Designing Effective Output

Systems Analysis and Design, 7e
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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 tabular and graphic output for users interacting with decision support systems
• Design a Web site for ecommerce
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
• Web site 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 right 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
Output Technologies

- Printers
- Display screen
- Audio output and Podcasts
- DVD, CD-ROM and CD-RW
- Electronic output
Printers

• The trend in printers is toward increased flexibility

• Key factors of printers:
  • Reliability
  • Compatibility with software and hardware
  • Manufacturing support
Display Screen

• Advantages:
  • Result in cost savings
  • May be desirable from the user’s standpoint
  • Easier to keep up to date

• Disadvantages:
  • Different screen resolutions
  • Fonts
Video, Audio, and Animation

- **Video**
  - Combines the impact of audio with a visual channel

- **Audio**
  - Transient, usually output for the benefit of one user

- **Animation**
  - The presentation of different images in a series, one at a time
Video Clips

- Supplementing static, printed output
- Distance collaboration
- Showing how to perform an action
- Providing brief training episodes
- Shifting the time of an actual event by recording it for later output
- Preserving an important occasion
Audio

• Sound
  • Music
  • Sound effects
• Telephone
• Podcasting
  • Technique of putting downloadable voice files on the Web as RSS files
Animation

- Animation is composed of four elements:
  - Elemental symbols
  - Spatial orientation
  - Transition effects
  - Alteration effects
CD-ROMs and DVDs

- Less vulnerable to damage from human handling
- Can include full-color text and graphics as well as audio and video
Electronic Output

- Electronic mail (email)
- Faxes
- Bulletin board messages
RSS (Really Simple Syndication)

- A way of gathering and distributing news and other content from multiple sources
- RSS news readers can either stand alone or be integrated with your browser as plug-ins
- Has the advantage of efficiently organizing news and other information from a variety of sources chosen by the user
Push and Pull Technology

- Pull technology allows the user to take formatted data from the Web
- Push technology sends solicited or unsolicited information to a customer or client
**Figure 11.2 A comparison of output methods**

<table>
<thead>
<tr>
<th>Output Method</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printer</td>
<td>• Affordable for most organizations • Flexible in types of output, location, and capabilities • Handles large volumes of output • Highly reliable with little down time</td>
<td>• Still requires some operator intervention • Compatibility problems with computer software • May require special, expensive supplies • Depending on model, may be slow • Environmentally unfriendly</td>
</tr>
<tr>
<td>Display screen</td>
<td>• Interactive • Online, real-time transmission • Quiet • Takes advantage of computer capabilities for movement within databases and files • Good for frequently accessed, ephemeral messages</td>
<td>• May require cabling and setup space • Still may require printed documentation</td>
</tr>
<tr>
<td>Audio output and podcasts</td>
<td>• Good for individual user • Good for transient messages • Good where worker needs hands free • Good if output needs to be widely distributed</td>
<td>• Is expensive to develop • Needs earbuds where output will not interfere with other tasks • Has limited application</td>
</tr>
<tr>
<td>DVD, CD-ROM, and CD-RW</td>
<td>• Has large capacity • Allows multimedia output</td>
<td>• Requires a computer for reading data</td>
</tr>
<tr>
<td>Electronic output (email, Web sites, blogs, and RSS feeds)</td>
<td>• Reduces paper • Can be updated very easily • Can be “broadcast” • Can be made interactive</td>
<td>• Is not conducive to formatting (email) • Is difficult to convey context of messages (email) • Web sites need diligent maintenance</td>
</tr>
</tbody>
</table>
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
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
- Working 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
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 and are used to make decisions
Report Design Conventions

- Constant information remains the same whenever the report is printed.
- Variable information can vary each time the report is printed.
- Paper quality, type, and size.
Designing Printed Reports

- Functional attributes
- Stylistic and aesthetic considerations
- Well organized
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 content
- Display the proper amount of summarization and precision
- Choose appropriate performance measures for display
- Present data fairly
- Choose the correct style of graph or chart for display
- Use well-designed display media
- Limit the variety of item types
- 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 Web Site

• Use professional tools
• Studying other sites
• Use Web resources
• Examine the sites of professional Web site designers
• Use the tools you’ve learned
• Consult the books
• Examine poorly designed Web pages
Designing a Web Site (Continued)

- Creating Web templates
  - Style sheets allow you to format all Web pages in a site consistently
- Using plug-ins, audio, and video sparingly
Designing a Web Site (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 Web site
• Each page in the Web structure should have a distinct message
• Can benefit from using Web site diagramming and mapping tools
Content

• Without anything to say, your Web site will fail
• 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
Each Web page should have a title
Place meaningful words in the first sentence appearing on your Web page
Clear writing is important
Graphics

• Use either JPEG or GIF 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 an ALT attribute for images and image hot spots
• Examine your Web site 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 Web site
• Encourage your viewers to bookmark your site
promotion

• promote your site
• submit often to search engines
• include key words in metatags
• encourage your readers to bookmark your Web site
Creating Blogs (Web Logs)

- Permalink specific for the blog post
- The headline or title of the post
- The primary link
- An optional summary
- The blog text or commentary
- An optional image
- A block quote
- Links for comments from other people
- Other blog software features
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
Figure 11.21 Extensible style language transformation (XSLT) software can be used to make XML documents and transform them into many different formats for a variety of platforms.
Ajax

- Uses both JavaScript and XML to obtain small amounts of data from a server without leaving the Web page.
- The user does not have to wait for a new Web page to display after making a selection.
Cascading Style Sheets (CSS)

• CSS allows you to specify the font family, size, color, border and so on
• Styles may vary for different media, such as display, print, or handheld devices
• Styles do not allow you to manipulate the data
Summary

- Output
- Output design objectives
- Output content
- Output technologies
- Presentation of output
- Printed reports
- Display output