

# Designing Effective Input

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Systems Analysis and Design, 7e  
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# Learning Objectives

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- Design input forms for users of business systems
- Design engaging input displays for users of information systems
- Design useful input forms for people interacting on the Web
- Design useful input pages for users of intranets and the Internet

# Input Design Objectives

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- The quality of system input determines the quality of system output
- Input design objectives:
  - Effectiveness
  - Accuracy
  - Ease of use
  - Consistency
  - Simplicity
  - Attractiveness

# Major Topics

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- Input design
- Form design
- Display design
- GUI screen design
- GUI controls
- Web design guidelines

# Good Form Design

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- Make forms easy to fill in
- Ensure that forms meet the purpose for which they are designed
- Design forms to assure accurate completion
- Keep forms attractive

# Make Forms Easy to Fill in

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- Form flow
- Seven sections of a form
- Captioning

[cuduongthancong . com](http://cuduongthancong.com)

[cuduongthancong . com](http://cuduongthancong.com)

# Form Flow

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- Can minimize the time and effort expended by employees in form completion
- Should flow from left to right and top to bottom

# Seven Sections of a Form

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- Heading
- Identification and access
- Instructions
- Body
- Signature and verification
- Totals
- Comments



# Figure 12.1 Seven sections found in well-designed forms

The diagram illustrates the layout of a well-designed form, divided into seven distinct sections. The sections are arranged as follows:

- Heading**: Located at the top left.
- Identification and Access**: Located at the top right, adjacent to the Heading.
- Instructions**: Located below the Heading and Identification and Access sections.
- Body**: A large central area for data entry, located below the Instructions section.
- Signature and Verification**: Located at the bottom left, below the Body section.
- Totals**: Located at the bottom right, adjacent to the Signature and Verification section.
- Comments**: Located at the very bottom, spanning the width of the form.

The form is presented on a light orange background with a subtle watermark reading "cuu duong than cong . com".

# Caption Types

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- Line caption
  - Putting the caption on the same line or below the line
- Boxed caption
  - Providing a box for data instead of a line
- Check off caption
  - Lining up choices or alternatives vertically
- Horizontal check off caption
  - Lining up choices or alternatives horizontally
- Table caption
  - Work well in the body of a form
- Combination

## Figure 12.2 Major captioning alternatives

[illegible]

# Meeting the Intended Purpose

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- Systems analysts may use different types of specialty forms for different purposes
- Specialty forms
  - Multiple-part
  - Continuous-feed
  - Perforated

# Ensuring Accurate Completion

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- To reduce error rates associated with data collection, forms should be designed to assure accurate completion
- Design forms to make people do the right thing with the form

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# Keeping Forms Attractive

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- Aesthetic forms draw people into them and encourage completion
- Forms should look uncluttered, and elicit information in the expected order
- Using different fonts and line weights within the same form can help make it more attractive for users

# Computer-Assisted Form Design

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- Numerous form design packages are available for PCs
- Electronic forms can have intelligence that supports users in their tasks

# Figure 12.4 Software for electronic form design has many dynamic features

## Features of Electronic Form Design Software

- Gives the ability to design paper forms, electronic forms, or Web-based forms using one integrated package
- Allows form design using form templates
- Enables form design by cutting and pasting familiar shapes and objects
- Facilitates electronic form completion through use of a companion data entry software package
- Permits customization of electronic form completion with the capability to customize menus, toolbars, keyboards, and macros
- Supports integration with popular databases
- Enables the sending and broadcasting of electronic forms
- Permits sequential routing of forms
- Assists tracking of routed forms
- Encourages automatic delivery and processing (push technology for forms)
- Allows the development of roles databases (that show relationships between people and types of information)
- Establishes security protection for electronic forms
- Takes scanned paper forms and permits publishing them to the Web
- Creates electronic fields automatically from scanned paper forms
- Permits form fill-in on the Web
- Allows calculations to be accomplished automatically



**Figure 12.5** Omniform from ScanSoft allows the user to take an existing form, scan it into the computer, and define fields so the form can be easily filled out on a PC

The screenshot displays the Omniform software interface, titled "Omniform - [Employment Application]". The window includes a menu bar (File, Edit, View, Format, Tools, Window, Help) and a toolbar with various icons. On the left, a "Proofreader" panel lists options: Introduction, Form Image, Spelling, Color Adjustment, Text Formatting, Object Appearance, Line Recovery, Field Names, Tab Grouping, Printable Area, and Final Adjustments. Below this, an "Introduction" section provides instructions on using the Proofreader tool. The main area shows a scanned employment application form for "Winston & Stanley". The form includes fields for Name (Last, First, Middle), Address (Street, City, State, Zip Code), Telephone (Area Code), Social Security Number, Driver's License Number, State, and Expiration Date. It also contains checkboxes for "Have you ever been convicted of a felony in the last seven years?" and "Are you a citizen of the United States?". The "JOB INTERESTS/SKILLS" section includes fields for Position(s) applied for, Salary Desired, and checkboxes for "Have you applied for a position here before?". It also has checkboxes for "Type of employment requested" (Full Time, Part Time, Temporary, Summer) and fields for "Date you could begin working" and "Typing Speed (WPM)". A final section for "Summarize any other special skills or qualifications" is at the bottom. The Windows taskbar at the bottom shows the Start button, several application icons, and the system clock displaying 9:53 PM.

**Winston & Stanley**  
100 Nathan Lane  
Gramercy, NY 14200  
1-800-5551212

**Winston & Stanley**  
**EMPLOYMENT APPLICATION**

*An equal opportunity employer.*

**PERSONAL**

Name     
(Last) (First) (Middle)

Address      
(Street) (City) (State) (Zip Code)

Telephone  Social Security Number   
(Area Code)

Driver's License Number  State  Expiration Date

Have you ever been convicted of a felony in the last seven years? ☐ Yes ☐ No Explain Felony

Are you a citizen of the United States? ☐ Yes ☐ No

**JOB INTERESTS/SKILLS**

Position(s) applied for  Salary Desired

Have you applied for a position here before? ☐ Yes ☐ No If yes, when?

Type of employment requested ☐ Full Time ☐ Part Time ☐ Temporary ☐ Summer

Date you could begin working  Typing Speed (WPM)

Summarize any other special skills or qualifications

# Controlling Business Forms

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- Making sure that each form in use fulfills its specific purpose
- Making sure that the specified purpose is integral to organizational functioning
- Preventing duplication of information collected and of the forms that collect it
- Designing effective forms
- Deciding on how to reproduce forms in the most economical way
- Establishing procedures that make forms available, at the lowest possible cost

# Good Display and Web Forms Design

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- Keep the display simple
- Keep the display presentation consistent
- Facilitate user movement among display screens and pages
- Create an attractive and pleasing display

# Keeping the Display Simple

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- Heading
- Body
- Comments and instructions

# Keeping the Display Consistent

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- Locate information in the same area each time a new display is accessed
- Information that logically belongs together should be consistently grouped together
- Information should not overlap from one group to another

# Facilitating Movement

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- The three-clicks rule says that users should be able to get to the screens they need within three mouse or keyboard clicks
- Movement among screens:
  - Scrolling by using arrows or PgDn keys
  - Context-sensitive pop-up windows
  - Onscreen dialogue

# Designing an Attractive and Pleasing Display

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- Should draw users into them and hold their attention
- Use logical flows in the plan to your display pages
- Thickness of separation lines between subcategories
- Color or shaded boxes and creating three-dimensional boxes and arrows

## Figure 12.8 You can design an attractive data entry screen with a three-dimensional effect using JetFlow's FormFlow

The screenshot displays a Windows-style application window titled "Leads Tracking Demo - [Lead Tracking Info]". The window features a menu bar with "File", "Edit", "View", "Locate", and "Help". Below the menu bar is a toolbar with navigation buttons (back, forward, etc.), a "CLOSE" button, and a "Switch Form" button. The main content area is divided into two primary sections. On the left, a vertical label "CONTACT INFORMATION" is positioned next to a form with a 3D bevel effect. This form contains fields for "CUSTOMER No." (CIC0000), "ENTRY DATE" (Oct 25 1997), "Company Name:", "Contact Name:", "Address 1:", "Address 2:", "City:", "State / Province:", "Country:", "ZIP / Postal code:", "Telephone No:", and "Fax No:". On the right, the "CUSTOMER TYPE:" section includes a "SERIAL NUMBER" field (RS0000) and a "Where did you hear about us?" field. Below these are "Workstation Types" (Dos, Win/Dos, OS/2, Unix, Mac) and "Usage" (Personal, Client Server) sections, each with checkboxes. A "Network" section includes checkboxes for Novell, Banyan, and Peer-To-Peer. A "Messaging System" section includes checkboxes for MHS, CC Mail, and MS Mail. At the bottom right, there is a "NOTES:" section. A large, stylized "LEAD TRACKING" logo is centered at the bottom of the form area. The status bar at the bottom of the window shows "FormFlow Lead Tracking Model Contact Information Form", a "(New Record)" button, a "Field COMPANY" dropdown, a "Pg 1/2" indicator, and a "L" button. The Windows taskbar at the very bottom shows the "Start" button, open applications including "FormFlow Form D...", "Leads Tracki...", and "Microsoft Access", and a system clock showing "6:57 PM".

**Leads Tracking Demo - [Lead Tracking Info]**

File Edit View Locate Help

Navigation buttons: [Back] [Forward] [Home] [Close] [Switch Form]

**CONTACT INFORMATION**

**CUSTOMER No.**  
CIC0000

**ENTRY DATE**  
Oct 25 1997

Company Name:

Contact Name:

Address 1:

Address 2:

City:

State / Province: Country: ZIP / Postal code:

Telephone No:

Fax No:

**CUSTOMER TYPE:**

SERIAL NUMBER  
RS0000

Where did you hear about us?

**Workstation Types**

☐ Dos ☐ Win/Dos ☐ OS/2 ☐ Unix ☐ Mac

**Usage**

☐ Personal ☐ Client Server

**Network**

☐ Novell ☐ Banyan ☐ Peer-To-Peer

**Messaging System**

☐ MHS ☐ CC Mail ☐ MS Mail

**NOTES:**

**LEAD TRACKING**

FormFlow Lead Tracking Model Contact Information Form

(New Record) Field COMPANY Pg 1/2 L

Start FormFlow Form D... Leads Tracki... Microsoft Access 6:57 PM



# Inverse Video, Blinking Cursors, and Font Types

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- Inverse video
- Blinking cursor or fields
- Font types in various styles and sizes

# Using Icons in Screen Design

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- Icons are pictorial, onscreen representations symbolizing computer actions that users may select using a mouse, keyboard, lightpen, touch screen or joystick
- Shapes should be readily recognizable
- Icons for a particular application should be limited to 20 recognizable shapes
- Use icons consistently throughout

# Graphical User Interface (GUI) Controls

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- Text boxes
- Check boxes
- Option or radio buttons
- List and drop-down list boxes
- Sliders and spin buttons
- Image maps
- Text area
- Message boxes

**Figure 12.10** The designer has many GUI components that allow flexibility in designing input screens for the Web or other software packages. This example is from Microsoft Access

The screenshot shows a Microsoft Access window titled "Microsoft Access - [Add Customer Order]". The menu bar includes File, Edit, View, Insert, Format, Records, Tools, Window, and Help. The form itself is titled "Add Customer Order" and shows a date and time of 3/12/01 12:33 PM. The form contains several input fields and controls:

- Customer Number: Text box with value 02122
- Customer Name: Text box with value Carolyn Riter
- Street 1: Text box with value 123 Oak Street
- Apartment: Text box (empty)
- City: Text box with value Arlington
- State: Text box with value MA
- Zip: Text box with value 02174
- Telephone: Text box with value (715) 222-1234
- Country: Dropdown menu with value United States
- Email Address: Text box with value critter@totalmail.com
- High Volume Discount: Check box (checked)
- First Time Purchase: Check box (unchecked)
- Current Balance: Text box with value \$2,123.45
- Credit Limit: Text box with value \$2,000.00
- Payment Type: Dropdown menu with value Corporate Charge
- Customer Type: Radio button group with options: Individual (selected), Federal Government, Corporate Customer, Local or State Government, Non-Profit Organization, and Educational Institution.

At the bottom of the form, there are navigation buttons: a left arrow, a right arrow, a button with a person icon, a button with a plus sign, a button with a floppy disk icon, and a button with a question mark icon. Below these buttons is a button labeled "Add Order Details". The status bar at the bottom indicates "Form View".

# Text Boxes

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- Text boxes should be large enough to accommodate all the characters
- Captions should be to the left of the text box
- Character data is left-aligned within the box
- Numeric data is right-aligned

# Check Boxes

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- Check boxes are used for nonexclusive choices
- Check box text or label is placed to the right of the check box
- If there are more than 10 check boxes, group together in a bordered box

# Option Buttons

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- Option or radio buttons are used for exclusive choices
- Choices are listed to the right of the button, in some sequence
- Often they are placed in a rectangle called an option group
- If more than six option buttons are used, a list box or drop-down list box should be implemented

# List and Drop-Down List Boxes

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- Used when there is little room available on the page
- If there is a commonly selected choice, it is usually displayed in the drop-down list by default

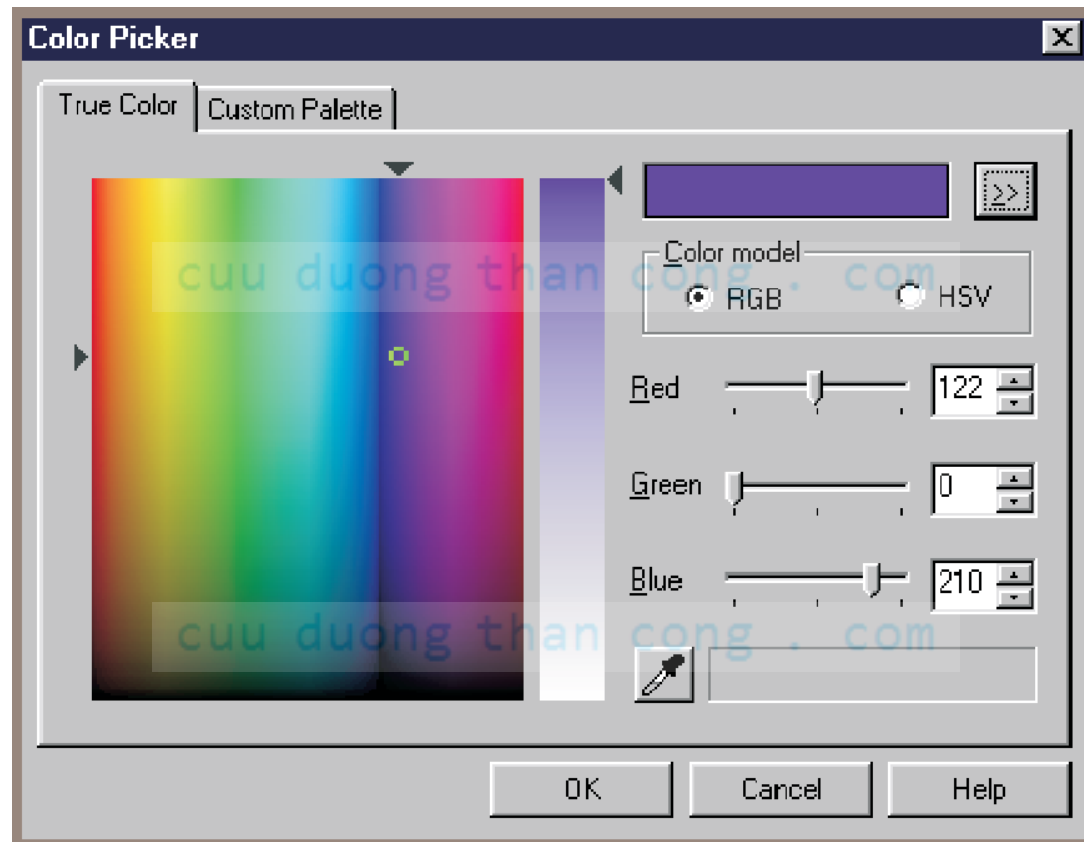


# Sliders, Spin Buttons, and Image Maps

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- Sliders and spin buttons are used to change data that have a continuous range of values
- Image map fields are used to select values within an image

**Figure 21.11** Sliders and spin buttons are two additional GUI components the analyst can use to design input screens



# Text Area

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- A text area is used for entering a larger amount of text
- Can view data larger than the box area
- Handling text:
  - Hard return is used to force new lines
  - Use word wrap within the text area

# Message Boxes and Command Buttons

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- Message boxes are used to warn users and provide feedback messages in a dialog box
- Command buttons perform an action when the user selects it

# Form Controls and Values

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- Each control in a GUI interface stores data associated with the control
- Web pages use a name and value pair that are transmitted to the server or in an email sent along with the form

# Hidden Fields

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- Not visible to the viewer
- Do not take up any space on the Web page
- Can only contain a name and value
- Used to store values sent from one Web form to the server

# Event-Response Charts

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- Used to:
  - list the variety of events that can occur
  - show what should happen
  - build a Web form that requires minimal action from the user
  - explore improvements to the Web page
- Events may be used to:
  - control navigation between Web pages
  - change the contents of drop-down lists

# Dynamic Web Pages

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- Web pages that change themselves as the result of some user action
- Advantage
  - Modify themselves quickly
- Disadvantage
  - Will not work if JavaScript is turned off
  - Dynamic Web pages may not be compliant with the American Disabilities Act



# Ajax

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- Uses JavaScript and XML
- Allows Web developers to build a Web page that works like a traditional desktop program
- The data may be either a small text file or an XML document containing many customers or repeating data
- Has the advantage of making the Web work faster and of providing a smoother viewing experience for users
- The disadvantages are that JavaScript must be enabled and the Web page may violate the American Disabilities Act

# Tab Control Dialogue Boxes

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- Create a separate tab for each unique feature
- Place the most commonly used tabs in front and display them first
- Consider including three basic buttons in your design
  - OK
  - Cancel
  - Help

# Color

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- The five most legible foreground/background color combinations:
  - Black on yellow
  - Green on white
  - Blue on white
  - White on blue
  - Yellow on black

# Intranet and Internet Page Design

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- Provide clear instructions
- Demonstrate a logical entry sequence for fill-in forms
- Use a variety of text boxes, push buttons, radio buttons, drop-down lists, and other GUI features
- Provide a scrolling text box if you are uncertain how much text will be entered

# Intranet and Internet Page Design (Continued)

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- Include two basic buttons: Submit and Clear
- If the form is lengthy, divide it into several simpler forms on separate pages
- Create a feedback screen that lists error messages if a form has not correctly been filled out

# Ecommerce Applications

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- Ecommerce applications involve more than just good designs of Web sites
- Customers need to feel confident in the site
  - Shopping cart

# Summary

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- Guidelines for well-designed input forms:
  - Forms must be easy to fill out
  - Forms must meet the purpose for which they are designed
  - Forms must be designed to ensure accurate completion
  - Forms must be pleasing and attractive

# Summary (Continued)

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- Guidelines for well-designed displays:
  - Displays must be kept simple
  - Displays must be consistent in presentation
  - Design must facilitate movement between pages
  - Displays must be attractive



# Summary (Continued)

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- Guidelines for Web fill-in forms
  - Provide clear instructions
  - Demonstrate a logical entry sequence for fill-in forms
  - Use a variety of text boxes, push buttons, drop-down menus, check boxes, and radio buttons
  - Provide a scrolling text box if you are uncertain about how much space users will need to respond to a question

# Summary (Continued)

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- Guidelines for Web fill-in forms (continued)
  - Prepare two basic buttons on every Web fill-in form: Submit and Clear Form
  - If the form is lengthy and the users must scroll extensively, divide the form into several simpler forms on separate pages
  - Create a feedback screen that highlights errors in an appropriate color and refuses submission of the form until mandatory fields are correctly filled in