

SYSTEMS ANALYSIS FOR BUSINESS MANAGEMENT

third edition

STANFORD L. OPTNER

*Consultant in Systems Engineering and
Data Processing*

President, Stanford L. Optner & Associates, Inc.

TECHNISCHE HOCHSCHULE DARMSTADT	
Fachbereich 1	
<u>Gesamtbibliothek</u>	
<u>Betriebswirtschaftslehre</u>	
Inventar-Nr. :	<u>32.736</u>
Abstell-Nr. :	<u>A 13/241</u>
Sachgebiete:	<u>1.4</u>

Prentice-Hall, Inc., Englewood Cliffs, New Jersey

CONTENTS

Preface xi

PART ONE: SYSTEMS ANALYSIS

1. The Origins of Systems Analysis 3

- Initial Impetus—National Defense
- Original Applications of Systems Analysis in the United States
- The Weapons System The Information System
- Developments Leading to the Computer
- Early Awareness of the Problem-Solving Potential of Systems Analysis Problems

2. Some Basic Concepts of Systems 18

 Using the Term "System" Systems Integration
 Horizontal Integration Vertical Integration
 System Functions and Operations
 Using the Computer to Automate Vertical and Horizontal Systems
 The Challenge for Systems Design Problems

3. The Logical Basis for Systems 36

 A Summary of Systems Methodology
 Information-Tight Systems Machinelike Systems
 Man-Dominated Systems Man-Machine Systems Problems

4. The Elements of Systems 54

 Input, Output, and Process Placing a Restriction on the System
 Feedback-Control the design of feedback loops
 the design of controls
 The Conditions and Their Impact Upon Systems Elements
 the sufficient (and necessary) condition
 The Concept of a Boundary the redundant condition
 the contradictory condition Problems

5. The Systems Approach 74

 Problem Solving with Systems The Existing System
 Existing Systems Study Checklists The Requirements Analysis
 Requirements Analysis Checklists
 Systems Requirements of the Proposed System Problems

6. Performing the Systems Study 92

 How the Statement of the Problem is Enhanced by Integration
 Placing Limits on the Problem Under Study The Assignment
 Defining the Boundary of a Problem
 Priority of Effort and Schedule Method of Operation
 Accessing the Personal Knowledge of Employees
 Flowcharting the System Under Study
 Staffing the Systems Study Selling the Assignment Problems

7. Alternatives in Systems Design 116

 One-For-One Changeover Designing a New System
 The Use of Benchmarks Mechanization in Systems Design
 The Computer as Processor Side-effects
 Continue With a Manual System Goals of Systems Design
 Identifying the Systems Purchaser Criteria of Systems Design

Design Criteria for a Portion of a Production Control System
Inventory Status as a Criterion of Systems Design Problems

8.	Automatic Data Processing in Business	137
	Characteristics of Automatic Data Processors <i>Speed</i>	
	<i>Automatic Operation</i> <i>Flexibility</i> <i>Decision Making</i>	
	Computer Software	
	Organizing to Centralize Computer Processing	
	Making a Feasibility Study	
	Questions to Be Answered by a Preliminary Survey	
	Outline of a Typical Feasibility Study	
	Glossary of Computer Terms Problems	
9.	Applying Statistical-Mathematical Techniques in Business	159
	Brief History Techniques of Operations Research	
	<i>Descriptive Statistics</i> <i>Statistical Sampling</i>	
	<i>Correlation and Regression Analyses</i> <i>Linear Programming</i>	
	<i>Factor Analysis</i> <i>Control System Analysis</i> <i>Simulation</i>	
	Systems Analysis and Operations Research	
	Operations Research and a General Business Systems Theory	
10.	Constructing the Systems Costs	171
	Defining Savings and Cost Advantages	
	<i>Savings that Provide No Relief of Existing Costs</i>	
	<i>Benefits versus Savings</i> <i>Intangible Savings</i>	
	One-Time versus Recurring Costs	
	Displaceable and Nondisplaceable Costs	
	The Presentation of System Cost Data Cost-Benefit Analysis	
	<i>Net Benefit Analysis</i> <i>Payback Reciprocal</i> <i>Rate of Return</i>	
	Sample Computations <i>Net Benefit Analysis</i>	
	<i>Payback Reciprocal</i> <i>Rate of Return</i>	

PART TWO: USING SYSTEMS ANALYSIS IN CASE STUDIES

11.	Educational Materials Corporation Using systems to evaluate the financial data of a prospective acquisition	193
12.	Home Products Electronics Corporation—1 Describing the objectives and constraints under which a project should be carried out	200
13.	Home Products Electronics Corporation—2 Identifying all of the potential problems that may be involved in a system	209

14. Home Products Electronics Corporation—3 Making a statement of the problem, identifying critical systems requirements	216
15. Home Products Electronics Corporation—4 A partial solution of the total problem under study	231
16. Problems of the Nonautomated Library in Book Ordering Description of an existing system	237
17. Designing an Automated System for the Procurement of Books Description of a proposed system	246
18. Problems of Automated Book Acquisition Evaluating the performance of an on-going automated system	275
19. Request for Proposal of the California State Library Stating the necessary and sufficient conditions of a problem	281
20. Answer to Request for Proposal of the California State Library Stating the solution to a problem in answer to the statement of the problem	292
21. Request for Proposal of Fresno County, California Describing a complex problem and an information system which must satisfy different levels of users	314
22. Answer to Request for Proposal of Fresno County, California Proposing an information system in answer to the statement of the problem	325
Bibliography	365
Index	377