System Analysis and Design

CSE 307

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Lecture 10

Designing Effective Output

Learning Objectives

- Understand the objectives for effective output design
- Relate output content to output methods inside and outside the organizational context
- Realize how output bias affects users
- Design display output
- Design dashboard, widgets, and gadgets
- Design a websites for ecommerce and corporate uses that include Web 2.0 technologies
- Understand the development process for apps used on smartphones and tablets

Output

- Information delivered to users
- Output forms
  - Hard-copy—printed reports
  - Soft-copy—computer screens, microforms, and audio
- To create output, the analyst works interactively with the user until the output is satisfactory

Major Topics

- Designing output
- Output technologies
- Factors in choosing an output technology
- Report design
- Screen design
- Website design
- Smartphones and tablet design

Output Design Objectives

- Serve a specific user or organizational purpose
- Meaningful to the user
- Deliver the appropriate quantity of output
- Make sure the output is where it is needed
- Provide output on time
- Choosing the most effective output method

Relating Output Content to Method

- Content of output must be considered as interrelated to the output method
  - External—going outside the business
  - Internal—staying within the business

External Output

- Examples:
  - Utility bills
  - Advertisements
  - Paychecks
- Differs from internal output in:
  - Distribution
  - Design
  - Appearance

Internal Output

- Examples:
  - Summary reports
  - Detailed reports
  - Historical reports
  - Exception reports
- Might consist of material available on an intranet

A Comparison of Output Methods
(Figure 11.2)

Output Method	Advantages
Printer	• Affordable for most organizations • Flexible in types of output, location, capabilities • Handles large volumes of output • Highly reliable with little down time
Display screen	• Interactive • Online, real-time transmission • Quiet • Takes advantage of computer capab

A Comparison of Output Methods

(Figure 11.2) (continued)

• Good for individual user • Good for transient messages • Good where worker needs hands free • Good if output needs to be widely distributed	• Needs earbuds where output will interf with other tasks • Has limited application
• Highly portable • Very interactive using gestures • Zoom is possible	• Screen may be too small for text • Icons and buttons may be confusing • May be lost more easily
• Reduces paper • Can be updated very easily • Can be "broadcast" • Can be made interactive	• Is not conducive to formatting (email) • Is difficult to convey context of messa • Web sites need diligent maintenance

Factors to Consider When Choosing Output Technology

- Who will use the output?
- How many people need the output?
- Where is the output needed?
- What is the purpose?
- What is the speed with which output is needed?
- How frequently will the output be accessed?
- How long will the output be stored?
- Regulations depicting output produced, stored, and distributed
- Initial and ongoing costs of maintenance and supplies
- Human and environmental requirements

Green IT Initiatives

- May limit the quantity of paper reports that are printed
- May discourage employees from printing out copies of email messages by adding a green IT notification to the bottom of each corporate email message

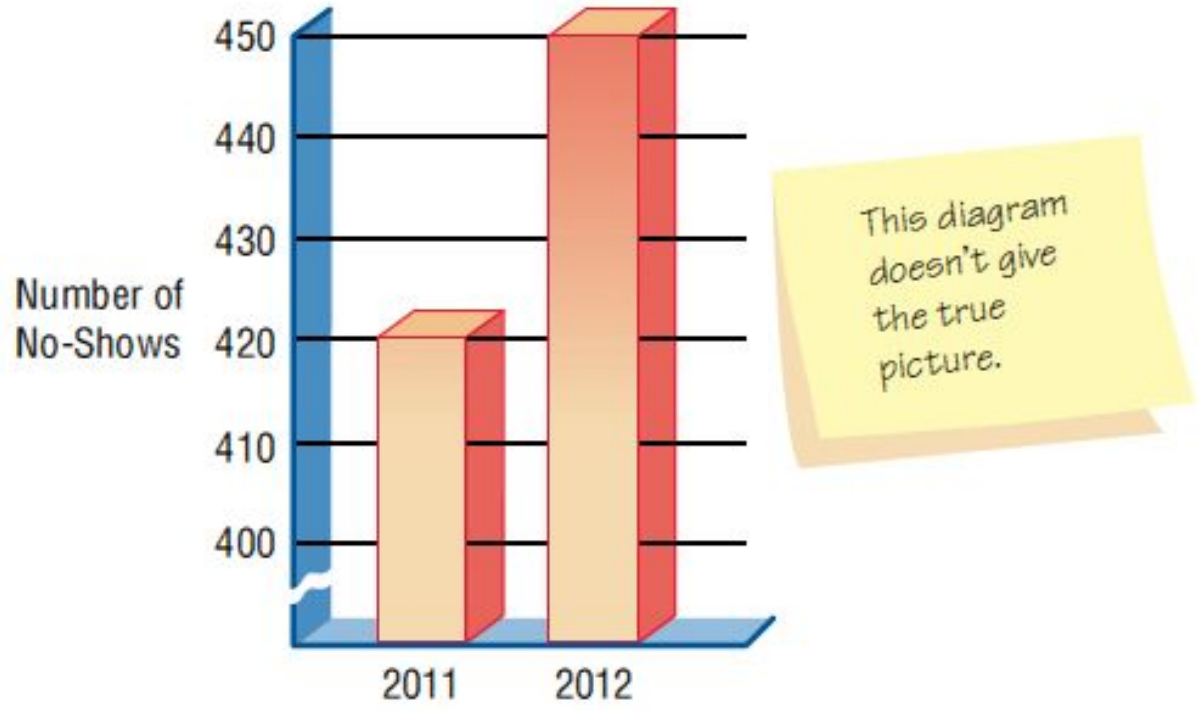
Output Bias

- Analysts must avoid unnecessarily biasing output and make users aware of the possible biases in output
- Bias is introduced in three main ways:
  - How information is sorted
  - Setting of acceptable limits
  - Choice of graphics

Avoiding Bias in the Design Output

- Be aware of the sources of bias
- Design of output that includes users
- Work with users so that they are informed of the output's biases
- Creating output that is flexible and allows users to modify limits and ranges
- Train users to rely on multiple output for conducting "reality tests" on system output

A Misleading Graph Will Most Likely Bias the User (Figure 11.5)



Designing Printed Output

- Detailed reports
  - Print a report line for every record on the master file
- Exception reports
  - Print a line for all records that match a certain condition
- Summary reports
  - Print one line for a group of records that are used to make decisions

Designing Output for Displays

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

Graphical Output in Screen Design

- The purpose of the graph
- The kind of data to be displayed
- The audience
- The effects on the audience of different kinds of graphical output

Dashboards

- Make sure the data has context
- Display the proper amount of summarization and precision
- Choose appropriate performance measures for display
- Present data fairly

Dashboards (continued)

- Choose the correct style of graph or chart for display
- Use well-designed display media
- Limit the variety of item types
- Highlight important data

Dashboards (continued)

- Highlight important data
- Arrange the data in meaningful groups
- Keep the screen uncluttered
- Keep the entire dashboard on a single screen
- Allow flexibility

Widgets and Gadgets

- Can be any type of a program that may be useful to any person interacting with a computer
- Can empower users to take part in design of their own desktop

Designing a Website

- Use professional tools
- Study other sites
- Use Web resources
- Examine the sites of professional website designers
- Use the tools you've learned
- Use storyboarding, wireframing, and mockups

Designing a Website (continued)

- Consult the books
- Examine poorly designed websites
- Creating Web templates
  - Style sheets allow you to format all Web pages in a site consistently
- Using plug-ins, audio, and video sparingly

Storyboarding

- In developing a website or app a storyboard could be used to show the differences between screens
- It can show how a visitor to the site would navigate the website

Wireframing

- Page design can be accomplished using a process called wireframing
- Wireframing because it shows only the basics
- There is no color, no type style; graphics are shown as a simple box with an X drawn in
- In this way, each of the items acts as a placeholder

Wireframing

- Wireframing allows the designer to plan:
  - The overall design, showing what element appears at each position on the page
  - The navigational design, showing how to move from one page to the next using buttons, tabs, links, and pull-down menus
  - The interface design, showing how to interact with the website by inputting data or responding to questions

Mockups

- The term *wireframe* has largely been replaced with mockup
- Mockups show what the output and input will look like
- Abundant software is available to help a systems designer develop a mockup

Mockups

- The software has objects that can be dragged and dropped onto the screen
- Templates are available for any type of display including:
  - Desktops
  - Notebooks
  - Smartphones
  - Tablets
- When designing for smartphones and tablets, both screen orientations are included

Designing a Website (continued)

- Plan ahead, pay attention to:
  - Structure
  - Content
  - Text
  - Graphics
  - Presentations style
  - Navigation
  - Promotion

Structure

- One of the most important steps in developing a professional website
- Each page in the Web structure should have a distinct message
- Can benefit from using website diagramming and mapping tools

Content

- Appropriate content is needed to keep the user interested
- Use a metaphor or images that provide metaphor for your site
- Should include a FAQ page
- May take advantage of prewritten software

Text

- Each Web page should have a title
- Place meaningful words in the first sentence appearing on your Web page
- Clear writing is important

Content Management Systems

- Content on ecommerce sites needs to be constantly updated
- Content management systems (CMSs) are software tools that help to develop and maintain websites and online applications

Graphics

- Use either JPEG, GIF, or PNG formats
- Keep the background simple and readable
- Create a few professional-looking graphics for use on your pages
- Keep images small and reuse bullet or navigational buttons
- Include text in what is called a Title or ALT attribute for images and image hot spots
- Examine your website on a variety of displays and screen resolutions

Presentation Style

- Provide a home page
- Keep the number of graphics to a reasonable minimum
- Use large and colorful fonts for headings
- Use interesting images and buttons for links
- Use CSS to control the formatting and layout of the Web page

Presentation Style (continued)

- Use divisions and cascading styles or tables to enhance a layout
- Use the same graphics image on several Web pages
- Use Javascript to enhance Web page layout
- Avoid overusing animation, sound, and other elements

Navigation

- The three-clicks rule
- Promote the website
- Include a navigation bar and links to the home page on every page on the website

Promotion

- Promote your site
- Submit often to search engines
- Include key words in metatags
- Encourage your readers to bookmark your website

Web 2.0 Technologies and Social Media Design

- It is important to include Web 2.0 technologies that focus on enabling and facilitating user-generated content and collaboration
- Types of technologies you should think about including:
  - Blogs
  - Wikis
  - Links to social networks on which the company has a presence
  - Tagging

Tagging

- Tagging or social bookmarking provides useful pointers to online resources such as:
  - Websites
  - content on corporate intranets
  - Corporate documents, or photos that are relevant to the organization and to users

Reasons for Using Collaborative Tools

- Companies use collaborative tools to:
  - Communicate an integrated branding and messaging strategy across multiple platforms
  - To gauge consumer opinion
  - To gather feedback
  - To create a community of users

Internal Use of Social Media

- Inward-facing Web technologies can be useful in:
  - Building employee relationships
  - Maintaining trust
  - Sharing knowledge
  - Innovating among employees and groups of employees
  - Locating corporate resources more readily
  - Nurturing corporate culture and subcultures inside the organization

Five Aspects an Analyst Should Consider

1. Realize differences between corporate objectives and objectives of key stakeholders
2. Serve as the voice of the customer to your client organization
3. Recognize the importance of visual page design for effectively displaying collaborative tools
4. Revise and update the Web 2.0 technologies offered frequently
5. Work to integrate Web 2.0 technologies with the existing branding

Designing for Smartphones and Tablets

1. Set up a developer account
2. Choose a development process
3. Be an original
4. Determine how you will price the app

Designing for Smartphones and Tablets

5. Follow the rules for output design
6. Design your icon
7. Choose an appropriate name for the app
8. Design for a variety of devices
9. Design the output for the app

Designing for Smartphones and Tablets

10. Design the output a second time for different orientation
11. Design the logic
12. Create the user interface using gestures
13. Protect your property
14. Market your app

Choose a Development Process

- Prototyping is most likely the best way to develop your app
- Quick releases are important
- Quality should not be sacrificed, but you can introduce an app and then add features later
- Advantages of introducing an app first:
  - It allows you to gain an advantage
  - Revise the app adding new features
  - Increases visibility because the app appears on a list of apps that have been updated

Determine Pricing the App

- There are six basic options for pricing:
  1. Choose a low-cost strategy
  2. Introduce an app as a “premium” app
  3. Adopt a “freemium” model
  4. Offer an app for free
  5. Promote an app by reducing its price
  6. Accept advertising

Design the App's Logic

- Tablets and smartphones fit in well with the prototyping method of development
- Sometimes the best way is to sketch out the logic using structured decision making techniques

Create the User Interface Using Gestures

- Smartphones and tablets have innovative user interfaces
- Technically called touchscreen capacitive sensing
- Design apps assuming that users will demand touch-sensitive interfaces
- Use gestures such as:
  - Swipes
  - Pinches
  - Tugs
  - Shakes

Market Your App

- Need to convince a person to pay for and download your app
- To market your app, you will need:
  - A large icon
  - A description
  - A section explaining what is new in the current version
  - A sample set of screen shots

Output Production and XML

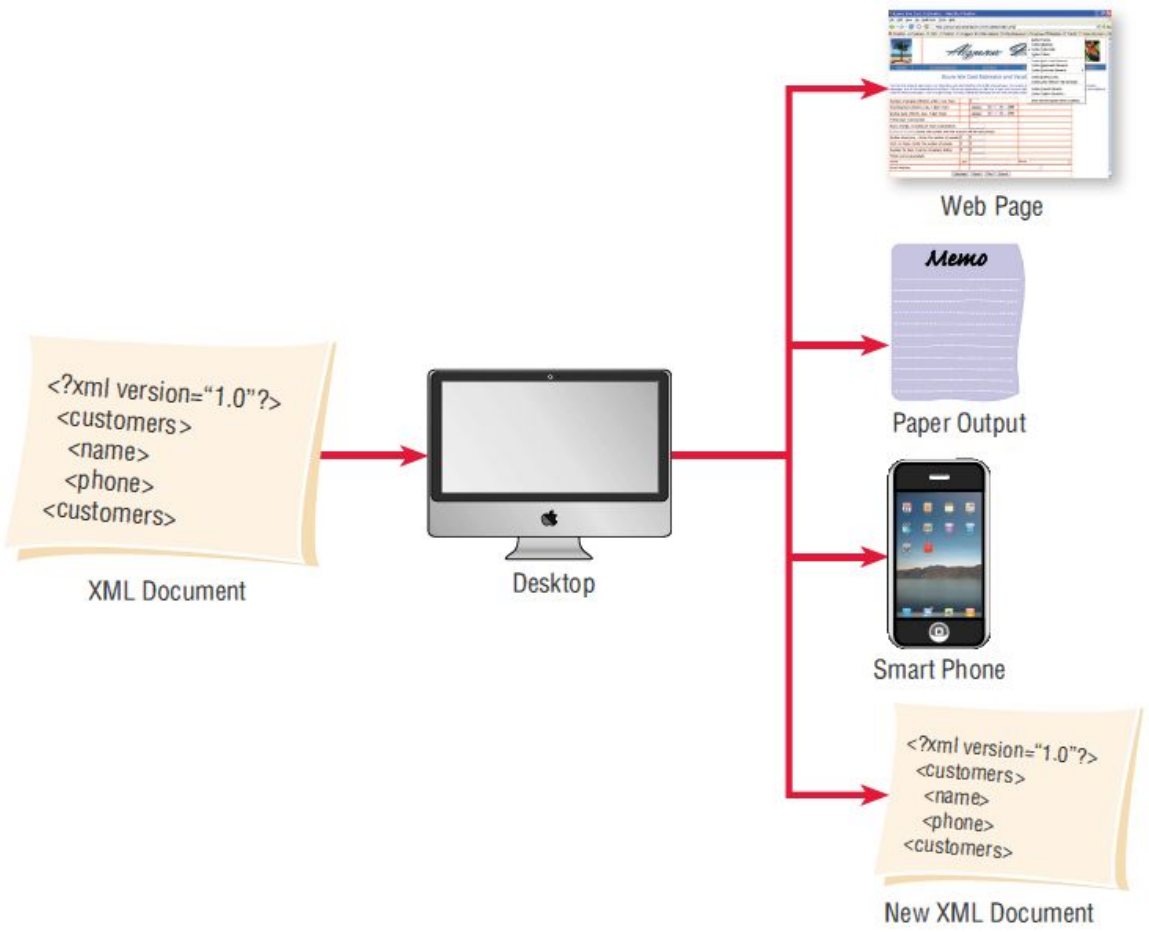
- An XML document may be transformed into different output media types
- Methods:
  - Extensible Style Language Transformations (XSLT)
  - Ajax
  - Cascading style sheets (CSS)

Extensible Style Language Transformations (XSLT)

XSLT allows you to:

- Select XML elements
- Sort sequence
- Selection of data

Extensible Style Language Transformation (XSLT) Can Transform XML Documents into Many Different Formats (Figure 11.20)



Ajax

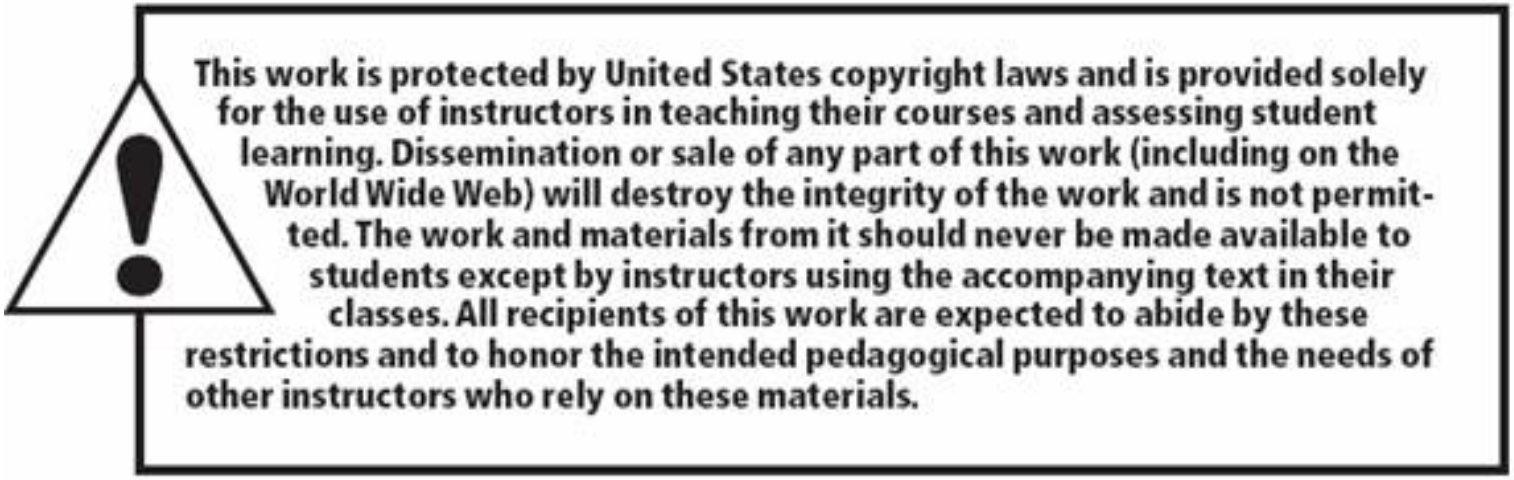
- Uses both JavaScript and XML to obtain small amounts of data from a server without leaving the webpage
- The user does not have to wait for a new webpage to display after making a selection

Summary

- Output
- Output design objectives
- Output content
- Output technologies
- Presentation of output

Summary

- Display output
- Web design
- Social media
- Smart phone and tablet design
- XML transformation



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Lecture 10