



System Analysis and Design

CSE 307

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Lecture 11

Designing Effective Input



Learning Objectives

- Design functional 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, the Web, smartphones, and tablets.



Input Design Objectives

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



Major Topics

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



Good Form Design

- 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

- Form flow
- Seven sections of a form
- Captioning



Form Flow

- 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

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



Caption Types

- 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

Major

(Figure

The diagram illustrates four different form layouts for a registration form, each with a yellow sticky note and an arrow pointing to a specific element:

- Line caption:** Points to the "Last Name" field in the top-right layout.
- Below-line caption:** Points to the "First Name" field in the middle-left layout.
- Boxed caption:** Points to the "Last Name" field in the middle-right layout.
- Vertical checklist:** Points to the "Check off method of travel:" section in the bottom-left layout.
- Horizontal checklist:** Points to the "Check off method of travel:" section in the bottom-right layout.

The form layouts are as follows:

Top-Right Layout:

First Name _____ Last Name _____
Title _____ Telephone () _____

Middle-Left Layout:

First Name _____
Title _____

Middle-Right Layout:

Last Name _____
Telephone _____

Bottom-Left Layout:

First Name _____
Title _____

Bottom-Right Layout:

Last Name _____
Telephone _____

Check off method of travel:

- ☐ Airplane
- ☐ Train
- ☐ Company Car
- ☐ Personal Car

Photo Label _____



Meeting the Intended Purpose

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



Ensuring Accurate Completion

- 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



Keeping Forms Attractive

- 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

- Numerous form design packages are available for desktop systems—there are tools (such as OmniForm by ScanSoft) to set up:
 - Fields
 - Check boxes
 - Lines
 - Boxes

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 (Figure 12.3)

Omniform - [Employment Application]

File Edit View Format Tools Window Help

Proofreader

- Introduction
- Form Image
- Spelling
- Color Adjustment
- Text Formatting
- Object Appearance
- Line Recovery
- Field Names
- Tab Grouping
- Printable Area
- Final Adjustments

Introduction

Select the options in the Proofreader index to make improvements in your form.

You can return to the Proofreader at any time by selecting Proofreader from the Tools menu, or clicking the Proofreader tab in the Tools window.

You then have access to some of the tools in the Proofreader by using the Proofing toolbar.

Winston & Stanley
100 Nathan Lane
Gramercy, NY 14200
1-800-5551212
Are you an opportunity employer?

Winston & Stanley EMPLOYMENT APPLICATION

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

For Help, press F1

Start Omniform FormsDoc Invoice Printing p...

9:50 PM



Controlling Business Forms

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



Good Display and Web Forms Design

- 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

- Heading
- Body
- Comments and instructions



Keeping the Display Consistent

- 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

- 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

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



Using Icons in Screen Design

- 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

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

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 (Figure 12.4)

The screenshot shows a Microsoft Access window titled "Microsoft Access - [Customer]". The menu bar includes File, Edit, View, Insert, Format, Records, Tools, Window, Help, and Adobe PDF. A search bar on the right says "Type a question for help". The main form is titled "Add Customer Order" and displays the date "6/3/2010" and time "1:02 PM".

The form contains the following fields and controls:

- Customer Number: 02122
- Customer Name: Carolyn Riter
- Street: 2885 N. Washington
- Apartment: P.O. BOX 9200
- City: Arlington
- State: WI
- Zip: 53704
- Telephone: (715) 222-1234
- Country: United States
- Email Address: critter7@hotmail.com
- Current Balance: \$6,780.00
- Credit Limit: \$320,000.00
- Payment Type: Corporate Charge (dropdown menu)
- High Volume Discount: ☒
- First Time Purchase: ☒
- Customer Type (radio buttons):
 - ☒ Individual
 - ☐ Corporate Customer
 - ☐ Non-Profit Organization
 - ☐ Federal Government
 - ☐ Local or State Government
 - ☐ Educational Institution

Navigation buttons at the bottom include: Back, Forward, Find, Add New, Print, and a button labeled "Add Order Details". The status bar at the bottom indicates "Form View".



Text Boxes

- 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



HTML5 Browsers Features

- Placeholder puts a small amount of help text into a text box, displaying in a lighter color
- When the cursor is placed in the field the text vanishes
- New text boxes:
 - Email
 - Telephone
 - URL, a Web address



HTML5 Browsers Features

- These appear as normal text boxes on a computer
- When used on a tablet or smartphone, they can be used to customize the pop-up keyboard
 - Telephone number, the keyboard layout changes to a number pad
 - A URL, the keyboard includes a .com button
 - An email address, the keyboard includes an @ symbol
- Helps the user enter data quickly and accurately



HTML5 Browsers Features

- A datalist displays a drop-down list of predefined suggestions to make entry easier for the user
- As the user begins to type the first few letters, the datalist is displayed
- The user can choose one of the items in the list to make a selection
- This is used in the autocomplete function



HTML5 Browsers Features

- A calendar control to select a date, a date and time, or a local date and time
- Selecting dates from a pop-up calendar is easier and less error-prone than entering text



Check Boxes

- 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 ten check boxes, group together in a bordered box



Option Buttons

- 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

- 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



Tab Control Dialogue Boxes

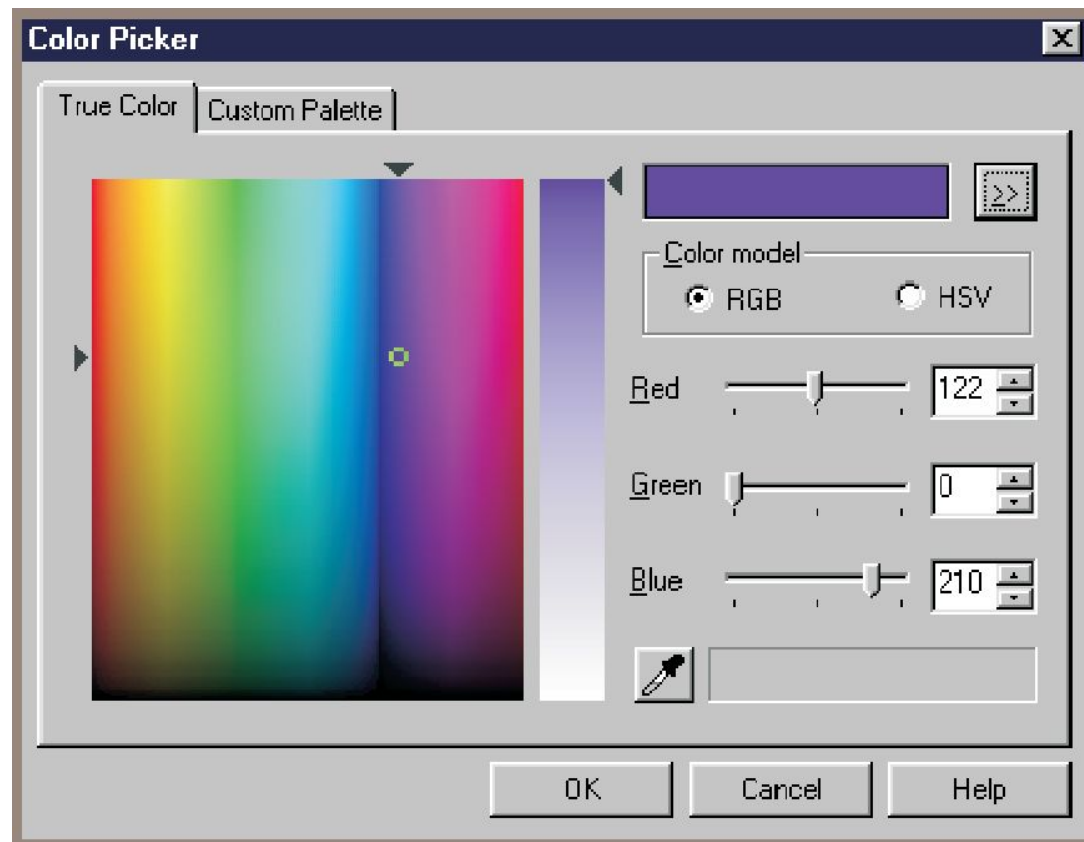
- Create a separate tab for each unique feature
- Place the most commonly used tabs in front and display them first
- Consider including three basic buttons in your design:
 - OK
 - Cancel
 - Help



Sliders, Spin Buttons, and Image Maps

- 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

Sliders and Spin Buttons Are Two GUI Components the Analyst Can Use to Design Input Screens (Figure 12.5)





Text Area

- 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

- Message boxes are used to warn users and provide feedback messages in a dialog box
- Command buttons (Calculate Total, Add Order, OK) perform an action when the user selects it



Form Controls and Values

- 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

- 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

- 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
- Note: Events may be clicking a button, changing a value, the field receives focus, blurring a field, loading the web page, detecting keystrokes and so on.



Dynamic Web Pages

- 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



Three Dimensional Web Pages

- Use stacked layers
- Code is moved in front of the web page
- Code may be created using JavaScript
- Analyst must determine when to use layers



Three Dimensional Web Pages

- Analyst must determine:
 - How is the layer built?
 - What events cause the layer to be created?
 - What events remove the layer?
 - Where should the block be placed?
 - The size of the block?
 - How to frame the region?
 - What happens when an option is selected?

Ajax (Asynchronous JavaScript and XML)

- 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



Color

- Color allows you to:
 - Contrast foreground and background
 - Highlight important fields
 - Feature errors
 - Highlight special code input
 - Call attention to other special attributes



Color

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



Website Page Design

- 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



Website Page Design (continued)

- 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

- Ecommerce applications involve more than just good designs of websites.
- Customers need to feel confident in the site
 - Shopping cart
 - Customer can edit the quantity of the item ordered or can remove the item entirely



Summary

- 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)

- 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)

- 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)

- 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



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