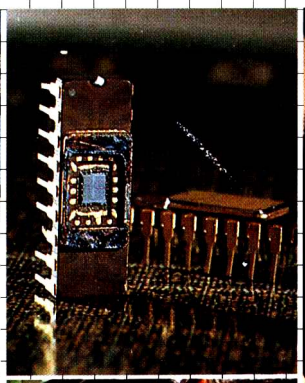
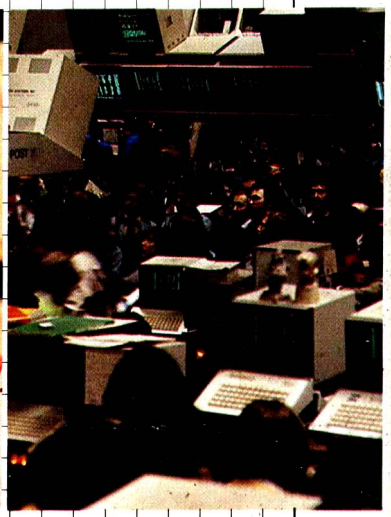
Principles of Data Processing

Ralph M. Stair, Jr.

Concepts, Applications, and Cases





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Concepts, Applications, and Cases

1984 Revised Edition

Ralph M. Stair, Jr.
The Florida State University

RICHARD D. IRWIN, INC.
Homewood, Illinois 60430

Cover photos courtesy of (left to right):

Honeywell Information Systems
Tektronix
Bell Laboratories
IBM Corporation
Chicago Board Options Exchange

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ISBN 0-256-02991-1
Library of Congress Catalog Card No. 83–81173
Printed in the United States of America

2 3 4 5 6 7 8 9 0 D 1 0 9 8 7 6 5 4

Principles of Data Processing

Concepts, Applications, and Cases

The Irwin Series in Information and Decision Sciences

Consulting Editors

Robert B. Fetter
Yale University

Claude McMillan
University of Colorado

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To Lila and Leslie

The overall purpose of this book is to provide students with an up-to-date and comprehensive introduction to the principles of computers and data processing. This book and accompanying student learning aids and language supplements are intended for the first course in computers and data processing. Previous course work and computer-related experience are not required.

Every effort has been made to make this data processing "package" one of the most effective on the market today. In order to accomplish this objective, a number of features have been built into the book, the study guide, and the language supplements.

FEATURES OF THE TEXT

To facilitate learning, the text uses an integrative approach with a logical flow from one topic to the next. Whenever possible, the material in one section is related and integrated with material in other sections. Furthermore, students are asked to take an active role in the learning process.

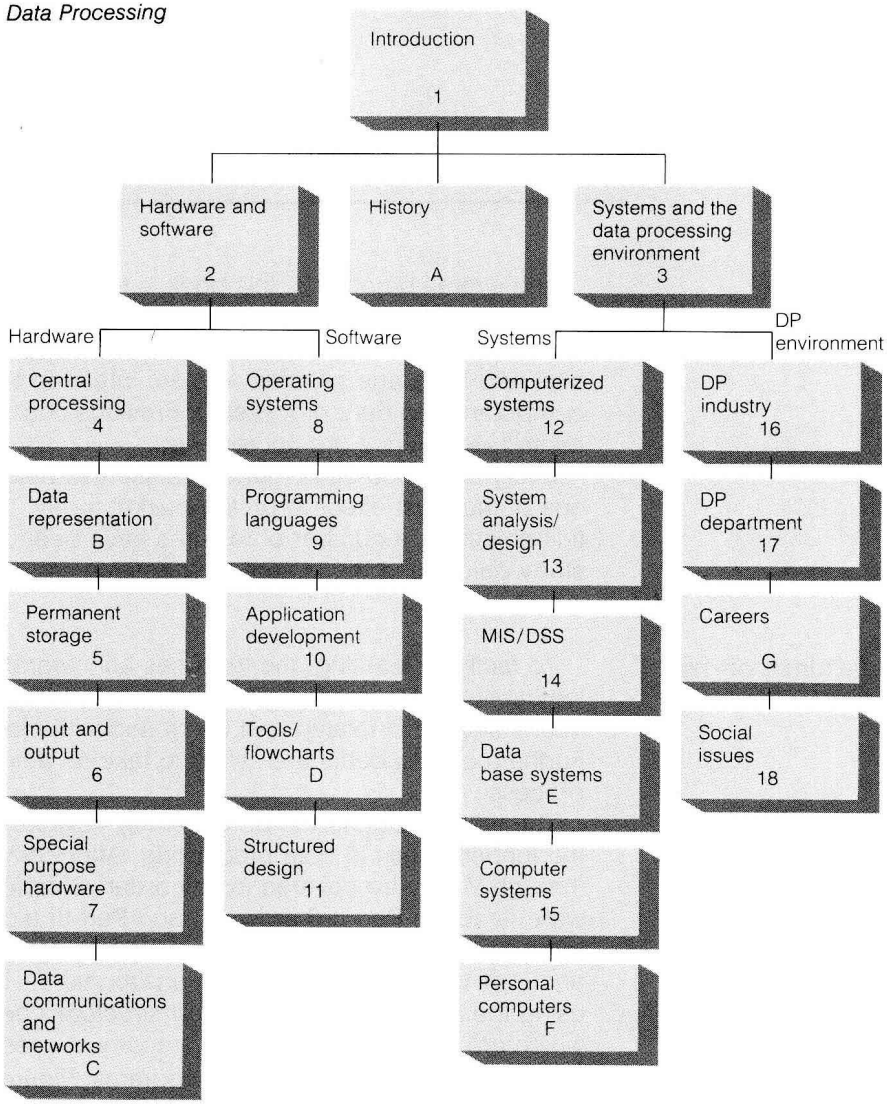
The text is designed to be extremely flexible. The first part covers the fundamentals of data processing. After completing Part I, Parts II through V may be covered in any order. Chapter 2 (hardware and software) leads to Part II (hardware) and Part III (software). Chapter 3 (systems and the data processing environment) leads to Part IV (systems) and Part V (the data processing environment). This book is designed using the *top down* approach and *structured design.* These concepts, which are covered in this book, are very successful techniques used to design computer systems and programs. Figure 1 portrays the organization and structure of the book.

A set of integrated cases at the end of the book ties together the chapters for each part and integrates the parts into a unified whole. One case is continued for every part. Students will be able to trace a growing company and experience some of the data processing problems that occur. Some of the cases are also continued in the instructor's manual. The overall approach is to apply what is learned to real situations.

Each chapter is designed to be a complete learning package. The chapter starts with a chapter outline and several learning objectives.

Figure 1

Structure chart for *Principles of Data Processing*



There are ample illustrations and pictures, and the writing style is simple and concise. A detailed summary is at the end followed by a list of key terms and concepts and a list of short answer questions. Following the questions, there is a miniquiz which is self-correcting. The miniquiz tests students on the knowledge they have acquired and the extent to which they have satisfied the learning objectives. There is at least one item of interest in each chapter. This item of interest is either an article from a newspaper or journal, a quotation from a key executive in the

data processing industry, or an actual success story of how a profit or nonprofit organization was able to successfully use a computer system. These items of interest have been selected to strengthen a point made in the chapter and to increase student interest in data processing in general.

This book also contains several support modules to various chapters. These support modules explore careers in data processing, discuss important social issues, cover the use of inexpensive microcomputers, or investigate computer numbering systems and data representation. These support modules can be covered or omitted without loss of continuity depending upon the purpose of the course and the desires of the instructor.

A NOTE TO STUDENTS ON HOW TO USE THE TEXT AND SUPPLEMENTS

How you use this text depends in part upon the instructor. There is great flexibility in designing the course and in using the materials in this package. Your instructor will decide whether or not you will need the student learning aid or one or more of the language supplements. Once the supplements and materials to be used have been determined, it will be your responsibility to get the most from the assigned work. Here are some hints.

After a chapter or support module has been assigned in the text, you should first look at the chapter outline. This will give you an overview of the major topics that will be discussed. Next, you should read and make a note of the learning objectives. At the end of the chapter or support module, you will be expected to have accomplished these objectives. While you are reading the chapter or support module, you may wish to place your own notes in the margin. After reading the material, review the key terms and concepts and do all of the end-of-chapter questions and exercises. If you believe you understand the material, try the miniquiz. Once you have completed all of this, you might want a final review before reading new material. The best way to do this is to review the outline, the learning objectives, the questions, and the key terms and concepts. This review process will help you retain the material for future use.

Your learning should not be limited to this text or the courses you are taking. Take an active part in your education. Read newspaper and magazine articles that describe how the computer has been used in your field. Computer manufacturers are willing to supply students with information on a number of subjects related to data processing and computers. If the local branch does not have the information, ask for the address and phone number of the national office. These companies realize you may be a future employee or customer, and they are willing to help you. You may also want to talk to several local companies about how they use computers in business. This could give you some excellent contacts for future employment.

HOW THIS BOOK WAS WRITTEN

The writing and publication of this book used computerization at every stage. Using a microcomputer and word processing, the entire book was placed on a few small floppy disks. The book was carefully checked and edited. Both students and professors helped by providing suggestions, which were incorporated into the book and the floppy disks. A special program was used to check spelling. Another program was used to check basic grammar. Then the book was sent to the publisher for further checks and entered into production. A typesetter, using a large computer, transferred the chapters from the floppy disks to large disk devices. Further checks and a few minor modifications were made. Special typesetting programs were then used to transfer the chapters on the large disks into the book you are now reading.

ACKNOWLEDGMENTS

I am indebted to a number of organizations that freely gave me information, pictures, brochures, and encouragement. Bill Anthony, the Department of Management, and the College of Business at Florida State University gave the support I needed to complete this project. I am also indebted to Ralph Janaro, John Malley, Roger McGrath, and Bill Walker for taking major responsibility in developing the language supplements and in making suggestions for the improvement of the text and accompanying materials. Diane Dyer helped by coordinating much of the typing and clerical work associated with this book. Thanks to David Kirkland, Henrietta Holmes, Cathy Seery, Betty K. Smith, and Elaine Martin for their help.

Special thanks goes to my typing team that placed this manuscript on the IBM Personal Computer using WordStar. This team consisted of Rhonda Bratcher, Robin Woods, Lisa Justice, Cathy Wesley, and Beverly Taku.

I would also like to thank my wife, Lila, for taking a very active role in this project.

I am grateful to a number of individuals for reviewing the text and accompanying materials and for providing useful suggestions. Claude McMillan and Robert Fetter made many useful suggestions. Some of the other reviewers that I am indebted to include: Professor W. James Abbott, Jr., Broome Community College; Professor Tanya Burke, Oxnard College; Professor Peter L. Irwin, Richland College; Professor Robert Keim, Arizona State University; Ms. Vicky Crittenden, Florida State University; and Professor Robert J. Condon, Westchester Community College.

Those who completed the questionnaire pertaining to the introductory data processing course which was provided to the author during the revision of this textbook are: Professor Larry Arp, Indiana State University, Evansville; Professor L. Green, Durham Technical Institute; Professor Joseph Cebula, Community College of Philadelphia; David B. Newhall, North Shore Community College; Professor John Shepherd,

Indiana University of Pennsylvania; Professor Richard J. Kapperman, El Camino College; Professor William R. Kenney, San Diego Mesa Junior College; Professor Angelo De Cesaris, King's College; Professor Herbert F. Rebhun, University of Houston, Downtown College; Professor Carol Rowey, Community College of Rhode Island, Flanagan; Professor Stanley J. Birkin, University of South Florida; Professor Marilyn Meyers, California State University; Sister Carolyn Therese, Seton Hall University; Sister Marilyn Therese, Seton Hall University; Professor Carol Hershberger, Olympic College; Professor Duane Braaten, Mankato State University; Professor Anthony Basilico, Community College of Rhode Island; Professor Isaak Benbasat, University of British Columbia; Professor Barry Shore, University of New Hampshire; Professor Monte J. Johnson, St. Cloud State University; and Professor Laura Saret, Oakton Community College.

AMERICAN EXPRESS

The concepts presented in any introductory course are many and varied. This is certainly true of any introductory course in data processing. It can be very difficult for students to pull these concepts together. It can also be difficult for students to comprehend how various concepts and materials are applied in actual organizations. To overcome these difficulties, we will show you how a large and successful organization has efficiently and effectively employed data processing facilities.

The company we will feature in this book is American Express Travel Related Services Company, Inc. (referred to in this book as American Express). In most chapters, you will see how the concepts you are learning have been implemented by American Express. This will give you the unique opportunity to see how one company uses hardware, software, data bases, data processing personnel, and operational procedures to its benefit.

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I would like to thank Jim Welch, Terry Smith, Bob Lemker, Mike Connolly, Jim Kravit, Joseph Rosenbaum, and many others at American Express for their help in developing this material.

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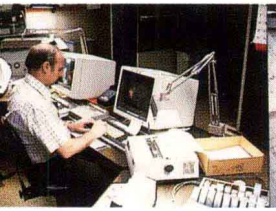

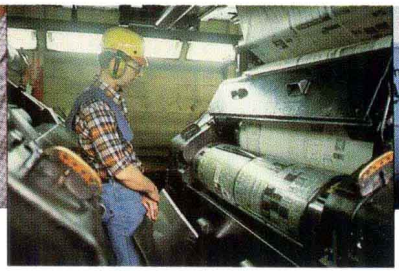

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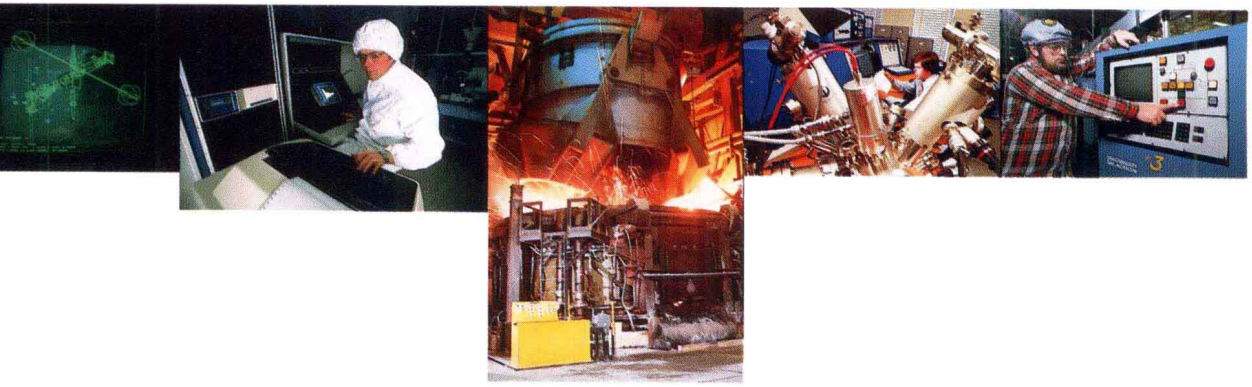

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