

- 8.1 Input necessary data only. Do not input a data item unless it is needed by the system. A completed order form, for example, might contain the name of the clerk who took the order. If that data is not needed by the system, the user should not enter it.
- 8.2 Do not input data that the user can retrieve from system files or calculate from other data. In the order system example shown in Figure 8-15 on page 314, the system generates an order number and logs the current date and time. Then the user enters a customer ID. If the entry is valid, the system displays the customer name so the user can verify it. The user then enters the item and quantity. Note that the description, price, extended price, total price, sales tax, and grand total are retrieved automatically or calculated by the system.
- 8.3 Do not input constant data. If orders are in batches with the same date, then a user should enter the order date only once for the first order in the batch. If orders are entered online, then the user can retrieve the order date automatically using the current system date.
- 8.4 Use codes. Codes are shorter than the data they represent, and coded input can reduce data entry time. You will learn more about various types of codes in Chapter 9, Data Design.

CASE IN POINT 8.2: BOOLEAN TOYS

When should a systems analyst decide a design issue, and when should users be allowed to select what works best for them? The field of ergonomics is concerned with improving the work environment and studying how users interact with their environment.

Suppose you are a systems analyst studying the order processing system at Boolean Toys, a fast-growing developer of software for preschool children. You know that many data entry users have complained about the input screens. Some users would prefer to rearrange the order of the fields; others would like to change the background color on their screens; still others want shortcuts that would allow them to avoid a series of introductory screens.

What if Boolean's users could customize their own data entry screens without assistance from the IT staff by using a menu-driven utility program? What would be the pros and cons of such an approach?

SOURCE DOCUMENT AND FORM DESIGN

No matter how data enters an information system, the quality of the output is only as good as the quality of the input. The term **garbage in, garbage out (GIGO)**, is familiar to IT professionals, who know that the best time to avoid problems is when the data is entered. The main objective is to ensure the quality, accuracy, and timeliness of input data. Unfortunately, the dream of a "paperless office" has never been realized. Even with RFID technology and automated data capture, we still enter data on source documents and forms, and instead of a human-computer interface, systems analysts must deal with the challenge of a human-paper interface.

A **source document** collects input data, triggers or authorizes an input action, and provides a record of the original transaction. During the input design stage, you develop source documents that are easy to complete and use for data entry. Source documents generally are paper-based, but also can be provided online. Either way, the design considerations are the same.

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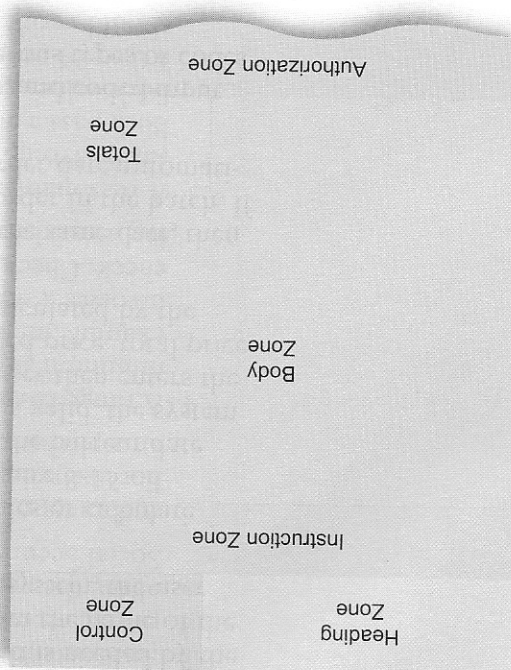


FIGURE 8-18 Source document zones.

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PRINTED OUTPUT

Before designing printed output, ask yourself several questions:

- Why is this being delivered as printed output, rather than screen-based information, with an option for users to view, print, or save as needed?
- Who wants the information, why is it needed, and how will it be used?
- What specific information will be included?
- Will the printed output be designed for a specific device?
- When and how will the information be delivered, and how often must it be updated?
- Do security or confidentiality issues exist? How will they be managed?

Consider a time when you struggled to complete a poorly designed form. You might have encountered insufficient space, confusing instructions, or poor organization, all symptoms of incorrect form layout. Good form layout makes the form easy to complete and provides enough space, both vertically and horizontally, for users to enter the data. A form should indicate data entry points clearly using blank lines or boxes and descriptive captions. Also consider using check boxes whenever possible so users can select choices easily. However, be sure to include an option for any input that does not match a specific check box. The placement of information on a form also is important. Source documents typically include most of the zones shown in Figure 8-18. The heading zone usually contains the company name or logo and the title and number of the form. The control zone contains codes, identification information, numbers, and dates that are used for storing completed forms. The instruction zone contains instructions for completing the form. The main part of the form, called the body zone, usually takes up at least half of the space on the form and contains captions and areas for entering variable data. If totals are included in the form, they appear in the totals zone. Finally, the authorization zone contains any required signatures.

Information should flow on a form from left to right and top to bottom to match the way users read documents naturally. That layout makes the form easy to use for the individual who completes the form, and for users who enter data into the system using the completed form.

The same user-friendly design principles also apply to printed forms such as invoices and monthly statements, except that heading information usually is printed. You should make column headings short but descriptive, avoid nonstandard abbreviations, and use reasonable spacing between columns for better readability. The order and placement of printed fields should be logical, and totals should be identified clearly. When designing a preprinted form, you should contact the form vendor for advice on paper sizes, type styles and sizes, paper and ink colors, field placement, and other important form details. Your goal is to design a form that is attractive, readable, and effective.

Layout and design also are important on Web-based forms, and you can find many resources that will help you design efficient, user-friendly forms. For example, Luke Wroblewski, a well-known author and consultant, maintains a Web site at www.lua.com. His site offers valuable suggestions, guidelines, and examples of Web-based forms.