Typically follows a prototyping approach.



DESIGNING FORMS & REPORTS

Step 1: Information Gathering

Collect initial requirements during requirements determination.

TABLE 10-2 Fundamental Questions When Designing Forms and Reports

1. Who will use the form or report?
2. What is the purpose of the form or report?
3. When is the form or report needed and used?
4. Where does the form or report need to be delivered and used?
5. How many people need to use or view the form or report?

DESIGNING FORMS AND REPORTS

Step 2: Prototyping

Paper prototype: Series of mock screens that can be used to test content, look, and feel, as well as task flow and other usability factors

- Initial prototype designed from requirements
- Focus on layout/content

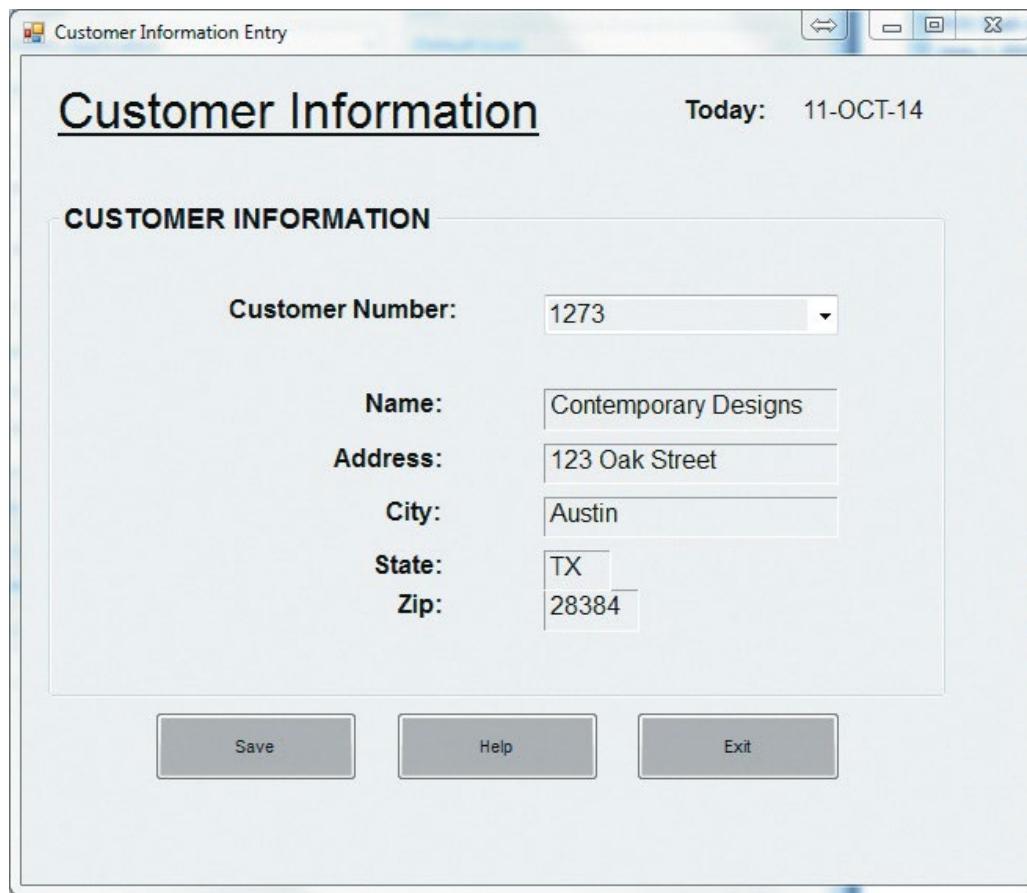
Classic tool: Coding sheet

Contemporary tools: Visual Basic and other computer-aided GUI-form and report generators

EXAMPLE: CODING SHEET

SYSTEM																																
PROGRAM	Customer Information Entry																															
PROGRAMMER	STAN	DATE																														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
C U S T O M E R I N F O R M A T I O N																																
----- ----- ----- ----- ----- ----- -----																																
C U S T O M E R N U M B E R :																																
NAME :																																
ADDRESS :																																
CITY :																																
STATE :																																
ZIP :																																

EXAMPLE: DESIGN IN VISUAL BASIC



WIREFRAMES

Simple design to show the placement of information elements on a screen and the space needed for each element

Can be used to quickly develop a series of screens so that users can get a sense of the look and feel of a design



DESIGNING FORMS AND REPORTS

Step 3: User Review

- Users review the prototype and accept it or request changes
- If users request changes, the construction-evaluation-refinement cycle is repeated until the design is accepted
- Several iterations of the cycle occur during the design of a single form/report

DELIVERABLES AND OUTCOMES

Major deliverable: Design specifications

Sections in the design specification:

- 1. Narrative overview:** Characterizes users, tasks, system, and environmental factors
 - Purpose: Explains why the form/report exists and how it will be used
 - Content: Lists general information and assumptions that helped shape the design
 - May be unnecessary for simple designs
- 2. Sample design:** Image of the form/report
- 3. Testing and usability assessment:** Testing/usability assessment

FORMATTING FORMS AND REPORTS

TABLE 10-3 General Guidelines for the Design of Forms and Reports

Meaningful Titles:

- Clear and specific titles describing content and use of form or report
- Revision date or code to distinguish a form or report from prior versions
- Current date, which identifies when the form or report was generated
- Valid date, which identifies on what date (or time) the data in the form or report were accurate

Meaningful Information:

- Only needed information should be displayed
- Information should be provided in a manner that is usable without modification

Balance the Layout:

- Information should be balanced on the screen or page
- Adequate spacing and margins should be used
- All data and entry fields should be clearly labeled

Design an Easy Navigation System:

- Clearly show how to move forward and backward
- Clearly show where you are (e.g., page 1 of 3)
- Notify user when on the last page of a multipaged sequence

CUSTOMER INFORMATION		
CUSTOMER NO:	1273	
NAME:	CONTEMPORARY DESIGNS	
ADDRESS:	123 OAK ST.	
CITY-STATE-ZIP:	AUSTIN, TX 78384	
YTD-PURCHASE:	47,285.00	
CREDIT LIMIT:	10,000.00	
YTD-PAYMENTS:	42,656.65	
DISCOUNT %:	5.0	
PURCHASE:	21-JAN-14	22,000.00
PAYMENT:	21-JAN-14	13,000.00
PURCHASE:	03-MAR-14	16,000.00
PAYMENT:	03-MAR-14	15,500.00
PAYMENT:	23-MAY-14	5,000.00
PURCHASE:	12-JUL-14	9,285.00
PAYMENT:	12-JUL-14	3,785.00
PAYMENT:	22-SEP-14	5,371.65
STATUS:	ACTIVE	

Vague title

Difficult to read: information
is packed too tightly

No navigation information

No summary
of account activity

FIGURE 10-5
(b) Improved design
for form

Easy to read:
clear, balanced layout

Clear title

Pine Valley Furniture

Detail Customer Account Information

Page: 2 of 2

Today: 11-OCT-14

Customer Number: 1273

Name: Contemporary Designs

DATE	PURCHASE	PAYMENT	CURRENT BALANCE
01-Jan-14			0.00
21-Jan-14	(22,000.00)		(22,000.00)
21-Jan-14		13,000.00	(9,000.00)
03-Mar-14	(16,000.00)		(25,000.00)
03-Mar-14		15,500.00	(9,500.00)
23-May-14		5,000.00	(4,500.00)
12-Jul-14	(9,285.00)		(13,785.00)
12-Jul-14		3,785.00	(10,000.00)
22-Sep-14		5,371.65	(4,628.35)
YTD-SUMMARY	(47,285.00)	42,656.65	(4,628.35)

Help

Prior Screen

Exit

Summary of account information

Clear navigation information

HIGHLIGHTING INFORMATION

Should be used **sparingly**, consistently, and **RELATIVE** to the information's **importance**.

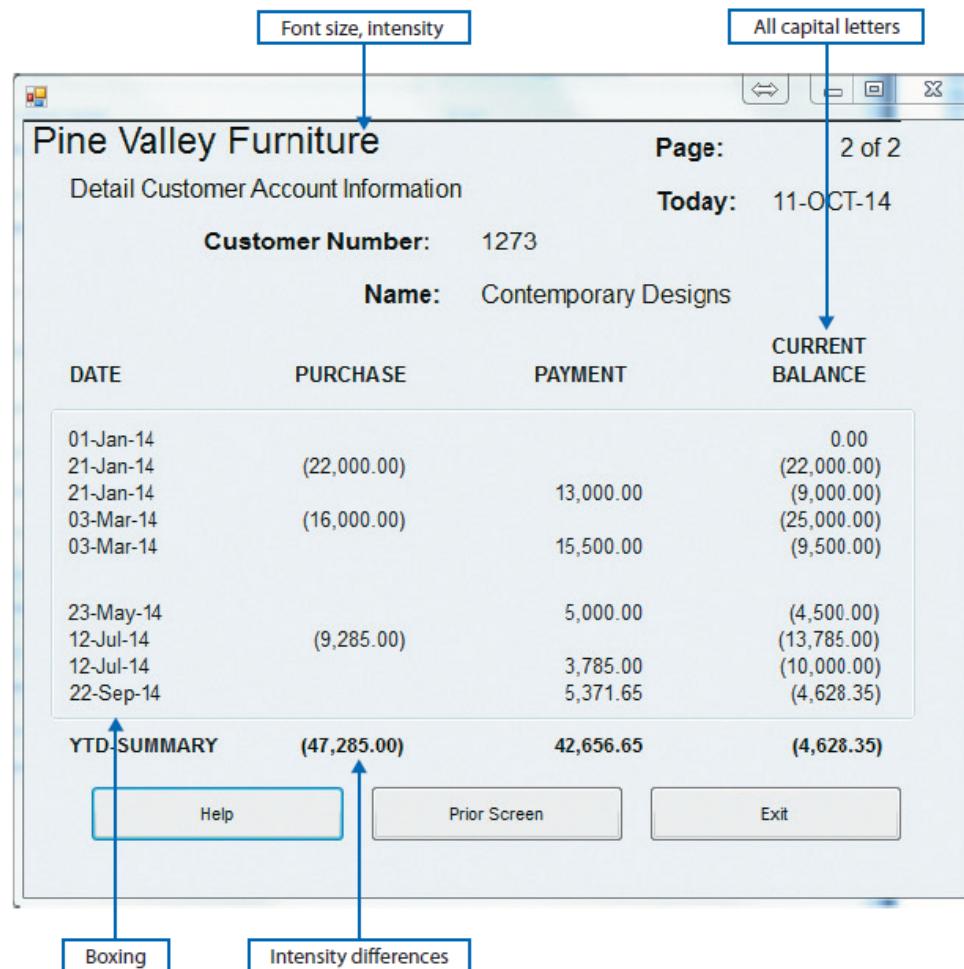
When to highlight?

- Notify users of **errors** in data entry or processing
- Provide **warnings** about possible problems
- Draw **attention** to keywords, commands, high-priority messages, etc.

HIGHLIGHTING CAN INCLUDE

- UPPER CASE
- **bold**
- *italics*
- underlining
- **boxing**
- **size** and **color** differences
- blinking
- reverse video
- audible tones
- **intensity** differences
- offsetting nonstandard information

HIGHLIGHTING EXAMPLE



COLOR VS. NO COLOR

TABLE 10-5 Benefits and Problems from Using Color

Benefits from Using Color:

- Soothes or strikes the eye.
- Accents an uninteresting display.
- Facilitates subtle discriminations in complex displays.
- Emphasizes the logical organization of information.
- Draws attention to warnings.
- Evokes more emotional reactions.

Problems from Using Color:

- Color pairings may wash out or cause problems for some users (e.g., color blindness).
- Resolution may degrade with different displays.
- Color fidelity may degrade on different displays.
- Printing or conversion to other media may not easily translate.

(Source: Based on Shneiderman, et al., 2009; Benbasat, Dexter, and Todd, 1986.)

DISPLAYING TEXT

TABLE 10-6 Guidelines for Displaying Text

Case	Display text in mixed uppercase and lowercase and use conventional punctuation.
Spacing	Use double spacing if space permits. If not, place a blank line between paragraphs.
Justification	Left-justify text and leave a ragged-right margin.
Hyphenation	Do not hyphenate words between lines.
Abbreviations	Use abbreviations and acronyms only when they are widely understood by users and are significantly shorter than the full text.

AN EXAMPLE OF BAD TEXT DISPLAY

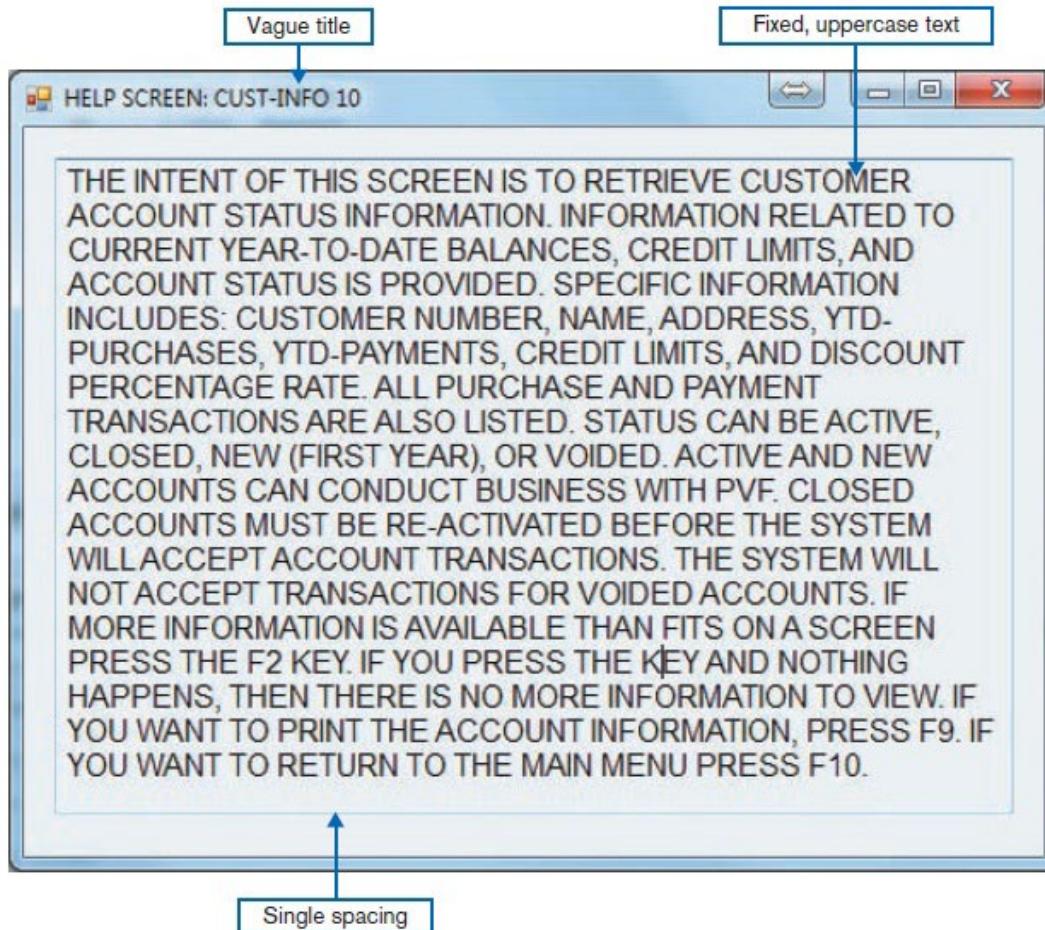
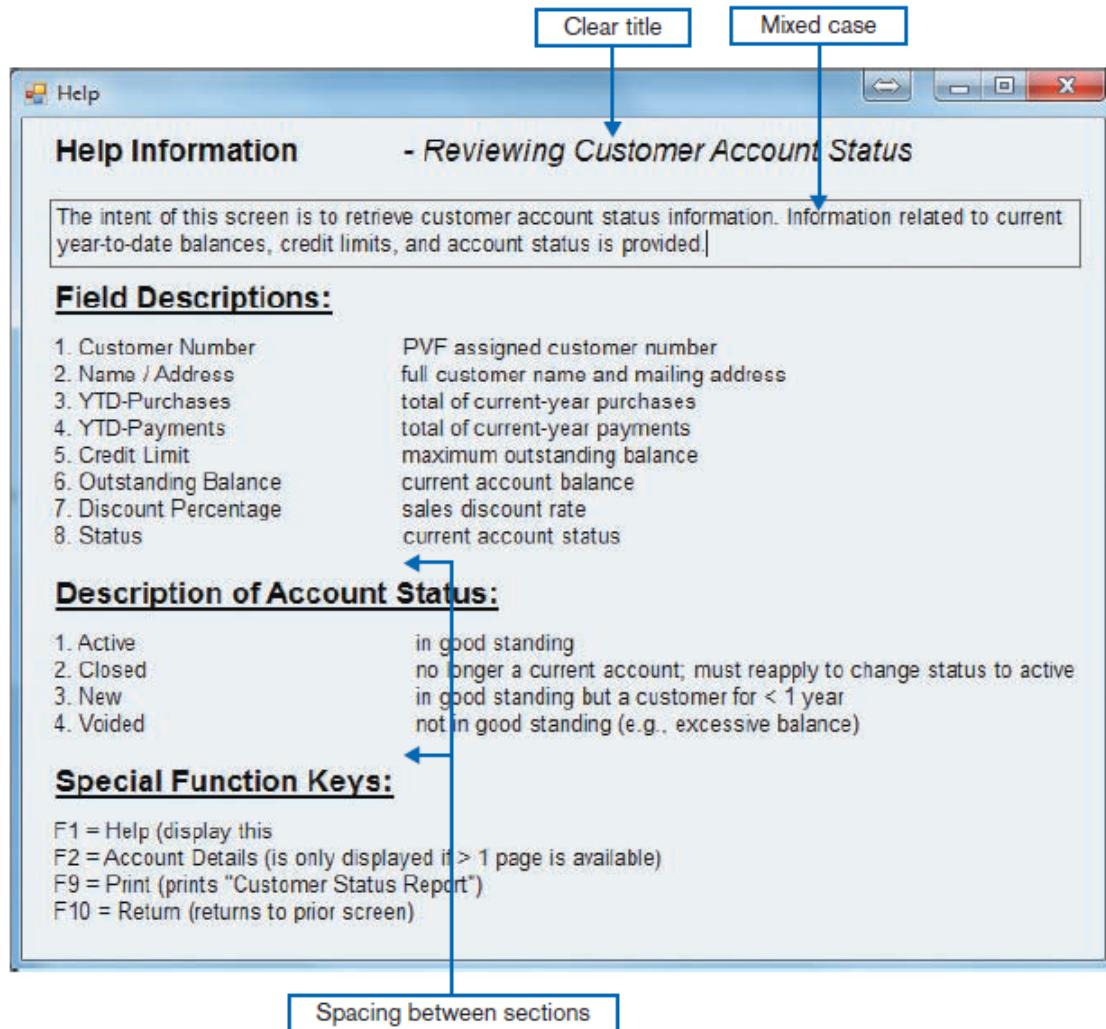


FIGURE 10-7

Contrasting the display of textual help information
(Source: Microsoft Corporation.)

(a) Poorly designed help screen with many violations of the general guidelines for displaying text

A BETTER EXAMPLE OF TEXT DISPLAY



FOR READABILITY

Font	San Serif, Roman, Monospaced.	Verdana
Font size	10, 12, or 14 pt	Arial
Spacing	Two spaces after a sentence. Short paragraphs	Helvetica
Justification	Align left	Courier
Highlighting	Bold	Comic Sans
Background	non-white	Read Regular
		Dyslexie

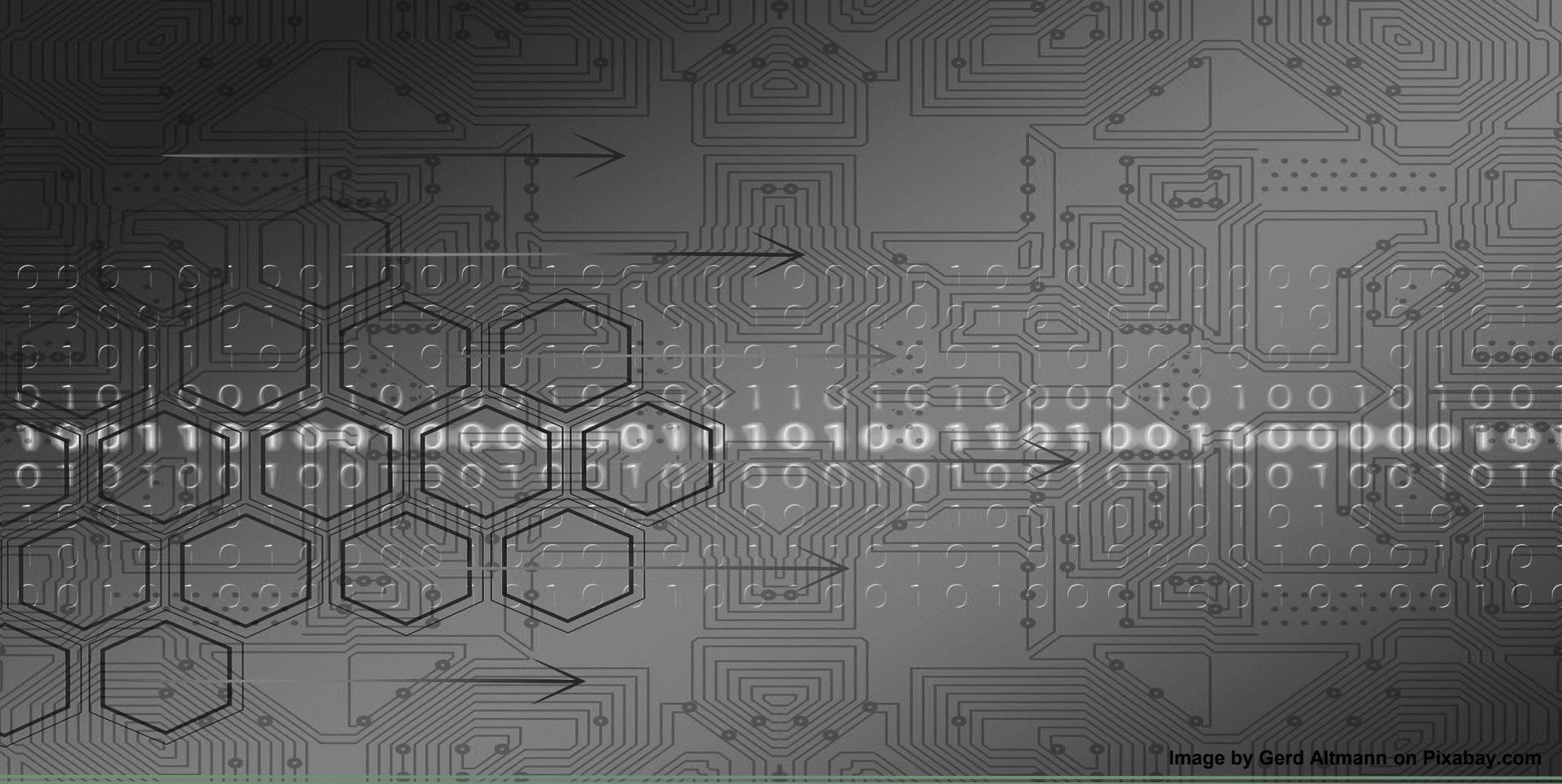


Image by Gerd Altmann on Pixabay.com

DESIGNING TABLES AND LISTS

TABLE 10-7 General Guidelines for Displaying Tables and Lists

Use Meaningful Labels:

All columns and rows should have meaningful labels.

Labels should be separated from other information by using highlighting.

Redisplay labels when the data extend beyond a single screen or page.

Formatting Columns, Rows, and Text:

Sort in a meaningful order (e.g., ascending, descending, or alphabetic).

Place a blank line between every five rows in long columns.

Similar information displayed in multiple columns should be sorted vertically (ie., read from top to bottom, not left to right).

Columns should have at least two spaces between them.

Allow white space on printed reports for user to write notes.

Use a single typeface, except for emphasis.

Use same family of typefaces within and across displays and reports.

Avoid overly fancy fonts.

Formatting Numeric, Textual, and Alphanumeric Data:

Right-justify *numeric data* and align columns by decimal points or other delimiter.

Left-justify *textual data*. Use short line length, usually 30–40 characters per line (this is what newspapers use, and it is easier to speed-read).

Break long sequences of *alphanumeric data* into small groups of three to four characters each.

BAD TABLE DESIGN

CUSTOMER INFORMATION		
CUSTOMER NO:	1273	
NAME:	CONTEMPORARY DESIGNS	
ADDRESS:	123 OAK ST.	
CITY-STATE-ZIP:	AUSTIN, TX 28384	
YTD-PURCHASE:	47,285.00	
CREDIT LIMIT:	10,000.00	
YTD-PAYMENTS:	42,656.65	
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PAYMENT:	21-JAN-14	13,000.00
PURCHASE:	03-MAR-14	16,000.00
PAYMENT:	03-MAR-14	15,500.00
PAYMENT:	23-MAY-14	5,000.00
PURCHASE:	12-JUL-14	9,285.00
PAYMENT:	12-JUL-14	3,785.00
PAYMENT:	22-SEP-14	5,371.65
STATUS:	ACTIVE	

BETTER TABLE DESIGN

Clear and separate column labels for each data type

Pine Valley Furniture

Detail Customer Account Information

Customer Number: 1273

Name: Contemporary Designs

Page: 2 of 2

Today: 11-OCT-14

DATE	PURCHASE	PAYMENT	CURRENT BALANCE
01-Jan-14			0.00
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22-Sep-14		5,371.65	(4,628.35)
YTD-SUMMARY	(47,285.00)	42,656.65	(4,628.35)

Help Prior Screen Exit

Numeric data are right justified

TABLES VS. GRAPHS

Tables: Use for

- Reading individual data values
- Multiple columns or dimensions

Graphs: Use for

- Providing quick summary
- Displaying trends over time
- Comparing points/patterns of variables
- Forecasting activity
- Simple reporting of vast quantities of information

EXAMPLE: TABLE

Pine Valley Furniture Salesperson Annual Summary Report, 2013						
January 10, 2014			Page 1 of 2			
Region	Salesperson	SSN	Quarterly Actual Sales			
			First	Second	Third	Fourth
Northwest & Mountain	Baker	999-99-9999	195,000	146,000	133,000	120,000
	Hawthorne	999-99-9999	220,000	175,000	213,000	198,000
	Hodges	999-99-9999	110,000	95,000	170,000	120,000
Midwest & Mid-Atlantic	Franklin	999-99-9999	110,000	120,000	170,000	90,000
	Stephenson ¹	999-99-9999	75,000	66,000	80,000	80,000
	Swenson	999-99-9999	110,000	98,000	100,000	90,000
New England	Brightman	999-99-9999	250,000	280,000	260,000	330,000
	Kennedy	999-99-9999	310,000	190,000	270,000	280,000

¹Sales reflect July 1, 2013 – December 31, 2013.

Place meaningful labels on all columns and rows

Alphabetic text is left justified

Use a meaningful title

Box the table data to improve the appearance of the table

Superscript characters can be used to alert reader of more detailed information

Sort columns in some meaningful order (names are sorted alphabetically within region)

Long sequence of alphanumeric data is grouped into smaller segments

Right justify all numeric data

Try to fit table onto a single page to help in making comparisons

EXAMPLE: GRAPHS

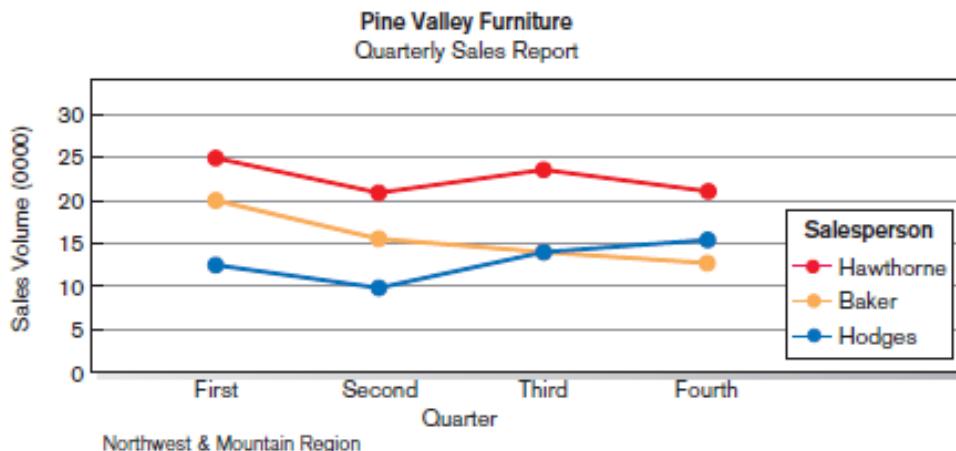
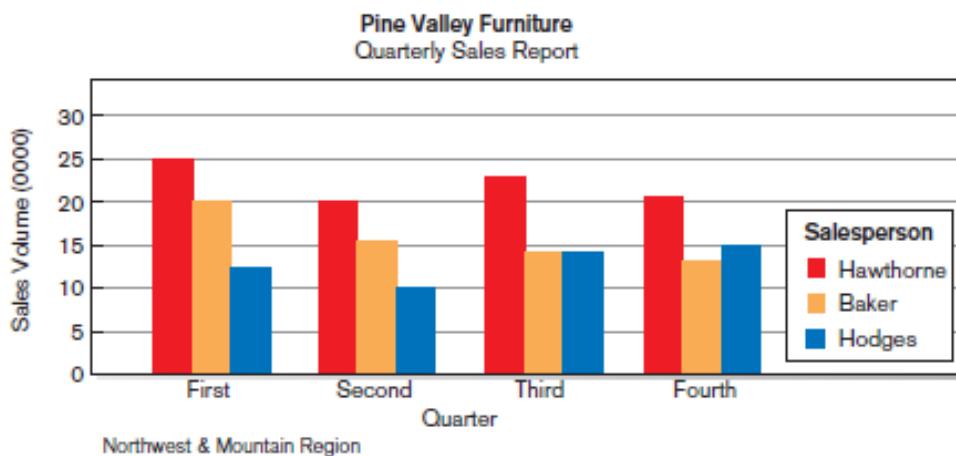


FIGURE 10-10
Graphs for comparison

(a) Line graph



(b) Bar graph

PAPER VS. ELECTRONIC REPORTS

- Some printers don't allow reproductions of screen displays
- Color and/or resolution limitations
- Some people prefer printed reports when there is a lot of information to absorb. Research shows you don't retain as much information from a screen
- There may be legal requirements to provide printed reports

Follow a prototyping process to evaluate report displays

ASSESSING USABILITY

Usability: Overall evaluation of how a system performs in supporting a particular user for a particular task

Objective for designing forms, reports, and all human-computer interactions

Characteristics:

- **Speed:** Can you complete a task efficiently?
- **Accuracy:** Does the system provide what you expect?
- **Satisfaction:** Do you like using the system?

USABILITY CONSIDERATIONS

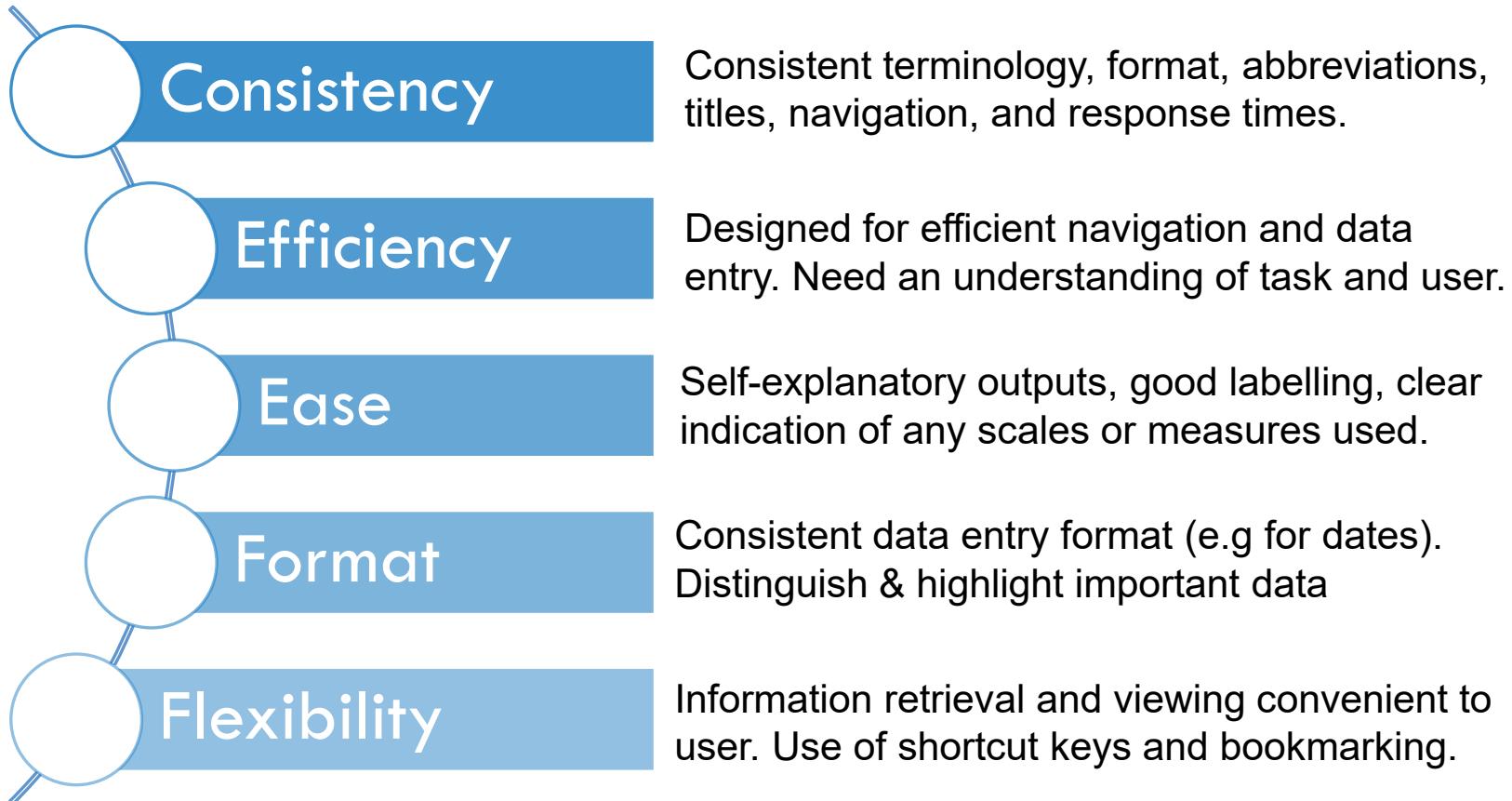
User: Experience, skills, motivation, education, personality, potential accessibility issues

Task: Time pressure, cost of errors, work durations

System: Platform

Environment: Social and physical issues

USABILITY SUCCESS FACTORS



See *Table 10-9* in the text book

USABILITY METRICS

Learnability: How difficult is it for a user to perform a task for the first time? How quickly can they learn to use it?

Efficiency: How quickly can users perform tasks once they know how to perform them?

Error rate: How many errors might a user encounter, and how easy is it to recover from those errors?

Memorability: How easy is it to remember how to accomplish a task when revisiting the system after some period of time?

Satisfaction and aesthetics: How enjoyable is the system's visual appeal and how enjoyable is the system to use?

TABLE 10-11 Common Errors When Designing the Layout of Web Pages

Error	Recommendation
Nonstandard Use of GUI Widgets	Make sure that when using standard design items, they behave in accordance with major interface design standards. For example, the rules for radio buttons state that they are used to select one item among a set of items, that is, not confirmed until “OK’ed” by a user. In many websites selecting radio buttons is used as both selection and action.
Anything That Looks Like Advertising	Because research on Web traffic has shown that many users have learned to stop paying attention to Web advertisements, make sure that you avoid designing any legitimate information in a manner that resembles advertising (e.g., banners, animations, pop-ups).
Bleeding-Edge Technology	Make sure that users don’t need the latest browsers or plug-ins to view your site.
Scrolling Text and Looping Animations	Avoid scrolling text and animations because they are both hard to read and users often equate such content with advertising.
Nonstandard Link Colors	Avoid using nonstandard colors to show links and for showing links that users have already used; nonstandard colors will confuse the user and reduce ease of use.
Outdated Information	Make sure your site is continuously updated so that users “feel” that the site is regularly maintained and updated. Outdated content is a sure way to lose credibility.
Slow Download Times	Avoid using large images, lots of images, unnecessary animations, or other time-consuming content that will slow the downloading time of a page.
Fixed-Formatted Text	Avoid fixed-formatted text that requires users to scroll horizontally to view content or links
Displaying Long Lists as Long Pages	Avoid requiring users to scroll down a page to view information, especially navigational controls. Manage information by showing only N items at a time, using multiple pages, or by using a scrolling container within the window.