

Quantitative Approaches to Management

E I G H T H E D I T I O N

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Quantitative Approaches to Management

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PREFACE

When our first edition of *Quantitative Approaches to Management* was published, there were only three textbooks in what we now call MS/OR. In 1992, as we present our eighth edition, there are about forty. We believe our book offers teachers and students an outstanding choice and the best teaching-learning aid available today. Here is why we believe this is true:

We Keep Our Book Current

Each time we write a new edition of *Quantitative Approaches to Management*, we introduce new topics, new learning aids, new ways to solve problems, and new ways to apply MS/OR approaches. For this edition here are some of the changes we've made:

- The discussion of linear programming and its accompanying techniques has been expanded beyond the significant increase in the last edition.
- Computer approaches to solving MS/OR problems are found in every chapter except the introductory chapter and the final chapter.
- The material on integer programming has been completely revised and includes an extensive discussion of integer programming formulations.
- LOTUS spreadsheet models appear in most chapters; the worksheet files for applying these are included on the diskette available with the book.
- An ongoing real-world case is part of most of the chapters; here we demonstrate some of the problems a young MS/OR consultant has as she applies these techniques to problems in client companies.
- We have added new sections on decision support systems and artificial intelligence and expert systems to the introductory chapter.
- The end-of-chapter quizzes have been revised and the number of items in each of them increased significantly.
- The number of end-of-chapter exercises has been increased; almost one-quarter of these are new with this edition.

Our Book Covers More MS/OR Topics

This edition covers more MS/OR topics than any other textbook currently available. Each of these topics is treated in some detail including computer-based applications, end-of-chapter quiz items, end-of-chapter exercises, and examples of real-world applications. The wider set of topics gives instructors much more flexibility in designing MS/OR courses of different lengths, or related sets of courses.

Our Book Bridges Theory and Successful Application

We are able to do this because of the significant MS/OR work experience of the authors. One of our authors is a widely recognized authority in forecasting and spreadsheet applications; another is a well known researcher in mathematical programming application problems; still another has spent his professional career designing pedagogical teaching aids for MS/OR. One of our authors has spent more than thirty years designing MS/OR applications for firms around the world. This unique team brings a special combination of talent, focus, and experience to the teaching of MS/OR. Each of them leaves a very strong mark on this edition, and together they make it very teachable, very easy to learn from, very highly applied, and very computer-solution oriented.

This Edition Has the Most Comprehensive Set of Pedagogical Aids that Has Ever Been Assembled in an MS/OR Text

Here are just some of the things that make teaching and learning more effective with this book:

- The size format of the book has been significantly increased.
- There are more than 2,000 margin notes in color.
- Two colors are used to present ideas and emphasize important concepts.
- Each chapter has a glossary of terms.
- An annotated review of equations used is part of each chapter.
- End-of-chapter quizzes are an important part of each chapter.
- Learning objectives for each chapter are spelled out at the beginning.
- Each chapter begins with a photographically presented MS/OR opportunity, which is discussed in detail and solved later in the chapter.
- Most of the chapters contain LOTUS spreadsheet models, especially designed for the material in that chapter.
- A real-world successful application of MS/OR is discussed at the end of each chapter; special attention is paid to the problem environment, the constraints that were present, and the economic benefit that was achieved.
- A comprehensive instructor's manual is available.
- A student workbook and study guide are available.
- A test bank with worked-out answers is available.
- An index of applications is available, which makes it possible to locate an

application of MS/OR in almost any area of organized activity, both profit and not-for-profit.

- Each chapter has a computer-applications case with a data base; this allows students to practice applying the computer models in that chapter.

This Book Has a Strong Computer Focus

The computer diskette available with this book contains the software to generate solutions using linear programming and all of its accompanying techniques. The worksheet files for the LOTUS spreadsheet models are also available on the diskette. Together, these two approaches cover every technique introduced in the book. Computer-generated solutions are presented for most of the techniques presented in the book, and each of these solutions is discussed in detail at the point at which it is introduced. We provide exercises which can be worked using manual solutions (pencil symbol); we include some exercises which require a bit of pencil work before they can be solved with a computer (computer and pencil symbols together); and we include exercises which can be worked completely with a computer (computer symbol).

Our Text Won't Confuse or Intimidate Students with a Modest Mathematical Background

At the time of its first edition, over twenty-five years ago, this was the only book available which let students with a modest math background understand how MS/OR affects our lives. This edition continues that tradition which has now won the approval of thousands of instructors and nearly a million students.

Writing a new edition involves many more people than just the four authors, and it is this group of tireless contributors who deserve most of the credit for this new edition. Among those folks who have helped are: James L. Boettler, South Carolina State College; Willard G. Connor, Robert Morris College; John Durham, Fort Hays State University; Frank G. Forst, Loyola University of Chicago; John R. Pickett, Georgia Southern University; and Justin Stolten, University of Nebraska at Omaha.

A very special thank-you goes to Frank Burrows, our editor, whose keen sense of publishing has guided this revision. And very special kudos to Ira Roberts, who, as everybody involved with the book knows, really runs the whole process.

Our warmest thanks and appreciation go to Barbara Hoopes, whose alter-ego, Mikaila Stevens, has added an important new dimension to this edition.

Finally for all those folks who have adopted past editions of our book and to all those teachers who have sent in suggestions and corrections, we are greatly indebted. Without you, we could not produce this edition. The four of us hope you enjoy what we've produced together!

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EVERETTE S. GARDNER, JR.

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