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作业管理

(第二版)

Operations Management

(Second Edition)

(英文版)

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Robert A. Davis

世界财经与管理教材大系



东北财经大学出版社

图书在版编目 (CIP) 数据

作业管理: 第二版: 英文 / (美) 马克兰德 (Markland, R.E.) 等著. —大连: 东北财经大学出版社, 1998.3

(世界财经与管理教材大系·管理系列)

ISBN 7 - 81044 - 392 - 5

I. 作… II. 马… III. 作业管理 - 英文 IV. C931.2

中国版本图书馆 CIP 数据核字 (98) 第 06039 号

辽宁省版权局著作权合同登记号: 图字 06 - 1998 - 76 号

Robert E. Markland, Shawnee K. Vickery, Robert A. Davis: Operations Management: Concepts in Manufacturing and Services, Second Edition

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东北财经大学出版社出版

(大连市黑石礁尖山街 217 号 邮政编码 116025)

东北财经大学出版社发行

北京万国电脑图文有限公司制版 沈阳第二印刷厂印刷

开本: 787×1092 毫米 1/16 字数: 1 516 千字 印张: 60.75 插页: 2

1998 年 4 月第 1 版

1998 年 4 月第 1 次印刷

策划编辑: 方红星

封面设计: 韩 波

定价: 98.00 元

ISBN 7 - 81044 - 392 - 5/F·1077

出版者的话

但凡成事，均缘于势。得势则事成，失势则事不顺。顺势而行，如顺水行舟；借势而动，如假梯登高；造势而为，如太空揽月。治学、从政、经商、置业，均不可一日失势。势者，长处、趋势也。

今日中国，是开放的中国；当今世界，是开放的世界。改革开放，大势所趋，势不可挡。经济开放、文化开放、政治开放，世界需要一个开放的中国，中国更要融入开放的世界。借鉴国际惯例，学习他人之长，已经到了不可不为之时。

借鉴国际惯例，学习他人之长，已属老生常谈，但学什么、如何学、以何为蓝本为众多志士仁人所关注。可喜的是，由赤诚图文信息有限公司精心策划，ITP、McGraw-Hill及Simon & Schuster等国际出版公司特别授权，东北财经大学出版社荣誉出版的“世界财经与管理教材大系”现已隆重面世！她以“紧扣三个面向，精选五大系列，奉献百部名著，造就亿万英才”的博大胸襟和恢弘气势，囊括经济学、管理学、财务与会计学、市场营销学、商务与法律等财经、管理类主干学科，并根据大学教育、研究生教育、工商管理硕士（MBA）和经理人员培训项目（ETP）等不同层次的需要，相应遴选了具有针对性的教材，可谓体系完整，蔚为大观。所选图书多为哈佛、斯坦福、麻省理工、伦敦商学院、埃维商学院等世界一流名校的顶尖教授、权威学者的经典之作，在西方发达国家备受推崇，被广为采用，经久不衰，大有“洛阳纸贵”之势。

借鉴国际惯例，毕竟只是因势而动；推出国粹精品，才是造势而为。在借鉴与学习的同时，更重要的是弘扬民族精神，创建民族文化。“民族的，才是国际的”。我们提倡学他人之长，但更希望立自己之势。

势缘何物，势乃人为。识人、用人、育人、成人，乃人本之真谛。育人才、成能人，则可造大势。育人、成人之根本在教育，教育之要件在教材，教材之基础在出版。换言之，人本之基础在书本。

凡事均需讲效益，所谓成事，亦即有效。高效可造宏基，无效难以为继，此乃事物发展之规律。基于此，我们崇尚出好书、出人才、出效益！

东北财经大学出版社

1998年4月

This book is dedicated to

Mylla Markland
Kevin, Kelly, and Griffin Markland
Keith and Debbie Markland
R.E.M.

James E. Vickery
Michael James Vickery
S.K.V

Gail Zank
Amy, Matt, and Cameron Costanza
R.A.D.



AS WE APPROACH the twenty-first century, the need for organizations to improve quality and productivity has never been more important. Effective operations management and decision making has a major effect on production, productivity, and quality. The operations function is at the core of a business because here lies responsibility for most of the labor, materials, equipment, information, energy, and capital used to manufacture products and/or provide services. In conjunction with marketing and finance, operations are critical to a company's success in a competitive environment.

Knowledge of operations management prepares managers to face the competitive challenge of effectively managing organizational resources. **Operations management** merges topics from accounting, marketing, industrial engineering, economics, behavioral management, management science, and statistics into a blend of analytical tools and strategic issues. This textbook thoroughly covers the major operations management concepts and issues, and it includes topics involving the production of both goods and services.

In today's globally competitive environment, organizations must approach the operations management function more strategically than was done in the past. We view the operations function as essential in enabling organizations to gain a competitive edge. The text emphasizes the importance of viewing operations from a strategic perspective throughout, and we present tools and techniques for solving problems in the context of meeting a company's strategic goals. This strategic emphasis is also reflected in the organization of the text.

Our objective in writing this text is to enable students to become better managers, particularly if they find themselves working in operations management. A sizable part of the U.S. and international work force is employed in operations jobs. These jobs are important and challenging, and they can lead to rewarding and successful careers. To achieve this objective, we have established several goals for the students who use this text.

- First, we want them to gain a thorough understanding of what operations managers do in manufacturing and service firms.
- Second, we want students to understand the tools and techniques that operations managers use in making operating decisions.
- Third, we hope that students who use this text will discover the excitement that marks this vibrant, dynamic, and rapidly changing field.

- Finally, we trust that the text will introduce some of the many challenges facing those who manage the operations function in service or manufacturing organizations.

MAJOR THEMES IN OPERATIONS MANAGEMENT: CONCEPTS IN MANUFACTURING AND SERVICES



IN DEVELOPING THIS textbook, we focused on the major themes currently shaping the field of operations management. These themes, woven into the fabric of the text, include

- *International operations* The text stresses the importance of the globalization of operations management. This theme, introduced in Chapters 1 and 2, is expanded upon throughout the book.
- *Services* The book covers service operations extensively. Chapter 2 introduces service operations management, and Chapter 17 discusses the design and scheduling of service systems. Numerous service operations examples appear throughout the book.
- *Quality* The text emphasizes the importance of quality and continuous improvement. Chapter 7 provides a perspective on managing quality, and Chapter 19 discusses quality analysis, measurement, and improvement.
- *Strategy* The book also highlights the strategic nature of operations management. One entire chapter, Chapter 3, discusses operations strategy in depth. This chapter includes a case involving operations strategic planning at Allen-Bradley. Strategic issues are discussed throughout the book. The concluding chapter, which revisits the strategic nature of operations management, reflects on what Allen-Bradley has done to become a world-class manufacturer.
- *Technology* The book discusses extensively the use of computers and other technologies in operations management. An entire chapter, Chapter 8, reviews technological developments in operations management. A number of the end-of-chapter problems require computer solutions.
- *Environmental issues* Environmental issues are becoming increasingly important to the field of operations management. Discussed throughout the text, these issues also are featured in the Georgia-Pacific Corporation case study, located in Chapter 6.

WHAT'S NEW IN THE SECOND EDITION?



THE SECOND EDITION of OPERATIONS MANAGEMENT: CONCEPTS IN MANUFACTURING AND SERVICES contains a number of important changes and revisions. Many of the Operations Management in Action and Global Operations Management boxed features

found throughout the text are new or updated. There are also several new case studies. Tables, figures, and content materials throughout the book have been updated. New features and topical coverage include:

- The end-of-chapter problems in Chapters 4 and 11 can now be done using *EXCEL* spreadsheet software.
- Internet Exercises have been added to the end-of-chapter materials in relevant chapters. These activities provide exposure to new technology and real-world examples of operations management.
- Chapter 9 has a new section covering the learning effects on time-standard estimation. The learning curve and uses of the learning curve concept are included in the new material.
- Chapter 10 has been heavily revised for the new edition. It is now titled Global Supply Chain Management, and shows the reader the progression from traditional logistics to supply chain management, SCM for strategic advantage and role of information technology in SCM.
- Chapter 13 has a new section that describes how Distribution Requirements Planning provides a mechanism for integrating the physical distribution system with the production planning and scheduling system.
- Chapter 16's discussion of Just-in-Time production has been augmented with a history of its use in Japan and new coverage of JIT logistics.
- Chapter 20 presents an excellent new synopsis of the characteristics of a world-class manufacturer.
- A glossary of key terms has been added to assist readers.
- All ancillary materials that accompany the second edition of *Operations Management: Concepts in Manufacturing and Services* are new.

TEACHING AND LEARNING AIDS



THE TEXTBOOK CONTAINS numerous features designed to increase its value as a teaching and learning tool. Among the teaching aids we have included are the following:

- *Preview Section* The book begins with a preview section that provides a broad overview of the entire text. In this preview section, we explain the organization of the book in terms of strategic operations decision categories.
- *Flexible Organization* The textbook is organized in a manner that offers flexibility in the order of topics and in the depth of coverage. This organization allows for considerable flexibility in course design. After covering Chapters 1 through 3, instructors can rearrange the remaining chapters to reflect their teaching preferences. Moreover, they can supplement the text's quantitative material by assigning material from any of the five tutorials grouped at the end of the text.
- *Chapter Outlines and Learning Objectives* Each chapter opens with an outline that provides a quick overview of the topics covered in the chapter. The learning objectives are designed to guide students as they study the

chapter. These learning objectives are reviewed and summarized at the chapter's end.

- *Operations Management in Practice Boxes* Each chapter contains several Operations Management in Practice boxes that provide examples of managerial practices in actual companies. Both manufacturing-oriented and service-oriented boxes are included.
- *Global Operations Management Boxes* Most chapters contain Global Operations Management boxes that provide examples of international operations management practices.
- *Key Terms* Key terms are boldfaced and defined where they first appear in the text. They then appear in an end-of-chapter terms list for easy review. All key terms are now included in a Glossary located at the end of the text.
- *Solved Demonstration Problems* Throughout the text, when a new technique is presented, we immediately apply it to a problem and work out a solution for the student.
- *End-of-Chapter Questions and Problems* The text includes numerous end-of-chapter exercises and problems. These relevant questions and problems are both qualitative and quantitative in scope.
- *Cases* The text includes 11 end-of-chapter cases that relate to chapter content and include discussion questions. Illustrative videos supplement several of these cases.
- *Quantitative Tutorials* The text contains five separate quantitative tutorials: The Transportation Problem, Decision Analysis, Linear Programming, Simulation, and Waiting Line Models. These tutorials appear at the end of the text, allowing instructors to use them flexibly with the several chapters to which they apply. Problems relating to the quantitative techniques described in the tutorials appear at the ends of various chapters; these problems relate techniques to specific problem situations.

ANCILLARY MATERIALS



ALL SUPPLEMENTARY MATERIALS have been completely rewritten for the second edition of *OPERATIONS MANAGEMENT: CONCEPTS IN MANUFACTURING AND SERVICES*. They include:

For the Instructor

- The *Instructor's Manual with Solutions* (ISBN: 0-538-87832-0) has been completely redone by John B. Jensen of the University of Southern Maine, and includes chapter and lecture outlines with suggestions for classroom presentation, as well as solutions for all the end of chapters problems and cases.
- The *Test Bank* (ISBN: 0-538-87833-9) has been completely redone by Gail Zank of Eastern Connecticut State University and Robert Vokurka of

Texas A & M University. The new Test Bank has over 1600 test items including true/false, multiple choice, essay questions, short-answer, and quantitative problems where relevant. WESTEST® (ISBN: 0-538-87835-5) computerized testing software allows instructors to create, edit, store, and print exams.

- The *PowerPoint Presentation Software* (ISBN: 0-538-87836-3) prepared by Yunus Kathawala of Eastern Illinois University features visually exciting graphics and demonstrations of text material.
- The *Video Package* (ISBN: 0-538-87865-7) includes over three hours of video segments on current topics that relate to operations management in real companies. Video segments profile large companies, small business applications, and service organizations. A video guide, included in the Instructor's Manual, provides the length of each video, a brief description, and lecture integration suggestions tied directly to the text.

.....
For the Student

- The *Study Guide* (ISBN: 0-538-87834-7) has also been completely redone by Gail Zank and Robert Vokurka. It includes chapter outlines, review materials, key terms, definitions, and multiple-choice, extended-problem, and application questions.
- *EXCEL Spreadsheet Problems and Cases* (ISBN: 0-538-88511-4) prepared by Jayavel Sounderpandian of the University of Wisconsin-Parkside, is a new ancillary for this edition. It will provide experience in using *EXCEL* software to solve problems and prepare case studies on many of the topics included in *Operations Management*.

ACKNOWLEDGMENTS



HIS SECOND EDITION of *OPERATIONS MANAGEMENT* has resulted from the efforts of a great number of people. We greatly appreciate the many comments and suggestions made by our colleagues who reviewed the materials for this textbook. They include:

Douglas A. Elvers,
*University of North Carolina-
Chapel Hill*

Benito E. Flores,
Texas A&M University

Thomas E. Johnson,
University of South Florida

Yunus Kathawala,
Eastern Illinois University

John S. Loucks,
St. Edward's University

Barbara A. Osyk,
University of Akron

Thanks for their fine efforts also go to the new members of the writing team who prepared the ancillaries that accompany the second edition of our text. Jack Jensen, Gail Zank, Robert Vokurka, Yunus Kathawala, and Jay Sounderpandian bring new insight and teaching experience to these products. Shawnee Vickery would also like to thank her MBA students (class of 1998) for identifying Internet sites for the Internet Exercises. Similarly, Bob Markland would like to thank his students Chenfeng Lin and Romulo Ferrero for their assistance in developing new problems and Internet exercises.

Comments and suggestions from the reviewers of the first-edition manuscript are still included in this new edition and we wish to again convey our thanks to them.

Kwasi Amoako-Gyampah, <i>University of North Carolina-Greensboro</i>	Robert Haessler, <i>University of Michigan</i>
Sunil Babbar, <i>Kansas State University</i>	Don Hammond, <i>University of New Orleans</i>
Ronald Benson, <i>Western Connecticut State University</i>	Benjamin Harrison, <i>Salisbury State University</i>
Dean Booth, <i>University of Missouri-Kansas City</i>	Lisa Houts, <i>California State University-Fresno</i>
Elizabeth Booth, <i>Louisiana State University</i>	Anthony Inman, <i>Louisiana Tech University</i>
Ichiu Chang, <i>Arkansas State University</i>	Tim Ireland, <i>Oklahoma State University</i>
William Cosgrove, <i>California State Polytechnic-Pomoma</i>	Robert Johnson, <i>Pennsylvania State University</i>
Ellen Dumond, <i>California State University-Fullerton</i>	Thomas Johnson, <i>University of South Florida</i>
Peter Ellis, <i>Utah State University</i>	Dennis Krumwide, <i>Kansas State University</i>
Doug Elvers, <i>University of North Carolina-Chapel Hill</i>	Wai-kin Law, <i>Florida State University</i>
Kanvar Farahbod, <i>California State University-San Bernardino</i>	David Lewis, <i>University of Lowell</i>
Larry Fredendall, <i>Clemson University</i>	Sathiadeu Mahesh, <i>University of New Orleans</i>
Jim Gilbert, <i>The University of Georgia</i>	Farzad Mahmoodi, <i>Clarkson University</i>
	Satish Mehra, <i>Memphis State University</i>

Suresh Nair, <i>University of Connecticut</i>	L.W. Shell, <i>Nicholls State University</i>
Taeho Park, <i>San Jose State University</i>	Dwight Smith-Daniels, <i>Arizona State University</i>
Peter Pinto, <i>Bowling Green State University</i>	Paul Swamidass, <i>Auburn University</i>
Michael Pohlen, <i>University of Delaware</i>	Scott Swenseth, <i>University of Nebraska-Lincoln</i>
Ranga Ramasesh, <i>Texas Christian University</i>	Kerry Swinehart, <i>Tennessee State University</i>
Russell Reddoch, <i>University of Arkansas at Little Rock</i>	Morgan Swink, <i>Indiana University</i>
Richard Reid, <i>University of New Mexico</i>	Sanford Tempkin, <i>Rider College</i>
George Rimler, <i>Virginia Commonwealth University</i>	Enrique Venta, <i>Loyola University of Chicago</i>
Powell Robinson, <i>Texas A&M University</i>	Ray Warren, <i>Eastern Michigan University</i>
Andrew Ruppel, <i>University of Virginia</i>	Nancy Weida, <i>Bucknell University</i>
Carl Schultz, <i>University of New Mexico</i>	Fredrik Williams, <i>University of North Texas</i>
Gary Scudder, <i>Vanderbilt University</i>	Jiagin Yang, <i>University of North Dakota</i>
John Seydel, <i>University of Mississippi</i>	Jason Zunsheng Yin, <i>Seton Hall University</i>

Last, but not least, we also acknowledge the efforts of the members of the Management and Marketing Publishing Team at South-Western College Publishing who worked with us on the revision. John Szilagyi, our editor and now the Team Director, Developmental Editor Alice Denny, Production Editor Deanna Quinn, and Marketing Manager Steve Scoble should be mentioned in particular. The attractive and useful layout of the new text resulted from the work of Designer Joe Devine, and Art Director Jennifer Mayhall's supervision of photo research.

Robert E. Markland
Shawnee K. Vickery
Robert A. Davis

BRIEF TABLE OF CONTENTS

Preface, xvi

SECTION ONE	INTRODUCTION TO OPERATIONS MANAGEMENT
	CHAPTER 1 Manufacturing Operations, 6
	CHAPTER 2 Service Operations, 42
SECTION TWO	OPERATIONS STRATEGY
	CHAPTER 3 Operations Strategy, 80
SECTION THREE	STRATEGIC DECISION CATEGORIES IN OPERATIONS MANAGEMENT
	CHAPTER 4 Forecasting Demand for Products and Services, 116
	CHAPTER 5 Product Planning and Process Design, 172
	CHAPTER 6 Long-Range Capacity Planning and Facility Location, 210
	CHAPTER 7 Managing Quality, 272
	CHAPTER 8 Technological Developments in Operations Management, 310
	CHAPTER 9 Organization and Human Resources, 344
SECTION FOUR	OPERATION PLANNING AND CONTROL
	CHAPTER 10 Global Supply Chain Management, 382
	CHAPTER 11 Aggregate Production Planning, 414
	CHAPTER 12 Independent Demand Inventory Management, 462
	CHAPTER 13 Dependent Demand Inventory Management: Material Requirements Planning, 512
	CHAPTER 14 Medium- and Short-Range Capacity Planning, 560
	CHAPTER 15 Shop-Floor Control, 596
	CHAPTER 16 Just-in-Time Production, 628
	CHAPTER 17 Design and Scheduling of Service Systems, 656
	CHAPTER 18 Project Management, 698
	CHAPTER 19 Quality Analysis, Measurement, and Improvement, 740
SECTION FIVE	OPERATIONS STRATEGY REVISITED
	CHAPTER 20 Building Competitive Advantage through World-Class Manufacturing: Allen-Bradley's World Contactor Facility, 780
SECTION SIX	TUTORIALS
	TUTORIAL 1 The Transportation Problem, 799
	TUTORIAL 2 Decision Analysis, 820
	TUTORIAL 3 Linear Programming, 841
	TUTORIAL 4 Simulation, 864
	TUTORIAL 5 Waiting Line Models, 881
	Appendix: Tables, 904
	Glossary, 912
	Index, 929
	Acknowledgments, 943

TABLE OF CONTENTS

Preface, xvi

SECTION ONE

Introduction to Operations Management



► INTRODUCTION

A Preview of Operations Management, 1

Strategic Operations Management, 3



► CHAPTER 1

Manufacturing Operations, 6

Introduction, 7

The Transformation Process, 7

Productivity and the Transformation Process, 8

Managing the Transformation Process: The Operations Manager, 10

- *Operations Management in Practice 1.1: Portrait of a Quality Manager at an Award-Winning Manufacturing Company*, 11

Ecologically Sound Manufacturing, 12

- *Operations Management in Practice 1.2: Green Manufacturing at AT&T*, 13

Types of Manufacturing Operations, 14

Project Manufacturing, 15

The Job Shop, 15

Line-Flow Production, 15

Batch Production, 16

Hybrid Processes, 16

The Product-Process Matrix, 17

Company Activities and Strategic Advantage:

The Value Chain, 18

The History of Operations Management, 21

Eli Whitney, 21

Frederick Winslow Taylor, 23

Henry Ford, 24

Alfred P. Sloan, Jr., 26

The Field of Operations Management, 26

Recent Trends in Operations Management, 27

Just-in-Time Production, 27

Total Quality Management, 28

Computers and Computer-Related Operations Technologies, 29

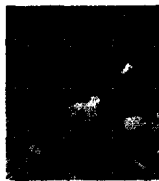
Time-Based Competition, 29

Business Process Reengineering, 31

The Service Factory, 31

- *Operations Management in Practice 1.3: Reengineering at Ford Motor Co.*, 32

- *Case Study: Northern Telecom*, 39



► CHAPTER 2

Service Operations, 42

Introduction, 43

Defining Services, 44

Comparing Service and Manufacturing Operations, 47

Classifying Service and Manufacturing Operations, 47

Characteristics of Service Operations, 49

High Consumer Contact, 49

Consumer Participation in the Service Process, 49

Perishability of Services, 50

Site Selection Dictated by Consumer's Location, 51

Labor Intensiveness, 51

Variable, Nonstandard Output, 52

Intangibility of the Service Output, 52

Difficulty of Measuring Service Productivity, 53

- *Operations Management in Practice 2.1: Hotel Automation: Technology versus Personal Service*, 54

Difficulty of Measuring Service Quality, 55

Strategic Approaches to Service Operations Management, 55

The Service-Process Matrix, 55

The Strategic Service Vision, 57

Service-Sector Trends, 58

- **Operations Management in Practice 2.2:**
ServiceMaster—Stressing Dignity to Its Workers, 59

Increased International Competition in Services, 60

Improving Productivity and Competitiveness in Services, 61

- **Global Operations Management 2.3:**
Global Consulting—Becoming More Competitive in the World Economy, 65

Technology and Automation in Services, 67

- **Operations Management in Practice 2.4:**
On-Line Banking—Will It Finally Become Reality?, 68

Adequacy of Service Jobs, 69

- **Operations Management in Practice 2.5:**
J.C. Penney Riding the Third Wave of Information Technology, 71

Greater Quality Emphasis in Services, 72

- **Case Study:**
Wal-Mart versus Kmart: Diverging Paths, 77

SECTION TWO

Operations Strategy



CHAPTER 3

Operations Strategy, 80

Introduction, 81

Business-Level Strategic Planning, 82

Functional Area Involvement in Business-Level Strategic Planning, 84

The Generic Business Strategies, 85

- **Operations Management in Practice 3.1:**
Strategic Positioning at Haskell of Pittsburgh, 87

Operations Strategic Planning, 88

Operations as a Competitive Weapon, 90

Operations Competitive Priorities, 91

Strategic Operations Choices, 92

- **Global Operations Management 3.2:**
Competitive Priorities at Meiji Seika Kaisha, Ltd., 94

Categories of Strategic Operations Decisions, 95

Product or Service Planning, 95

Process Design and Technology Management, 95

Long-Range Capacity Planning and Facility Location, 96

Quality Management, 97

Manufacturing or Service Organization, 98

Human Resource Management, 98

Operations Planning and Control, 98

Vertical Linkages: The Value Chain Revisited, 99

Vertical Integration and Outsourcing, 99

Supply Chain Management, 100

Assembler-Supplier Relationships in Japan, 102

Global Integration of Operations, 104

- **Global Operations Management 3.3:**
Global Integration of Operations at Xerox, 107

- **Case Study:**
Allen-Bradley, 112

SECTION THREE

Strategic Decision Categories in Operations Management



CHAPTER 4

Forecasting Demand for Products and Services, 116

Introduction, 117

Characteristics of Demand, 118

Factors Influencing Demand, 118

Demand Components, 119

The Forecasting Process, 121

Establish Objectives for the Forecast, 121

Determine What to Forecast, 123

Specify the Time Period for the Forecast, 123

Gather and Analyze Data, 124

Select a Forecasting Method, 124

Make the Forecast, 125

Present the Forecast Results, 125

Monitor and Control the Forecast, 125

Approaches to Forecasting—A Preview, 126

- Qualitative Forecasting Methods, 128
 Naïve Extrapolation, 128
 Sales Force Composite, 128
 Jury of Executive Opinion, 129
 The Delphi Method, 129
- **Global Operations Management 4.1:**
A Delphi Study of Consumer Attitudes toward Travel in Eastern European Countries, 130
 - Market Research Surveys, 131
 - Quantitative Forecasting Methods—Time Series Analysis Models, 131
 - **Operations Management in Practice 4.2:**
Hewlett-Packard: Sales Forecasting in the Fast Lane, 132
 - Time Series Smoothing, 133
 - **Operations Management in Practice 4.3:**
Improving Call Center Forecasting at L.L. Bean, Inc., 144
 - Time Series Decomposition, 145
 - Quantitative Forecasting Methods—Associative Models, 145
 - Regression Models, 146
 - **Operations Management in Practice 4.4:**
Using Regression Analysis to Predict the Sales Price of an Apartment Property, 153
 - Econometric Models, 153
 - Measuring Forecasting Error, 154
 Absolute Measures of Forecasting Error, 154
 Relative Measures of Forecasting Error, 156
 - Monitoring and Controlling Forecasts, 157
 - Using Computers in Forecasting, 160
 - Customer Satisfaction, 176
 Selecting Features for Products and Services, 176
 Customer-Driven New Product Ideas, 177
 - Quality Function Deployment, 179
 From the House of Quality to Operations Requirements, 183
 Application of QFD to New Product Design, 184
 Improving Designs through Simplification and Value Analysis, 185
 - Design for Manufacturability, 186
 Concurrent Engineering, 187
 Implementing Cross-Functional Teams in DFM, 189
 - Process Design and Layout for Manufacturing and Service Systems, 190
 Projects: Processes That Don't Flow, 190
 Intermittent Flow Configurations, 190
 Line-Flow Configurations, 193
 - **Global Operations Management 5.2:**
Opel Eisenach GMBH—Creating a High-Productivity Workplace, 194
 - Cellular Manufacturing, 196
 Production Line Approach to Service, 197
 - Strategic Issues in Process Design, 198
 Product and Process Innovation, 198
 The Product-Process Matrix, 199
 Designing for the Environment, 199
 - **Operations Management in Practice 5.3:**
Merck Fights to Keep Up the Production Pace, 200
 - **Operations Management in Practice 5.4:**
ISO 14000 Standards: Ready for Launching, 202
 - **Case Study:**
Cellular Manufacturing at Electronic Hardware Corporation, 207

CHAPTER 5

Product Planning and Process Design, 172

- Introduction, 173
 Assessing Customers' Needs and Wants, 174
 Technology-Driven New Product Ideas, 174
 New Product Ideas from Market Research, 174
- **Operations Management in Practice 5.1:**
Where You Really Need to Hear Customers, 175
 - The Voice of the Customer, 175

CHAPTER 6

Long-Range Capacity Planning and Facility Location, 210

- Introduction, 211
 An Overview of Capacity Planning, 211
 The Importance of Capacity Planning, 212
 Defining and Measuring Capacity, 212
 Measuring System Effectiveness, 213
 Focused Facilities, 214
- **Operations Management in Practice 6.1:**
The Focused Factory—Another Concept for Continuous Improvements in Manufacturing, 215

- Capacity Strategies, 215
 - Capacity Cushions, 216
 - Strategic Timing of Capacity Changes, 216
 - Sizing Capacity Changes, 218
- **Operations Management in Practice 6.2:**
High Volume Production—The Key to Success, 220
- Making Capacity Planning Decisions, 220
 - Steps in the Capacity Planning Process, 221
 - Using Decision Trees in Capacity Planning, 222
- **Operations Management in Practice 6.3:**
A Plant Conversion Solves a Plant Capacity Problem, 224
- An Overview of Location Decisions, 225
 - Why Location Decisions Are Important, 225
 - Location Options, 225
 - A General Approach to Making Location Decisions, 226
- Factors Affecting Location Decisions, 227
 - Regional, Community, and Site Considerations, 227
 - Dominant Facility Location Factors in Manufacturing, 229
 - Dominant Facility Location Factors in Services, 230
- **Operations Management in Practice 6.4:**
The Charlotte Panthers Choose a Preseason Training Facility, 232
- Making the Single-Facility Location Decision, 232
 - Detailed Cost Analysis, 232
 - Factor Rating Systems, 234
 - Center of Gravity Method, 234
 - Locational Cost-Volume-Profit Analysis, 237
- Making Multiple-Facility Location Decisions, 238
 - Plant Charters Approach, 239
 - Transportation Method, 240
 - Heuristics, 242
 - Simulation, 242
 - Optimization Methods, 243
- Strategic Trends in Location Decisions, 244
 - Business Park Proliferation, 244
- **Operations Management in Practice 6.5:**
Analyzing Alternative Locations and Service Areas for the American Red Cross, 245
 - Factories: Research and Development Linkages, 246
 - Globalization of Production, 246
 - The Sun Belt Phenomenon, 249
- **Global Operations Management 6.6:**
NAFTA Opens a New World of Market Opportunities, 249

- **Global Operations Management 6.7:**
Why BMW Cruised into Spartanburg, 251
- **Case Study:**
Georgia-Pacific Corp., 259
- **Case Study:**
Pohang Iron and Steel Co., Ltd., 269



► CHAPTER 7

Managing Quality, 272

- Introduction, 273
- Quality in Historical Perspective, 273
- Quality Management as a Strategic Issue, 276
 - ISO9000 International Standards, 276
- **Operations Management in Practice 7.1:**
The Ritz-Carlton Hotel Co., 277
 - Role of Quality in Manufacturing Strategy, 278
- **Global Operations Management 7.2:**
A Global Comparison of Quality Capabilities, 279
 - Malcolm Baldrige National Quality Award, 280
- **Operations Management in Practice 7.3:**
1996 Baldrige Award Winners, 283
- Quality Management Leadership, 283
 - W. Edwards Deming, 284
 - Joseph M. Juran, 285
 - Philip B. Crosby, 285
- Definitions of Quality, 287
 - Quality as Excellence, 287
 - Quality as Conformance to Specifications, 287
 - Quality as Fitness for Use, 288
 - Quality as Value for the Price, 288
- Quality-Related Product Characteristics, 288
- Quality-Related Service Characteristics, 290
- Costs of Quality, 290
 - Classifying the Costs of Quality, 291
 - Interaction of Quality Costs, 291
- Total Quality Management, 293
 - TQM Requirements, 294
 - TQM Implementation Process, 299
 - Barriers to Implementing TQM, 300
- Business Process Reengineering, 301
- **Operations Management in Practice 7.4:**
Reengineering Taco Bell, 302
- **Case Study:**
Laying the Groundwork for Total Quality, 308



► CHAPTER 8

Technological Developments in Operations Management, 310

Introduction, 311

Role of Technology in Today's Business Environment, 312

Technology and the Environment, 313

Technology-Focused Strategic Alliances, 313

- *Operations Management in Practice 8.1: DuPont Generates Energy from Garbage*, 314

- *Global Operations Management 8.2: Japan Bids for Global Leadership in Clean Industry*, 315

Transferring New Technology from Concept to Reality, 317

Implementing New Technology, 318

Fixed, Programmable, and Flexible Automation, 320

Computer-Integrated Manufacturing, 321

Computer-Aided Design, 323

Computer-Aided Manufacturing, 323

Technological Improvements for Support, 327

Artificial Intelligence: Adaptive Technology for the '90s, 328

Virtual Reality, 329

Technological Improvements in Communications, 330

- *Operations Management in Practice 8.3: The Marvels of "Virtual Reality"*, 331

- *Global Operations Management 8.4: Motorola Plans New Satellite Ventures*, 332

- *Case Study: Pavilion Technologies*, 339



► CHAPTER 9

Organization and Human Resources, 344

Introduction, 345

Strategic Human Resources Planning, 345

Sociotechnical Organizations, 347

Adaptive Organizational Structures, 348

Keys to Worker Productivity, 349

Human Resources Issues of the 1990s and Beyond, 350

Government Regulations, 351

Work Force Diversity, 351

Manager as Leader, 351

Participative Management, 352

Team Activities, 353

- *Operations Management in Practice 9.1: Multidisciplinary Teams at Dettmers Industries*, 354

Fear in the Workplace, 355

Training and Development, 358

Benefits, Compensation, Recognition, and Reward, 360

- *Global Operations Management 9.2: Preparing U.S. Managers for Work Abroad*, 361

- *Operations Management in Practice 9.3: Linking Customer Loyalty to Compensation at Pizza Hut*, 364

The Inevitability of Change, 365

Work Measurement, 365

Time Studies, 366

Elemental Standard Times, 369

Predetermined Standard Times, 370

Learning Effects on Time Standard

Estimation, 371

The Learning Curve, 371

Uses of Learning Curve Concept, 375

SECTION FOUR

Operation Planning and Control



► CHAPTER 10

Global Supply Chain Management, 382

Introduction, 383

Supply Chain Management for Strategic Advantage, 384

Traditional Logistics Management, 385

Logistics System Components, 386

Logistics Component Integration, 387

Logistical Elements, 388

Logistics Issues, 390

Purchasing, 390