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Norman Gaither

世界财经与管理教材大系



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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

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PREFACE

The American Assembly of Collegiate Schools of Business (AACSB) requires that its accredited schools include production and operations management (POM) in their curriculum. Schools of business in growing numbers have included POM courses in their academic programs at both the undergraduate and graduate levels. This book is developed for these and other POM courses.

The seventh edition has these distinctive features:

1. A comprehensive, practical, balanced, and nontheoretical approach to POM.

The text places the student squarely in the production/operations function in a variety of situations: manufacturing and services, small businesses and large corporations, quantitative and managerial approaches, start-up and established businesses, and high-tech and traditional businesses. Many of the problems and examples in the text have been abstracted from actual situations in industry.

2. An emphasis on contemporary topics:

- **Operations strategy.** Chapter 2, Operations Strategy, introduces the student to strategic issues and motivates the study of POM by examining the forces at work today in our global economy. The framework of Chapter 2 is then applied in Part II of the text, Strategic Decisions.
- **Global competition, total quality management (TQM), and customer service.** These themes are introduced in Chapter 2. Because all facets of POM are affected by global competition, TQM, and customer service, their influences are discussed throughout the text. Chapter 17, Total Quality Management (TQM), presents the overall philosophy and methods of TQM.
- **POM in services.** Service operations are emphasized in this edition. The application of operations strategy, process planning, automation, and quality to service operations is specifically discussed. Examples, problems, and cases are cast in the setting of transportation, retailing and wholesaling, banking, and other service industries. Chapter 13, Planning and Scheduling Service Operations, addresses many of the operational decisions in services.
- **Just-in-Time (JIT) manufacturing.** Chapter 14, Just-in-Time (JIT) manufacturing, discusses the philosophy and methods of planning and controlling manufacturing operations. The ways that JIT affects such things as purchasing and materials management, personnel relations and practices, quality control, customer service, and other concepts are integrated throughout the text.
- **Advanced production technology.** Chapter 1 introduces students to automation and related concepts. Chapter 2, Operations Strategy, discusses the strategic implications of high-tech manufacturing. Chapter 5, Production Technology, discusses the types of automated machines, automated production systems, and related concepts and issues. These topics are described and illustrated from the perspective of the operations manager and how they affect the strategic performance of operations.

3. A problem-solving and decision-making approach. Each chapter includes examples of POM problems with complete solutions. These examples are solved step by step so that students can follow every detail of the solutions. A strength

of the text is its problem sets and cases, which are numerous and can be worked directly from the information in the chapters. The problems exhibit a progression of difficulty as one proceeds through a set. In a continuing effort to keep the problem sets current and effective, hundreds of new problems have been added to this edition and several of the old ones have been removed. The problems and their solutions that were removed from this and earlier editions have been placed in the *Instructor's Teaching Manual*. Chapters are presented in a framework particularly suitable for learning by students. Students can move from concepts, solved examples, odd-numbered problem assignments with the assistance of answers, and finally even-numbered problem assignments without the assistance of answers. This process builds students' understanding and confidence.

4. Features that aid learning:

- **Industry Snapshots.** Special accounts of industry applications are featured in most chapters, including new ones in the seventh edition. These Industry Snapshots are visually set apart to indicate their importance to the topics being discussed. Where possible in these narratives, the real names of companies and people and their actual situations are used to demonstrate to students the relevance of what we teach in POM courses.
- **Full-color photos and graphics.** This edition uses full-color photos to illustrate many of the concepts and methods throughout the text. Full-color charts, graphs, tables, and other visual tools are also used. Further, full color is used throughout to emphasize organization, to accentuate content, and to aid understanding.
- **Videotapes that are integrated with the text.** Video cases are included in the *Instructor's Media Manual* to coordinate chapter concepts and methods with supplied videocassettes.
- **Wrap-up: What World-Class Producers Do.** This unique feature at the end of each chapter replaces conventional summaries. The discussions apply chapter concepts to the explanations of what the world's best-managed companies are doing in globally competitive markets. By this means, the latest and most advanced thinking about structuring, analyzing, and managing production systems is integrated throughout the text.

5. Comprehensive set of supporting materials. The text continues to offer a wide range of supporting materials:

- **Twenty-one videotapes** of factory and service operations are provided to adopters of the text, and the number is growing. These tapes are in VHS format and are intended to reinforce the materials in several topic areas of the text. The *Instructor's Media Manual* suggests how these tapes may be integrated with the text and with the other ancillary materials provided. These video tapes are free to adopters of the text.
- The *Instructor's Media Manual* is a resource for instructors as they use the various modes of media presentations in class. The first part of the manual concerns the video cases found in the text. This part includes each video case with its discussion questions, teaching objectives, answers to discussion questions, and suggested quiz questions. The next part of the manual contains over 300 transparency masters. There are masters of almost every table, figure, and example in the text. Additionally, other masters are provided that supplement the materials found in the text. The manual is free to adopters of the text.
- The *Instructor's Teaching Manual: With Supplemental Problem Sets* presents a comprehensive set of materials to assist instructors in teaching the course. It

includes suggested course schedules, chapter topical outlines, chapter teaching notes, sample exams, answers to end-of-chapter review and discussion questions, and over 300 supplemental problems and their solutions. It is free to adopters of the text.

- The *Instructor's Solutions Manual* consists of complete solutions for all the problems and cases in the text. These are presented in large ORATOR type so that they can be used as transparency masters. It is free to adopters of the text.
- The *POM Computer Library* includes computer programs for solving problems and cases in the text that are geared to novice computer users. Many improvements have been made in the program to accompany the seventh edition, including new menus and ease of use. Programs for forecasting, line balancing, linear programming, queuing, inventory, MRP, quality control, CPM, and PERT are included. No manual is needed; the package is thoroughly consistent with the text; and the programs frequently refer to tables, figures, examples, and formulas in the text. This visually appealing package is IBM PC compatible, has automatic file maintenance, and allows data to be edited and stored between use sessions. Appendix C at the end of the text explains the use of the package and end-of-chapter problems. Cases that are specially designed to be solved with the use of the computer are identified by a computer symbol. This computer package is free to adopters of the text.
- The spreadsheet templates for *LOTUS® 1-2-3®* and *Microsoft Excel* comprise a library of templates for the seventh edition with over 60 spreadsheets to be used in conjunction with a spreadsheet package. The purpose of the templates is to provide a convenient and powerful tool for analyzing the quantitative examples and computer problems and cases in the text that are appropriate for a spreadsheet approach. It is free to adopters of the text.
- The *Study Guide* provides chapter outlines and review questions and problems, including answers and solutions, to help students master the text material and prepare for exams.
- The *Test Bank* includes more than 1,000 questions and problems with detailed solutions. Multiple choice questions, discussion questions, and problems are included. It is free to adopters of the text.
- The *Computerized Test Bank* includes all the questions and problems in the *Test Bank* and is provided free to adopters of the text. The package is available in disk form for the IBM PC. With this package, instructors can design their own comprehensive quizzes and examinations covering the concepts and issues presented in the text. It is free to adopters of the text.

As with the previous editions, students should have completed courses in college algebra and introductory statistics as prerequisites to courses using this text. Although the mathematical and statistical concepts in the text are not complex, students with a basic background in these topics tend to perform better.

As this edition is completed, numerous persons deserve special recognition for their contributions to the project. The many friends and associates who have contributed to both formal and informal reviews of the text manuscript deserve special recognition:

- Abe Feinberg, California State University, Northridge
- Tim Vaughan, Northern Illinois University
- Robert Boothe, University of Southern Mississippi
- Greg Frazier, University of Oregon
- Richard Lemay, Rensselaer Polytechnic Institute

- Renato de Matta, University of Iowa
- Michael Harper, University of Colorado, Denver

To those and all the other persons who have contributed to this work, I am grateful.

NORMAN GAITHER



About the Author

Norman Gaither is Professor Emeritus of Business Analysis and Research at Texas A&M University. He received his Ph.D. and M.B.A. from the University of Oklahoma and his B.S.I.E. from Oklahoma State University. Prior to teaching, Professor Gaither worked at Olin Corporation, where he held the positions of chief industrial engineer, plant manager, and director of a multiplant operations, and at B.F. Goodrich Company as senior industrial engineer.

Professor Gaither's writings on a wide range of POM topics have appeared in *Management Science*, *Decision Sciences*, *International Journal of Production Research*, *Journal of Production and Inventory Management*, *Academy of Management Journal*, *Academy of Management Review*, *Simulation*, *Journal of Purchasing and*

Materials Management, *Journal of Operations Management*, *IIE Transactions*, *Journal of Cost Analysis*, and *International Journal of Operations and Production Management*.

He serves on the editorial boards of the *Journal of Production and Inventory Management*, the journal of the American Production and Inventory Control Society (APICS), the *International Journal of Production Research*, *Production and Operations Management*, the journal of the Production and Operations Management Society (POMS), and the *Journal of Operations Management*, the journal of the Operations Management Association (OMA). He is an AACSB Federal Faculty Fellow.

Professor Gaither remains active in the affairs of production and operations management in government and industry and in several professional societies.

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