



# Marketing Engineering: Computer-Assisted Marketing Analysis and Planning (2nd Edition)

By Gary L. Lilien, Arvind Rangaswamy

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### Editorial Review

#### About the Author

**Gary L. Liken**, who coined the term *marketing engineering*, is Distinguished Research Professor of Management Science at the Smeal College of Business at Penn State. He is also co-founder and Research Director of the Institute for the Study of Business Markets at Penn State, an organization aimed at fostering research and interchange in nonconsumer markets. He holds three degrees in operations research, from the School of Engineering at Columbia University. Previously, Prof. Liken was a member of the faculty at the Sloan School at MIT. His research interests are in marketing engineering, market segmentation, new product modeling, marketing-mix issues for business products, bargaining and negotiations, modeling the industrial-buying process and innovation-diffusion modeling.

Prof. Lilien is the author or co-author of 12 books (including *Marketing Models* with Philip Kotler) and over 80 professional articles. He was Departmental Editor for Marketing for Management Science; is on the editorial board of the *International Journal for Research in Marketing* and the *Journal of Business to Business Marketing*; is Functional Editor for *Marketing for Interfaces*, and is Area Editor for *Marketing Science*. He is former Editor in Chief of *Interfaces*. He served as President as well as Vice President/Publications for the Institute of Management Sciences. He is U.S. Coordinator for the European Marketing Academy.

Prof. Liken is a winner of the Alpha Kappa Psi award for the outstanding article in the *Journal of Marketing* and is the Philip M. Morse Distinguished Lecturer of the Institute for Operations Research and the Management Sciences (INFORMS), 2001-2003. He received honorary doctorates from the University of Liege, the University of Ghent, and Aston University.

Prof. Lilien's consulting clients include AT&T, DuPont, Exelon, the Federal Reserve Bank, Hewlett-Packard, IBM, Kodak, Pillsbury, PP&L, Sprint, 3M, and Xerox.

Prof. Liken is three-time winner and seven-time finalist in the Penn State Squash Club Championship and has substantial collections of fine wines and unusual porcine objects.

**Arvind Rangaswamy** is the Jonas H. Anchel Professor of Marketing at Penn State, where he is also co-founder and Research Director of the eBusiness Research Center. He received a PhD in marketing from Northwestern University, an MBA from the Indian Institute of Management, Calcutta, and a B.Tech from the Indian Institute of Technology, Madras. Before joining Penn State, he was a faculty member at the J. L. Kellogg Graduate School of Management, Northwestern University, and at the Wharton School, University of Pennsylvania. He is actively engaged in research to develop concepts, methods, and models to improve the efficiency and effectiveness of marketing using information technologies, including such topics as marketing modeling, online customer behavior, and online negotiations.

Prof. Rangaswamy has published numerous articles in such leading journals as *Marketing Science*, the *Journal of Marketing Research*, *Management Science*, the *Journal of Marketing*, the *International Journal of Research in Marketing*, *Marketing Letters*, *Psychometrika*, *Multivariate Behavioral Research*, and the *Journal of Economics and Statistics*. He is Area Editor for *Marketing Science* and serves on the editorial boards of the *Journal of Interactive Marketing*, the *International Journal of Intelligent Systems in Accounting, Finance and Management*, the *Journal of Service Research*, and the *Journal of Business-to-*

## *Business Marketing.*

Prof. Rangaswamy is a Fellow of the IC<sup>2</sup> Institute, an IBM Faculty Partner, and the Chair of the e-Business Section of the Institute for Operations Research and the Management Sciences (INFORMS). He is the Program Director for Electronic Markets and Marketing Information Systems and a member of the Advisory Board at Penn State's Institute for the Study of Business Markets.

Prof. Rangaswamy has consulted for a number of companies including Marriott, Xerox, IBM, Kodak, Nokia, PPG Industries, AT&T, TVS (India), Bristol-Myers Squibb, Walker Digital, and Peapod.

Prof. Rangaswamy is an avid and successful trader on eBay and other auctions, where he blends his research with his personal interest in rare Indian stamps and postal history.

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Several forces are transforming the structure and content of the marketing manager's job. As a profession, marketing is evolving. It is no longer based primarily on conceptual content. Marketing resembles design engineering—it consists of putting together data, models, analyses, and computer simulations to learn about the marketplace and to design effective marketing plans. While many view traditional marketing as art and some view it as science, the new marketing increasingly looks like engineering (that is, combining art and science to solve specific problems). Our purpose in writing this book is to help educate and train a new generation of marketing managers.

Several key forces are changing the marketer's job:

- *Pervasive high-powered personal computers on networks:* During the 1980s marketing managers used personal computers mainly for such tasks as composing letters and presentations and doing simple spreadsheet analyses. Today many marketing managers have the equivalent of an early supercomputer on their desks. And that computer is networked to other PCs and to the company's mainframe on a local area network (LAN), and to external computers and databases all over the world through the Internet. This means that a marketing manager can access current data, reports, and expert opinions, and he or she can also combine and process that information in new ways to enhance decision making. Today basing decisions on such information is a minimum requirement to be a player in many industries.
- *Exploding volumes of data:* A brand manager in the packaged goods industry now sees perhaps a thousand times the volume of data (more frequently collected in finer detail) he or she saw five years ago. The growth of e-commerce, database marketing and direct marketing parallels data explosions in other industries as well. The human brain, however, has not become comparably more powerful in the same period. More data cannot lead to better decision making unless managers learn how to use that data in meaningful ways. If data are a burden, then insights provide relief.
- *Reengineering marketing activities:* All over the world organizations face increasingly well-informed customers who seek value. As a result they are carefully scrutinizing the productivity of all management processes. To reduce their costs and to improve productivity, they are reengineering many marketing functions, processes, and activities. They are reengineering such activities as segmentation and targeting, new product development, market measurement and analysis, and customer satisfaction management for the information age.
- *Flatter, right-sized organizations:* Organizations could respond effectively to the aforementioned trends using traditional organizational mechanisms if they trained an army of specialists to harness computer hardware, software, networks, and data. They do not have that luxury. Global competition is driving organizations everywhere to do more with fewer employees. Managers are finding themselves empowered (i.e., without support staff): they have the hardware, software, and data at their desks and are expected to

use them, operating independently.

Marketing managers must learn to function in the rapidly changing environment and to exploit evolving trends. Firms and business schools can help marketing managers to cope in two ways. They can offer traditional, concept-based education and training, with the hope that good people will figure out on their own how to cope with the changing environment. The education-as-usual approach will always have some success—well-motivated and intelligent marketers will figure out how to get reasonable value from the new resources. This approach is analogous to lecturing golf novices on the rules and giving them golf clubs and self-training books. Through study, networking, and observing successful golfers, some novices will become pretty good golfers. Others will become duffers. Still others will quit the game because it seems too hard. The lack of formal training limits development.

Those who want to excel need lessons, especially early on. Hence another way to help marketing managers respond to the changes is to provide information-age-specific education and training. There will always be an important role for marketing concepts, and using the powerful information tools now available requires sound conceptual grounding. But marketers need much more than concepts to fully exploit the resources available to them. They need to move from conceptual marketing to marketing engineering: *using computer decision models in making marketing decisions*. In this book we integrate concepts, analytic marketing techniques, and operational software to train the new generation of marketers, helping them to become marketing engineers.

## OBJECTIVES FOR THE STUDENT

We designed this book for you, the business school student or marketing manager, who seeks the education you need to perform effectively in information-technology-intensive environments. Most traditional books focus on marketing from conceptual, empirical, or qualitative perspectives. With this book we aim to train marketing engineers to translate concepts into context-specific operational decisions and actions using analytical, quantitative, and computer modeling techniques. We link theory to practice and practice to theory.

Our specific objectives for the book are

- To help you gain an understanding of the role of analytical techniques and computer models for enhancing marketing decision making in modern enterprises
- To improve your skills in viewing marketing processes and relationships systematically and analytically
- To expose you to a number of examples demonstrating the value of marketing engineering in real managerial contexts
- To provide you with a software toolkit, a companion product of this book, that will enable you to apply marketing engineering to real marketing decision problems

Our pedagogical philosophy embraces two main principles: *learning by doing* and *end-user modeling*. Most of the concepts we describe have software implementation and at least one problem or case you can resolve by using the software. You may make errors and struggle at times, attempting to apply the tools. That is part of the learning-by-doing process; you will learn what the tools and software can do as well as what they cannot do. Traditional methods of teaching in business schools (i.e., lectures and case analyses) do not go far enough in helping students to make decisions, assess risks, and solve problems. The learning-by-doing approach extends traditional marketing education. With model-based tools for decision making, you can learn to anticipate and deal with the potential consequences of your decisions—this will help you improve your strategic thinking, sensitize you to customer needs, force you to anticipate competitive moves, and develop implementation plans. In short, you should not only learn to improve how you make marketing decisions, but also how to derive the maximum benefits from your decisions.

Decision models range from large-scale, enterprise-wide applications to those that can be quickly put together by an individual with an understanding of basic marketing and marketing engineering. We emphasize end-user modeling here. End-user modeling has the characteristics of good engineering: do as good a job as you can with the time and resources you have available.

Good end-user modeling provides direct benefits, permits rapid prototyping for more elaborate approaches, and makes the user a better customer (and critic) of larger, enterprise-wide applications. We are not trying to train you to be a technical specialist. Rather we hope to prepare you to put together technically simple but operationally useful decision models and to become astute users of those models and of the results of models that others have developed.

## **NEW FOR THE SECOND EDITION**

The first edition of Marketing Engineering, published four years ago, had as its objective to provide the background and tools needed to train information-age marketers. Our aim was to help marketing students move from conceptual marketing to marketing engineering—to access and use computer decision models when making marketing decisions. As such, that edition combined 26 different software tools with a two-volume book and tutorial package that implemented our pedagogical philosophy: learning by doing and end-user modeling.

The positive (and negative feedback) associated with the first edition has lead to this second edition. Reviews of the concepts and the tools that we included were very positive. Hence, while we have updated the material and the references, we have changed very little of the core of the book, either in terms of the basic textual material or in terms of specific implementations of our software.

Criticisms of the book were mainly associated with

- Its high price, necessitated by the breadth of the ME package—two volumes, CDROM, 26 software packages, instructor's manual, videotapes, and web site;
- The difficulty and complexity of getting the latest software distributed and working on different systems; and ,
- The limited set of data sets/cases for classroom use.

This second edition addresses these concerns by a redesign of the ME package to be accessible through the Internet. While a single softcover textbook remains, there is no longer a CD-ROM or a tutorial volume included with the text. Cases and exercises have been integrated into the single volume; tutorials (and other electronic components of the text) are now available on the Internet at [www.mktgeng.com](http://www.mktgeng.com).

Adopters have three options for accessing the software:

1. The latest version of the software will be available to book adopters for free for a year on the Internet (but will require the current versions of Windows and Excel to run).
2. Academic adopters can have a version installed and made available on a local area network to speed up response time.
3. For most rapid response, individuals can purchase, download and run the software locally, without the need for an Internet connection. (This version will support versions of Excel 7 and later under Windows 95 and later.)

Thus, in this second edition, we have:

- Revised the text, with corrections, and enhancements and combined the text with the cases into a single

volume. Made the software available separately from the book with access options as noted above. Made enhancements to several of the most frequently used software modules.

## **ORGANIZATION**

The text for the second edition is organized as follows:

- In Part 1 (Chapters 1 and 2) we introduce and define marketing engineering and develop key marketing engineering building blocks-market response models.
- In Part 2 (Chapters 3 through 6) we focus on strategic marketing issues such as segmentation, targeting, positioning, market selection, portfolio analysis, market measurement, and strategic planning.
- In Part 3 (Chapters 7 through 10) we address tactical marketing issues such as product design, advertising and communications, salesforce deployment, outlet location, and price and promotion decisions.
- In Part 4 (Chapter 11) we conclude, summarizing some key points and highlighting new developments that are driving the future of marketing engineering.

Each chapter also contains cases and problem sets that are keyed to the major concepts. We have also created a Web site, [www.mktgeng.com](http://www.mktgeng.com), to provide the software for running the models described in the book. The Web site contains tutorials, help files, tips and other resources for using our software and for deriving the maximum benefits from marketing engineering. We update this site frequently to ensure that you will always have access to the latest software and accompanying resources.

In addition, instructors who adopt the book receive videotapes that highlight award-winning marketing engineering applications and the impact that those applications have had at the following firms:

- ABB Electric (the profitable use of choice-based segmentation)
- Marriott Hotels (the use of conjoint analysis to design the Courtyard by Marriott hotel)
- ASSESSOR (the use of the ASSESSOR pretest market model and procedure at hundreds of firms)
- AT&T (the use of systematic copy testing to develop AT&T's cost-of-visit advertising campaign)
- Syntex Labs (the use of judgmental response functions to size and allocate a sales-force)
- American Airlines (the use of a yield management system to increase profits)

## **USES OF THE BOOK FOR INSTRUCTORS**

We designed this book primarily as a text for a one-semester, capstone MBA course. Students need not have strong backgrounds in quantitative methods; however, it will be helpful if they have some quantitative and marketing background and some facility with microcomputers and related (Windows-based) software. We have used the material successfully in executive programs and in undergraduate classes as well.

As there are 26 software modules (each with a different focus), the book includes twice as much material as can be covered in a normal one-semester course. The software and related problems should be viewed as a menu; students need not use all the software to gain benefits from the material. Indeed we find that students can readily absorb only 6 to 10 modules in a semester. For shorter courses and executive programs, you should make a much more limited selection.

Many of the software modules are intended for general use (i.e., not just for the problem set provided); they can be used for term projects that can provide a very valuable learning experience.

Many of us recognize that reading textbooks or listening to lectures is not the best way to learn marketing decision making. Instead, students should experience marketing in a way that leaves behind enduring lessons. Therefore, the best way for students to learn marketing engineering is to encourage them to use the

software, to do the problems, and cases.

The software empowers students to solve marketing problems. We find that classes work best when we keep-lectures to a minimum and have one or two student groups present their problem analyses to the rest of the class, which acts as (skeptical) management. This follows the learning-by-doing philosophy and makes students responsible for their own learning. It also simulates how marketing engineering works in the real world.

## Users Review

### From reader reviews:

#### **Paul Erdmann:**

This Marketing Engineering: Computer-Assisted Marketing Analysis and Planning (2nd Edition) are reliable for you who want to certainly be a successful person, why. The reason why of this Marketing Engineering: Computer-Assisted Marketing Analysis and Planning (2nd Edition) can be one of many great books you must have is actually giving you more than just simple looking at food but feed an individual with information that probably will shock your before knowledge. This book is usually handy, you can bring it everywhere you go and whenever your conditions at e-book and printed kinds. Beside that this Marketing Engineering: Computer-Assisted Marketing Analysis and Planning (2nd Edition) giving you an enormous of experience such as rich vocabulary, giving you tryout of critical thinking that we all know it useful in your day activity. So , let's have it and enjoy reading.

#### **Patricia Whitmore:**

This book untitled Marketing Engineering: Computer-Assisted Marketing Analysis and Planning (2nd Edition) to be one of several books that will best seller in this year, this is because when you read this book you can get a lot of benefit in it. You will easily to buy this particular book in the book retail store or you can order it via online. The publisher on this book sells the e-book too. It makes you more easily to read this book, since you can read this book in your Cell phone. So there is no reason for you to past this e-book from your list.

#### **Carmen Russell:**

Playing with family in a very park, coming to see the sea world or hanging out with pals is thing that usually you could have done when you have spare time, then why you don't try factor that really opposite from that. A single activity that make you not experiencing tired but still relaxing, trilling like on roller coaster you are ride on and with addition of information. Even you love Marketing Engineering: Computer-Assisted Marketing Analysis and Planning (2nd Edition), you could enjoy both. It is very good combination right, you still need to miss it? What kind of hang type is it? Oh come on its mind hangout people. What? Still don't get it, oh come on its known as reading friends.

**Barbara Bell:**

As a college student exactly feel bored in order to reading. If their teacher expected them to go to the library or to make summary for some publication, they are complained. Just minor students that has reading's internal or real their hobby. They just do what the teacher want, like asked to go to the library. They go to at this time there but nothing reading critically. Any students feel that reading is not important, boring along with can't see colorful photos on there. Yeah, it is to be complicated. Book is very important for you personally. As we know that on this age, many ways to get whatever we really wish for. Likewise word says, ways to reach Chinese's country. Therefore , this Marketing Engineering: Computer-Assisted Marketing Analysis and Planning (2nd Edition) can make you feel more interested to read.

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