SYSTEMS ANALYSIS AND DESIGN

Leon Youssef

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LEON A. YOUSSEF
Roosevelt University
Chicago, Illinois

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To my wife, Carmen, and my children, Jim and Roxanne, my profound affection.

PREFACE

The purpose of this text is to bring into focus the basic concepts of systems analysis and design at a level suited for university and college business students of different areas of specialization. The materials have been organized to accomplish two main objectives. The first is to equip both the undergraduate and the graduate student with basic concepts of business systems analysis and design. The second is to develop a serious interest among promising candidates to pursue some future study and specialization in this fairly new area.

Previous knowledge of basic concepts of data processing is expected on the part of the reader of this text. The order of presentation of the chapters is designed to establish instructional building blocks to fulfill the aforementioned objectives.

The content of this text has been developed during an extensive period of teaching experimentation with a fairly representative sample of college students. Constant feedback and instructor-student interaction were of great significance in the materialization of this outline. Special care has been taken to provide the reader with sufficient numbers of illustrations and real-life applications.

The scope of this text is restricted to three parts. Part I covers the concepts of information flow, business systems analysis, tools for systems analysis, scope of systems analysis, and feasibility study. Part II deals with the concepts of business systems design, design of computer output forms, data management, and systems implementation and file protection. Part III is devoted to a summary of two higher level languages—namely, FORTRAN and COBOL.

LEON A. YOUSSEF

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PART I

chapter 1 INFORMATION FLOW

Business organizations are divided into a number of functional groupings to assure their survival and success in the world of competitive economy. Responsibility centers such as accounting, credit, finance, marketing, personnel, production, purchasing, and sales contain all activities sharing the same characteristics. All are typical examples of functional groupings.

In the conventional organizational structure, levels of management are presented in a hierarchical form (Figure 1). Management uses the organizational chart to establish a flow of information necessary to achieve organizational goals. It is a pictorial presentation of the interrelationship among all the responsibility centers. Basically, an organizational chart depicts:

1 / the responsibility centers existing within an organization
2 / the hierarchy of the organizational structure and levels of management
3 / the delegation of authority and assignment of responsibility within a business entity.

In modern business, expansion, acquisition, and the incorporation of new products are some of the dynamic changes encountered on a

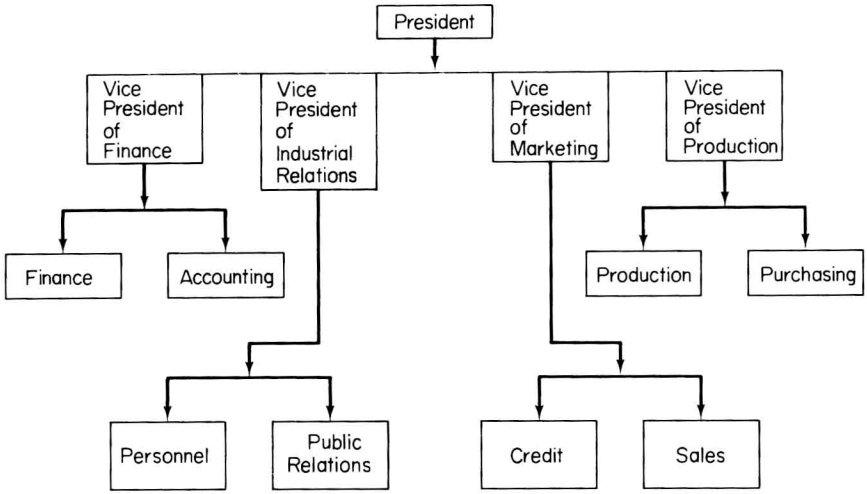

FIGURE 1 The Hierarchy of Organizational Structure.

daily basis. Therefore, constant revision of the organizational chart is necessary for sound planning and control.

The conventional organizational chart facilitates the delegation of authority and the assignment of responsibility at each level without allowing crossed boundaries between responsibility centers. Exchanges of information must be through the chain of command. For example, the marketing department manager could not acquire any information by getting in direct contact with the purchasing department.

In this chapter, three major topics are discussed: (1) the information flow generated within a business firm and the inside users, (2) the outside users of business information, and (3) an evaluation of three types of data processing. It should be emphasized that the information flow is not only confined to profit-oriented organizations, but also covers non-profit institutions as well. The discussion in this text, however, is geared toward business-oriented organizations.

INSIDE INFORMATION USERS

ACCOUNTING

The accounting department creates, maintains, processes, and retrieves quantitative data related to the amount of profit or loss,

cash flow, inventory valuation, payroll, cost allocation, and expense classification.

Managerial accounting provides both qualitative and quantitative information mainly related to areas of budgeting and prediction. Model planning, trends of consumer behavior, and trends of economic conditions are examples of qualitative aspects of information flow.

Management seeks information relevant to its decision-making such as data on investments in new projects, the current financial positions of the firm, and the control of expense accounts. Plant managers seek information relevant to material, labor, and overhead costs. Sales managers are anxious to know the amount of contribution margin of different products.

FINANCE

The finance department is in charge of activities related to borrowing, funding, and ascertaining necessary liquidity. Therefore, data related to the capital structure, the number of outstanding shareholders, the degree of leverage, and the maturity dates of debits and treasury stocks must be available. Data related to prime interest rates, capital, and cash market conditions must be constantly maintained. Data in the finance department are qualitative, quantitative, and highly changeable; therefore, the flow of pertinent information must be constantly updated and maintained.

Top management seeks information relevant to decisions that would maximize the ultimate welfare of the outstanding shareholders.

PERSONNEL

The personnel department plays a vital role as a responsibility center in an organization. Service contracts, fringe benefits, hourly rates, service seniorities, and aptitude tests are a few examples of the duties of the personnel department.

Personnel information is provided to other responsibility centers. For example, the payroll division is furnished with periodic reports containing names of current authorized employees and members; plant managers receive similar updated weekly reports. Management seeks information pertaining to the number of full-time and part-time employees, supervisor reports, and ethnic and sex manpower.

It is apparent that the structure of personnel data must be

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