Data Processing Systems Analysis & Design

second edition

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Preface

This text is designed specifically for the college student who has had an introductory course in data processing or computer technology and is now taking his first course in systems analysis. In it we discuss how a company organizes itself to use data processing equipment more effectively, and teach the use of the various tools employed by the systems analyst in the creation of better systems. The text, which is divided into four parts, is designed to teach the student the nature of the systems development cycle and how to use systems tools in each phase of the cycle.

Part 1 explains the use of data processing systems in today's business environment and defines the roles played by people in an organization in planning, designing, testing, and implementing a new system. It also describes hardware and software currently used.

Part 2 introduces elementary systems techniques and tools. The use of charting, operations research, and forms design are explained fundamentally. At this stage the reader should have a working knowledge of the basic systems tools, and understand their practical use in subsequent parts.

The third part details the key steps in the systems development cycle: feasibility study, systems design, and testing and conversion. Related techniques are interspersed so that the student may learn the technique at the particular stage of systems development when it is used most frequently. Data gathering is discussed with feasibility studies; systems documentation is associated with systems design and with testing and conversion; documentation and systems controls also are covered.

The final part deals with some of the practical applications and considerations in systems analysis: systems management, project planning, and management information systems.

Effective computer systems require an understanding of the interrelationship of each phase of systems development and a mastery of the systems analyst's tools. More importantly, they require a realization that systems are carried out by people–and understanding people, their working habits and their needs is the greatest asset a systems analyst can possess.

Robert J. Condon

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chapter 1

Systems Development

Objectives

This chapter outlines the ways in which the term "system" is used today in business applications. Since businesses constantly change, the steps a business takes to install a new system to meet its changing requirements are discussed.

From the time that a request for a systems change is made until the time the new system is in operation, an organization must plan, design, test, control, and implement the proposed system.

For a system to work properly, management must set goals and provide the means for achieving these goals. The data processing department must design and program the system, and then test it. The operations department must run the new system when it is ready, and constantly check to see that it is performing properly.

WHAT IS A SYSTEM?

Many people freely use the term "system" with no precise definition in mind. "What we need around here is a new system" or "This system isn't really working" are statements used often with little understanding of effective alternatives. The "system" is blamed for a wide range of business

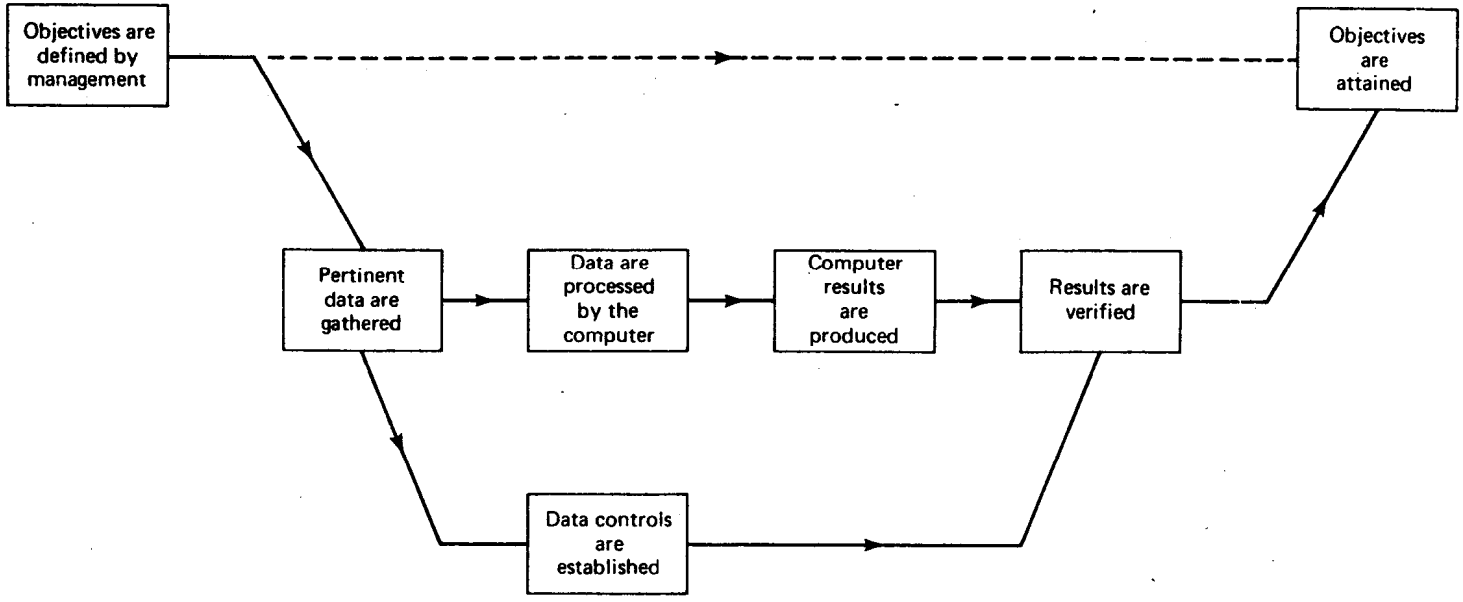

Fig. 1-1. Components of a computer-based system.

problems, and, as will be discussed, a firm's effectiveness is largely dependent upon its data processing systems.

A system may be defined informally as a set of procedures designed to accomplish a predetermined objective. Although the term "systems" is used in many other fields, we are concerned only with business systems.

A business system (Fig. 1-1) usually has the following characteristics:

1. Systems objectives are defined by corporate management.
2. The system is composed of procedural steps.
3. The system uses data.
4. The system uses equipment.
5. The system produces information.
6. The system is controlled to ensure accuracy of information.

DEVELOPMENT OF SYSTEMS

Although most complex systems now use computers to achieve objectives, many developed from manual and accounting machine systems. Most companies once used, and many small companies still do use, manual systems for accounting records. Such systems are appropriate where the volume of transactions is relatively low. Larger companies have gradually converted their manual systems to computerized systems. The movement to computers began soon after World War II when business became more aware of the potential of the punched card for solving paper-work problems (Fig. 1-2).

Fig. 1-2. Originally all accounting data was processed manually by bookkeepers. (Courtesy of NCR)

Equipment for processing punched card data, which had existed since the end of the nineteenth century, increased in popularity after World War II. Punched cards could be sorted, counted, merged with other files of cards, and the contents added and printed. Punched card processing equipment continues to be used in small installations (Fig. 1-3).

Fig. 1-3. A configuration of IBM punched card "unit record" equipment popular in the 1950s (Courtesy of IBM)

Bookkeeping methods were automated in the period following World War II. National Cash Register (NCR) and the Burroughs Corporation developed posting machines that added columns and appropriately displayed data (Fig. 1-4).

Fig. 1-4. Bank tellers processed transactions on bookkeeping machines in 1929. (Courtesy of NCR)