# Interface Design

ISYS 184

## Overview

- Information systems interact with people and other systems
- Poorly designed user interface can make the information system unusable
- Poorly designed system interfaces are a source of errors and inefficiency
- User and system interfaces involve both inputs and outputs and involve a large number of stakeholders

# User Interfaces and System Interfaces

- User Interface – inputs and outputs that directly involve a human user/actor
  - A dialog goes on between actor and system
- System Interface – the inputs and outputs that require minimal human intervention
  - Inputs captured automatically
  - Outputs direct to other systems
  - Printed and distributed outputs (statements, reports)

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# User Centered Design

- Design techniques that embody the view that the user interface is the system to the user
- Dates back to the 1980s (more for Mac)
- Principles of User Centered Design
  - Focus early on users and their work
  - Evaluate designs to ensure usability
  - Use iterative development
- Note that contemporary A&D finally incorporates these principles

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## 5 Principles of User-Centered Design

1. Understand your users and support their goals
2. Make your interface easy to learn and enjoyable to use
3. Remain consistent
4. Form a dialog with your users
5. Be problem free

## Three Components of the User Interface




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# Metaphors of Human Computer Interaction

- Direct manipulation metaphor
  - metaphor in which objects on a display are manipulated to look like physical objects (pictures) or graphic symbols that represent them (icons)
- Desktop metaphor
  - metaphor in which the visual display is organized into distinct regions, with a large empty workspace in the middle and a collection of tool icons around the perimeter
- Document metaphor
  - metaphor in which data is visually represented as paper pages or forms
- Dialog metaphor
  - metaphor in which user and computer accomplish a task by engaging in a conversation or dialog via text, voice, or tools such as labeled buttons

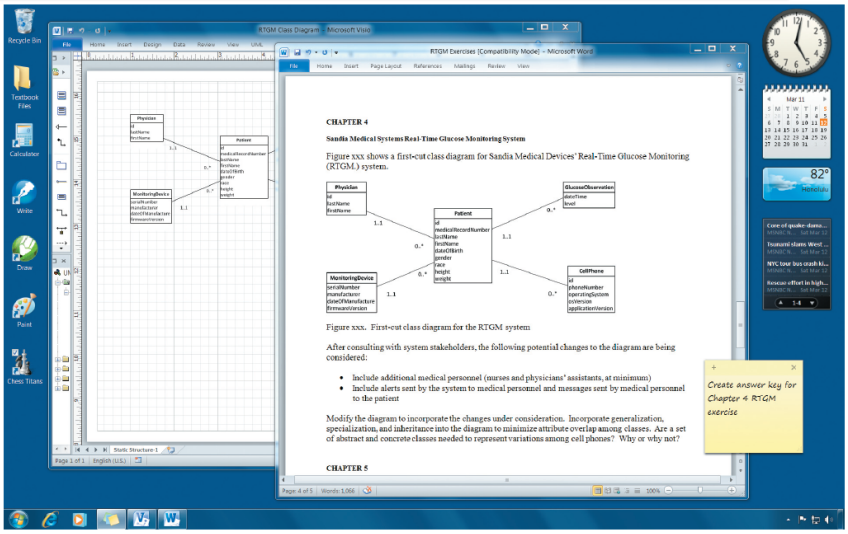
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# Metaphor Details

| Metaphor | Description | Example |
|---|---|---|
| Direct manipulation | Manipulating objects on a display that look like physical objects (pictures) or that represent them (icons) | The user drags a folder icon to an image of a recycle bin or trash can to delete a collection of files. |
| Desktop | Organizing visual display into distinct regions, with a large empty workspace in the middle and a collection of tool icons around the perimeter | At computer startup, a Windows user sees a desktop, with icons for a clock, calendar, notepad, inbox and sticky notes (the computer interface version of a physical Post-It note). |
| Document | Visually representing the data in files as paper pages or forms. These pages can be linked together by references (hyperlinks) | The user fills in a form field for a product he or she owns, and the manufacturer's Web site finds and displays the product's manual as an Adobe Acrobat file, which contains a hyperlinked table of contents and embedded links to related documents. |
| Dialog | The user and computer accomplishing a task by engaging in a conversation or dialog by using text, voice, or tools, such as labeled buttons | The user clicks a button labeled "troubleshoot" because the printer isn't working. The computer prints questions on the display, and the user responds by typing answers or selecting responses from a printed list. |

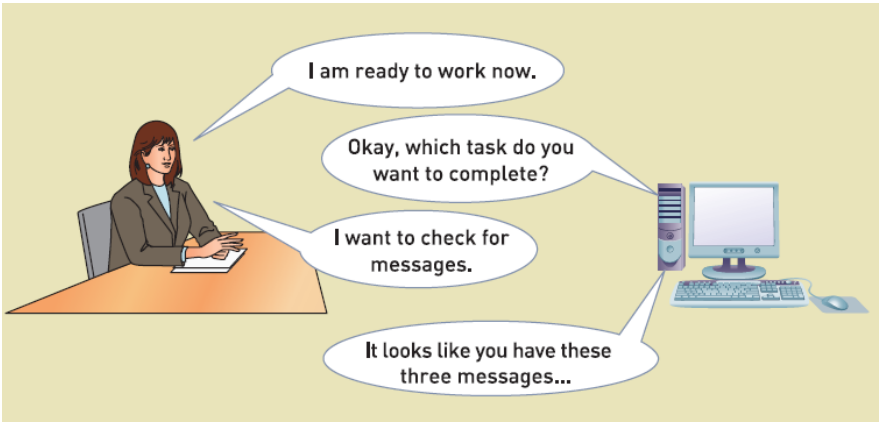
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# Direct Manipulation, Desktop, and Document Metaphors On One Screen




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# Dialog Metaphor




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## User Interface Design Concepts

- Human-Computer Interaction (HCI)
  - A field of study concerned with the efficiency and effectiveness of user interaction with computer systems, human-oriented input and output technology, and psychological aspects of user interfaces
- Visibility and Affordance
  - To be usable, a control must be visible to the user and its appearance should suggest its functionality
    - Media player controls, buttons, scroll bars

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## User Interface Design Guidelines

- Design for Consistency
- Provide Shortcuts
- Provide Feedback
- Dialogs Should Yield Closure
- Error Handling that Provides Guidance
- Easy Reversal of Actions
- Reduce Short Term Memory Load

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# Use Cases and the Menu Hierarchy

- We design use case by use case
- Menus are a typical way to organize access to use case functionality
- Different types of users might have different menus
- Useful to design an overall menu hierarchy and then subsets for different users
- Once the hierarchy is established, menus can be implemented in a variety of ways

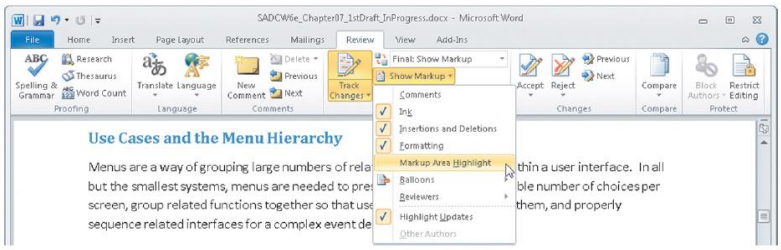
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# Two Different Menu Styles

(a)




(b)



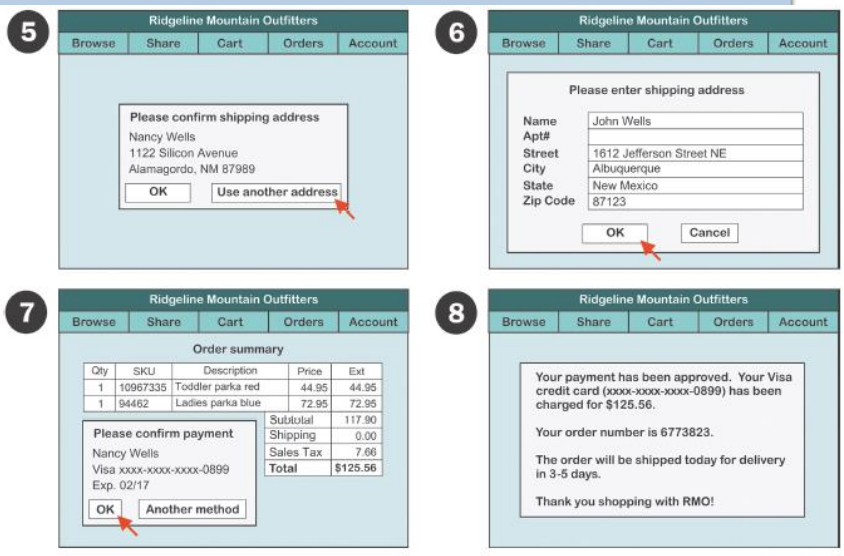

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# From Dialog to Storyboard (part 2)

| | |
|---|---|
| USER: | Free UPS ground shipping. |
| SYSTEM: | We have a shipping address on file for you (1122 Silicon Avenue). Do you want your order shipped to that address? |
| USER: | No. |
| SYSTEM: | To what address would you like the order shipped? |
| USER: | John Wells, 1612 Jefferson Street NE, Albuquerque, NM 87123. |
| SYSTEM: | Okay, the total charge is $125.56 ($117.90 item subtotal plus $7.66 sales tax). Shall I charge that amount to your credit card on file (a Visa with an account number ending in 0899)? |
| USER: | Yes. |
| SYSTEM: | Your payment has been approved, and your order is being prepared for shipment. A confirmation e-mail has been sent to you, and another will be sent with a shipment tracking number when the order is shipped later today. Can I help you with anything else? |
| USER: | No. |

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# From Dialog to Storyboard (part 2)




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## Guidelines for Windows and Forms

- Interface Layout and Formatting
  - Consistency, labels and headings, distribution and order, fonts and colors
- Data Entry
  - Text box, list box, combo box, radio buttons, check boxes
- Navigation and Support Controls
  - Minimize, maximize, close, scroll bars, resize

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## Guidelines for Web Browser User Interfaces

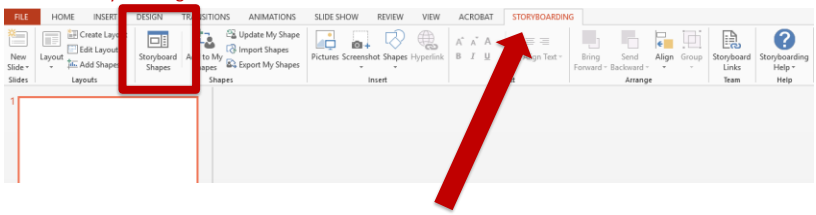
- Consistency
  - Cascading Style Sheets (CSS) – Web page encoding standard that enables a Web site designer to specify parts of a page that will always look the same and parts that will vary by task or audience
- Performance Considerations
  - Sensitive to network connection, amount of information transmitted, type of information transmitted
- Pictures, Video, and Sound
  - Powerful, but compatibility issues arise
- Users with Disabilities
  - Assistive technologies -- software (such as text-to-speech and voice-recognition utilities) that adapts user interfaces to the special needs of persons with disabilities

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# Storyboarding in MS PowerPoint

Microsoft PowerPoint has a set of tools called Storyboarding that allows users to develop storyboards for websites, mobile apps, etc. The set of tools contains backgrounds, icons, controls, etc. that would typically be used, and they are customizable directly in PowerPoint.

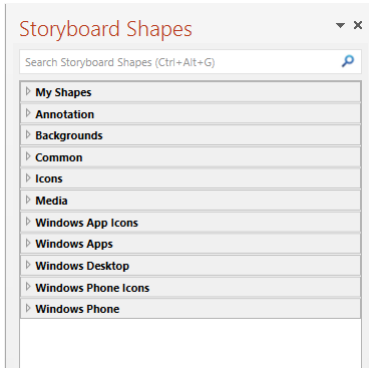
To see the available tools, click the Storyboard Shapes button under the Storyboarding tab.



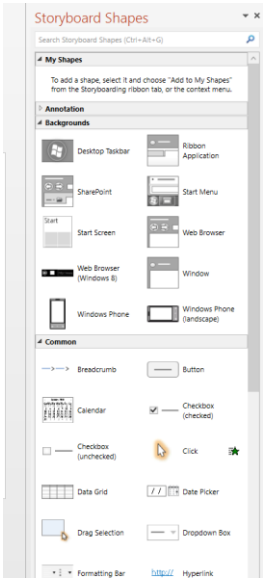

Storyboarding tab in MS PowerPoint.

If you do not have this tab, you need to install the TFS Office Integration Installer located at: https://go.microsoft.com/fwlink/?LinkId=691127

# Storyboard Shapes

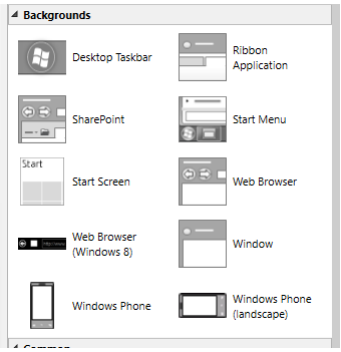



The Storyboard Shapes is categorized to show useful controls for different types of storyboards. Click the triangle to the left of each category to show the shapes.



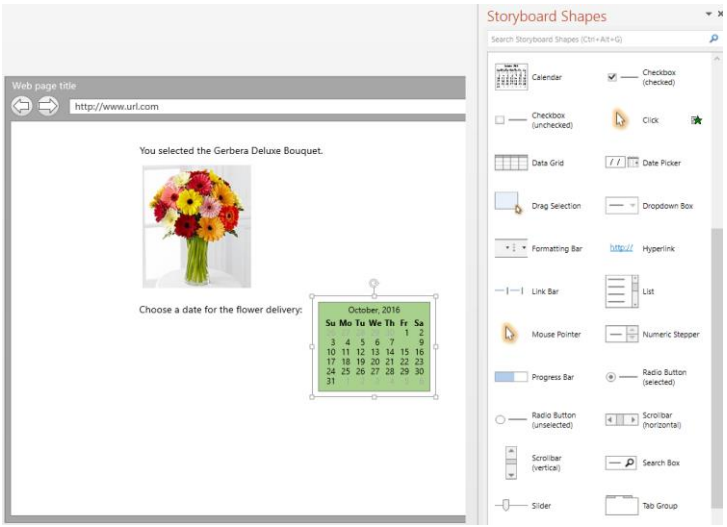

Drag shapes from the Storyboard Shapes onto the slide to create a storyboard.

## Choose a background depending on your interface




## Customize the Storyboard

Once shapes are dragged onto the slide, they can be customized and additional graphics can be incorporated as needed.



## Shapes are used for specific types of user interaction

**Check Box**




Checkboxes present the user with a yes or no choice, which the user can select as YES by checking the checkbox.

**Dropdown Box**




A dropdown box allows the user to choose a value from a list.

**Radio Button**



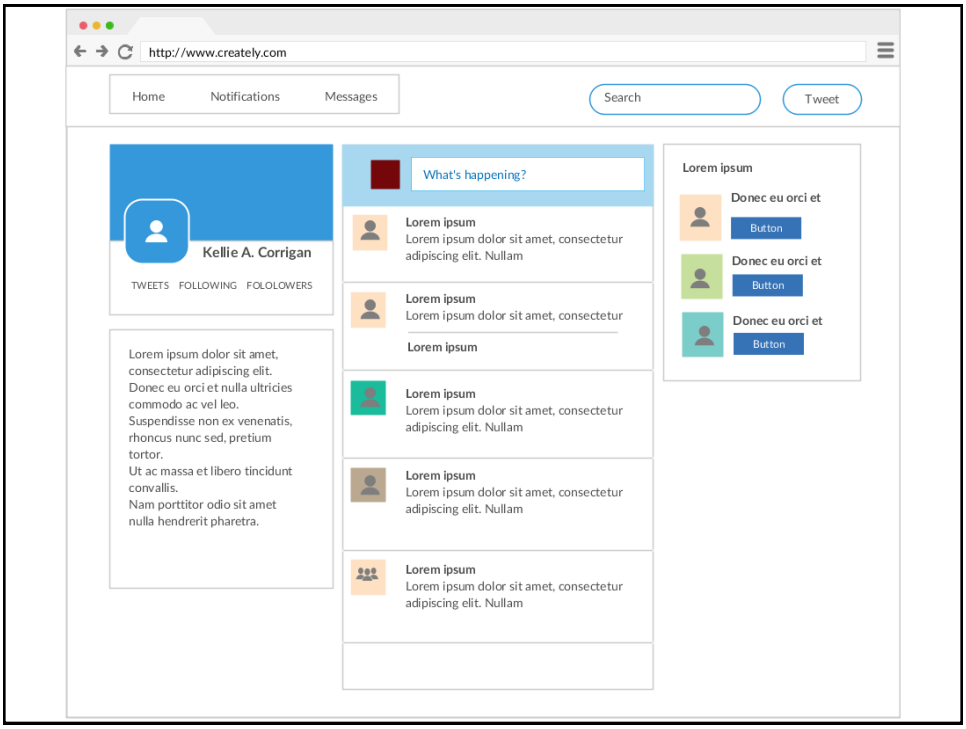

Radio buttons present the user with a bunch of choices, and allow the user to pick one.

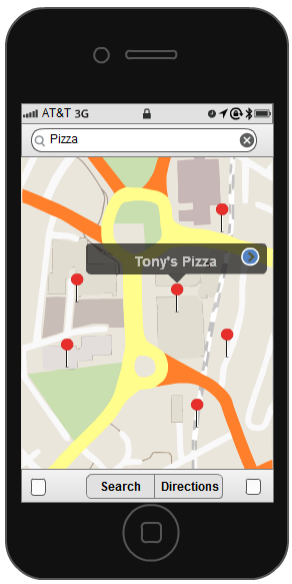
**Search Box**




A search box allows a user to search for information that may be somewhere in the website. If it is, then links to that relevant information will appear.

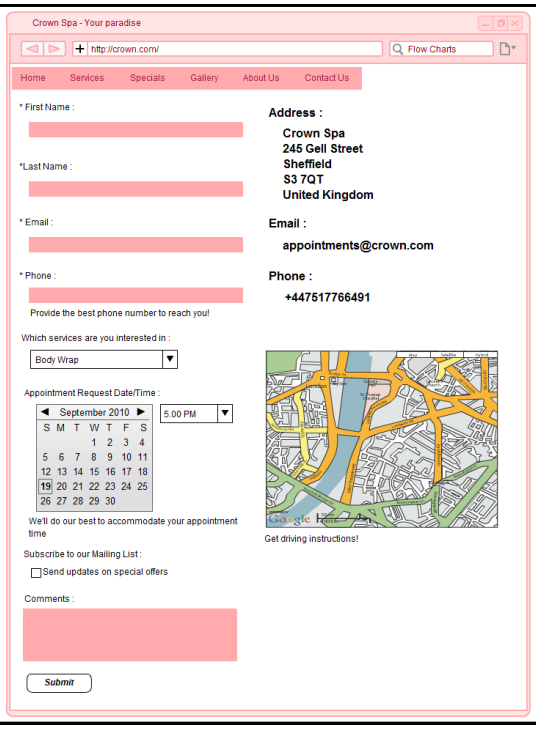
## Sample User Interfaces

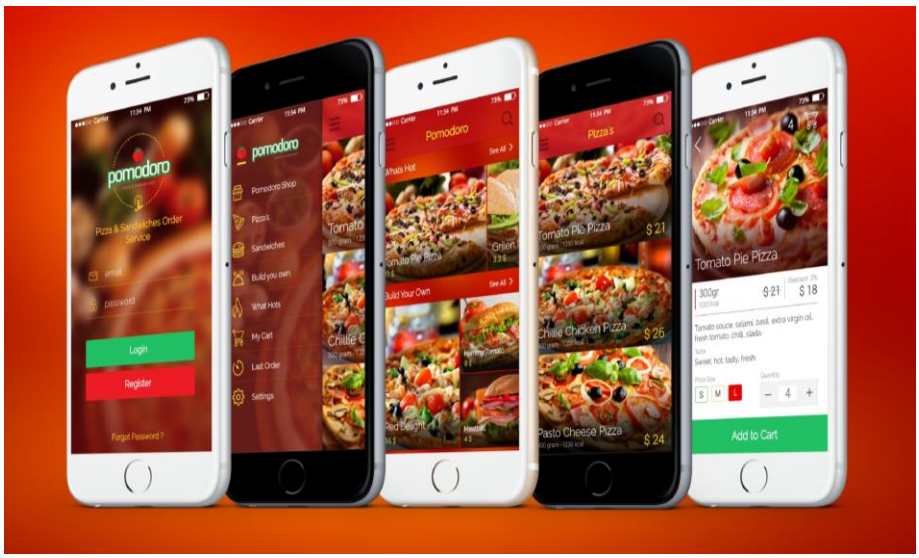

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Tony's Pizza
Search
Directions


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OVERVIEW
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SEARCH
PERSONAL REMINDERS
WEEKLY ACTIVITY
MON TUES WED THU FRI SAT SUN
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COMPLETE
08 JUN DESIGN DEADLINE
12 JUN MEETING JOHN DAILY
19 JUN CONFERENCE CALL
24 JUN RESPONSIVE WEBSITE
EATING PLAN
DAILY PLANNER
REMINDERS
MEETINGS
SHOPPING LISTS
TO-DO LISTS
DASHBOARD
Overview


EMC Global Labs-as-a-Service - Reservations
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Channel EMC
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Reports
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Search...
My Reservations
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Equipment Name
Model
Version
Start Date
End Date
Purpose
Status
344 Celerra-Kratos-1 NS-480 7.0.24.0 11/10/2011 12/12/2011 CBFS API testing Pending
321 Celerra-Thalassa-2 V-G2 7.0.12-0 11/10/2011 12/12/2011 Client demo Approved
212 eng543124 SR1600UR RHEL 5 x86_64 11/10/2011 12/12/2011 bug fix testing Expired
98 JAC00092600070 8.0 Drive Bay 11/10/2011 12/12/2011 CBFS API testing Approved
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Provide the best phone number to reach you!
Which services are you interested in :
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# Cool example of the design process

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