

Designing Effective Output

11

Systems Analysis and Design, 7e Kendall & Kendall

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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

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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

Output Method	Advantages	Disadvantages
Printer	<ul style="list-style-type: none"> Affordable for most organizations Flexible in types of output, location, and capabilities Handles large volumes of output Highly reliable with little down time 	<ul style="list-style-type: none"> Still requires some operator intervention Compatibility problems with computer software May require special, expensive supplies Depending on model, may be slow Environmentally unfriendly
Display screen	<ul style="list-style-type: none"> Interactive Online, real-time transmission Quiet Takes advantage of computer capabilities for movement within databases and files Good for frequently accessed, ephemeral messages 	<ul style="list-style-type: none"> May require cabling and setup space Still may require printed documentation
Audio output and podcasts	<ul style="list-style-type: none"> Good for individual user Good for transient messages Good where worker needs hands free Good if output needs to be widely distributed 	<ul style="list-style-type: none"> Is expensive to develop Needs earbuds where output will not interfere with other tasks Has limited application
DVD, CD-ROM, and CD-RW	<ul style="list-style-type: none"> Has large capacity Allows multimedia output 	<ul style="list-style-type: none"> Requires a computer for reading data
Electronic output (email, Web sites, blogs, and RSS feeds)	<ul style="list-style-type: none"> Reduces paper Can be updated very easily Can be “broadcast” Can be made interactive 	<ul style="list-style-type: none"> Is not conducive to formatting (email) Is difficult to convey context of messages (email) 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

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

Text

- 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

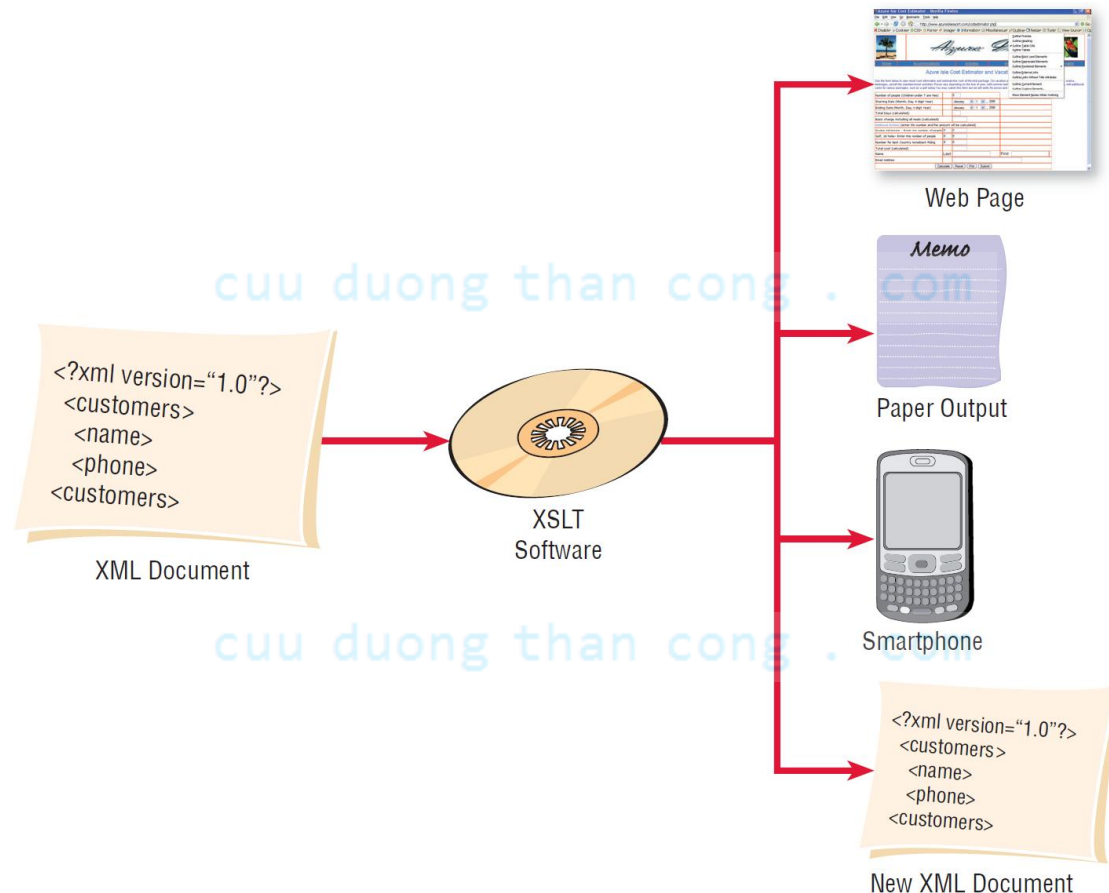
- An XML document may be transformed into different output media types
- Methods:
 - Extensible Style Language Transformations (XSLT)
 - Ajax
 - Cascading style sheets (CSS)

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