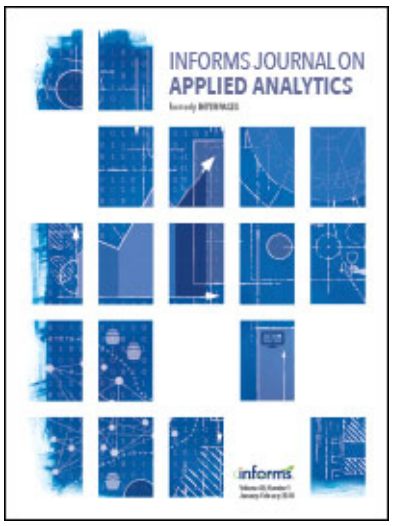

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Book Reviews

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Book Reviews

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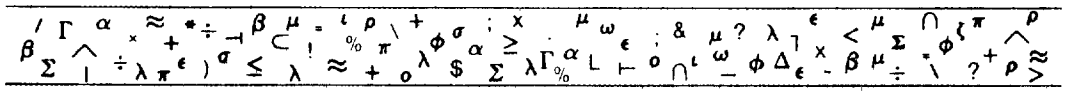

The range of books reviewed is wide, covering theory and applications in operations research, statistics, econometrics, mathematics, computers, and information systems (no software is reviewed). In addition, we include books in other fields that emphasize technical applications. Publishers who wish to have their books and proceedings reviewed should send them to Professor Benjamin Lev, Department of Management, Worcester Polytechnic Institute, Worcester, MA 01609. We list the books and proceedings received; not all books received can be reviewed because space and time are limited. Those who would like to review books are urged to send me their names, addresses, and specific areas of expertise. We commission all reviews and do not accept unsolicited book reviews. Readers are encouraged to suggest books that might be reviewed or to ask publishers to send me copies of such books.

PONDY, LOUIS R.; BOLAND, RICHARD J., JR.; AND THOMAS, HOWARD, EDS. 1988, *Managing Ambiguity and Change*, John Wiley and Sons, New York, 205 pp., $39.95.

The task of managing change and ambiguity under conditions of uncertainty is central to the effective functioning of complex organizations and is a task that is now receiving well-deserved attention from scholars in the behavioral and management sciences. This collection of essays is a welcomed addition to the literature, for its contributors bring some new ideas and analyses to such questions as how can a manager build an organization when products, markets, technologies, and professional rules are changing? How do prevalent models and metaphors of organizational functioning limit discourse and improvements in management practice? And what alternatives exist for designing organizations to cope with environments fraught with uncertainty, transition, and confusion?

The first five chapters of the book

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illuminate some conceptual issues of managing amid ambiguity and change. Chapter 1 presents cognitive, behavioral, and organizational qualities associated with handling poorly defined administrative problems effectively. These include enlarging one's "mental map," recognizing strategic problem areas, knowing when (not) to exercise control, employing well-informed and well-positioned groups and temporary structures, and planning for the future with general directions — rather than specific goals — in mind. Chapter 2 reviews how metaphor has been used historically in scientific problem solving and describes the results of a study demonstrating how the recognition of organizational problems and the solutions to them (for example, too much decentralization) were determined by the metaphors imposed (for example, bureaucracy or mechanistic organization) on decision makers.

Chapter 4 offers strategic planning as an example of an ambiguous decision situation; "the problem" for which a solution is sought is not always obvious or unequivocally defined. Thus, decision makers will be aided by techniques (for example, brainstorming, or dialectic inquiry) that improve their ability to formulate problems accurately before conducting decision analyses. In Chapter 3, however, the appropriateness of logical, linear, and rational models of decision making for describing real management problem-solving behavior under conditions of ambiguity is questioned. Proposed instead are models emphasizing incrementalism, where "dynamic interweaving of thought and action" occurs, and partial gains and continual developments improve managers' understanding of problems and solutions.

Chapter 5 advances the argument that some mechanisms for coping with ambiguity and change (for example, dialectic debate around policy alternatives) emerge as natural byproducts of political behavior in organizations; furthermore, political debate may generate and solidify commitment to potential choices. Managers can channel political diversity into coordinated decision making by utilizing routinized decision cycles, which supply specific and limited — but recurring and predictable — opportunities for dissent and debate.

In Part 2, three chapters suggest different strategies and tactics for managing ambiguity and change in organizations. One approach is to do nothing, to conduct business-as-usual (Chapter 9). Administrators facing unpredictable environments were found to employ strategies not significantly different from those used by their counterparts facing predictable environments. Conversely, administrators can recognize that changed environments may require particular decisions to be reexamined and implementation plans to be reworked. The case study in Chapter 10 illustrates this nicely. Chapter 8 describes the actions of a group of high-technology firms that helped increase product and process innovation; these included removing line management from the evaluation and funding process for proposed innovations, accommodating different clients through flexible product designs, controlling pilot studies, and allocating time for organization and

client learning.

In Chapter 6, a case study highlights two predominant approaches to the study of organizational culture, although a third perspective — where culture is viewed as a web of connected concerns — is proposed to better represent the ambiguity experienced by members of organizations undergoing traumatic changes, such as those associated with an unexpected merger. In Chapter 7, a model is presented of the process by which issues gain decision makers' attention in organizations and become part of the organization's agenda for action.

This book is provocative reading for researchers in the management and organization sciences, particularly those interested in change management and organization-environment adaptation processes. The collection is less accessible to practicing managers — with the exceptions of Chapters 1 and 8 — though the ideas contained in it most surely are relevant to their jobs.

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PANKO, RAYMOND R. 1988, *End User Computing: Management, Applications, and Technology*, John Wiley and Sons, 747 pp., $32.00.

This book covers a broad range of applications, such as personal computing, decision support systems (DSS), executive information systems (EIS), office automation, time-shared data, work-station-host data communications, and local area networks (LAN).

The author argues that the book provides a comprehensive understanding of end user computing (EUC) and its management in contrast to existing books, which offer only a scattered understanding of EUC applications. In fact, the book is well written and easy to understand. It covers every aspect of information technology and management. The review questions and references at the end of chapters are useful for an inquisitive reader.

Traditionally, EUC is covered as a chapter in a typical management information systems (MIS) book. In an attempt to differentiate this book from MIS books, Panko has selected a new title and included a variety of computer-related topics. Nevertheless, the book covers the usual MIS topics, including DSS or EIS, hardware, and software. It also contains some technical details which seem to be beyond the typical end user's interests.

While the book claims to be a text book, it includes some information not conventionally included in MIS textbooks; but common in magazines (coverage on pricing, for example). Since prices in the computer industry change frequently, this section may not provide much help to end users. Many computer magazines provide current computer and peripheral prices.

The target audience is not clearly defined. The structure of the book should appeal to academics while some parts should appeal to practitioners. In an effort to satisfy both groups, the author included chapters for each; however, the success of this effort is questionable.

A similar confusion exists with regard

to the levels of users. Is the book for novice or advanced users? It is intended for both groups. However, it may not serve either well.

Given its coverage and its references to mostly professional journals and magazines, the book is more suitable for end users in nonacademic environments. It is a good source for information systems professionals and end users who would like to learn about various aspects of computer technology and information systems management. For the former, it offers details on building and managing information centers, on office automation, and on networking applications. For the latter, it provides a broad spectrum of topics from which to select. The book presents basic information on a host of computing products, including software for word processing, spreadsheet analysis, data-base management, financial analysis, statistical analysis, electronic mails, and computer linkages.

For the end user, the major challenge is to choose a system (hardware or software) by comparing various systems' functionality and their likelihood of rapid obsolescence.

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OHNO, TAIICHI 1988, *Toyota Production System: Beyond Large Scale Production*, Productivity Press, Cambridge, Massachusetts, 145 pp., $39.95.

If there were a Nobel Prize for management innovation, Taiichi Ohno would perhaps be a prime candidate. A former executive of Toyota Motor Company, he initiated the manufacturing system referred to in the book's title but popularly known nowadays as just-in-time or JIT. There is now a growing realization among economists that it is JIT, specifically, that gave Japanese machinery and equipment makers their vaunted competitive edge during the past two decades.

This book was first published in Japanese in 1978 at the time of Ohno's retirement from Toyota. By then he had spent nearly his entire career initiating, developing, and extending JIT within Toyota's ambit and had even seen it successfully tested under the stringent conditions of the Post-OPEC (1973) industrial environment. The only comparable works of a capstone type that come to mind are those of Henry Ford and GM's Alfred P. Sloan.

This slim volume consists of six chapters which outline the concept of JIT and acknowledge the influence of Toyota's top management and Henry Ford's ideas on Ohno's thinking. As a concept, JIT is basically simple. The goal is to organize and control manufacturing so that discrete products flow through to the customer only on demand without inventory accumulation. But its implementation places a premium on the will to manage patiently and persistently over the long term.

The book also contains Ohno's (translated) post-script to the 1978 edition, the publisher's foreword to the present edition, a glossary of key terms, and a schematic diagram of the historical development of JIT in Toyota. If this diagram had been explicitly keyed to the relevant pages in the text, the chronological

picture of this important innovation would have been somewhat clearer.

Considering that Ohno is dealing primarily with shop floor practices rather than corporate office matters, the book is written in very plain language. The book is structured neither as a historical nor a comparative treatment but is a fine blend of both. It consists of a series of reflective passages or homilies, averaging about two pages each, which may be characteristic of Japanese top management writing. This structure seems consistent, however, with Ohno's aim of presenting JIT as a management system rather than as a technical one. A philosophical approach helps to gain acceptance for a simple but radical idea, such as JIT, which requires a long-term management commitment.

The book should serve readily as a touchstone for both academic and practical work in the field of the new industrial management. The introductory pages refer to Ohno's current emphasis on "management of the time line," an extension of JIT that deftly keeps the concept — and the book — evergreen.

This book should also be required reading for bureaucrats in the Third World who are responsible for formulating and implementing industrial policy. Ohno shows how shop floor practices can be congruent not only with corporate strategy but, more important, with national goals of economic development as well. Time sensitive management may prove of immense value to the long-suffering consumers in these poor countries.

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AHITUV, NIV AND BERMAN, ODED

1988, *Operations Management of Distributed Service Networks*, Plenum Press, New York, 293 pp., $59.50.

This book, a volume in the Applications of Modern Technology in Business Series, attempts to tie together some of the planning issues in distributed service networks. The authors consider a network-based service system with fixed service facilities or mobile servers or both, and randomly occurring customer demands arising from the nodes of the network. Spatially distributed service systems of this type include public emergency services (police, fire, ambulance), public health clinics, maintenance and repair services, road services, and public and private transportation services. The authors describe a number of different planning problems for such systems and present basic operations research models of the problems. The book is aimed at practitioners who have some knowledge of operations research as well as academics.

The authors have chosen a somewhat eclectic mix of topics to cover, reflecting their own research interests to a certain extent: the references for nine out of the 10 chapters include at least one article by Berman or Ahituv, with an average of one-third of the citations referencing the authors' work. One surprising omission is discussion of general routing and scheduling problems; this topic seems central to distributed service systems such as transportation and delivery services. The authors do deal with patrol routing: for that specific problem, the objective is to determine a patrol route between two

different points which visits a specified number of nodes (or which is less than a maximum allowable length) such that expected response time to a randomly occurring call is minimized. However, the book does not deal with other, more general routing problems such as transportation service problems which involve pickups and deliveries. This seems to imply that the service system paradigm that the authors are considering assumes that for the case of a mobile server, calls are answered singly.

Most of the material has been well organized using a top-down approach, starting with long-range planning issues, and then covering medium- and short-term decisions. The long-term problems considered are zoning and facility location. Chapter 2 deals with zoning (how to divide a network into semi-autonomous zones). A heuristic approach that accounts for factors such as equity of service, spatial contiguity, and compactness is presented. Chapter 3 covers four basic facility location models (median, center, set-covering, and stochastic queue median).

Chapter 4 covers a variety of resource allocation problems, which are classified as medium-range planning issues. Topics covered include telephone staffing, service station staffing, allocation of servers among service stations, and use of backup servers.

Chapters 5 through 7 consider short-term planning problems. In Chapter 5, the authors consider dispatching policies for congested and noncongested service systems, and for cooperating versus non-cooperating servers. Chapter 6 deals with real-time server repositioning in response to changes in travel times (for example, rush hour traffic) or server congestion (for example, peak demand hours). Patrol routing issues are considered in Chapter 7. The authors develop two models for determining appropriate patrol patterns.

Chapters 8 through 10 deal with topics that do not exactly fit into the authors' long-term to short-term decision framework. Chapter 8 considers information systems for dispatching. For three different levels of knowledge about vehicle status (for example, home base availability only versus real-time location data), the authors develop models of systemwide expected response time. Chapters 9 and 10 discuss cooperation between independent service networks. Models of expected response time under different policies of cooperation are developed.

In each chapter, the authors start with an introductory description of the problem, work through a simple example, and then present the mathematics underlying the example analysis. This makes the book fairly easy to follow, as one can skip over the technical sections. The exposition is clear, and the book is written in a friendly, personal tone.

For academic researchers, the book may be useful as an introduction to different models of such systems, particularly if the reader is not familiar with the work of Berman and Ahituv. I learned about a number of new models in reading the book. However, the book does not appear to be intended for classroom use, as it contains no problems for the reader to solve.

Although the range of topics covered is not exhaustive, the book may be useful

for practitioners who wish to become familiar with the types of problems encountered in distributed service systems and to learn about operations research models of those problems. On the whole, the models are fairly basic, although some of the models are more complicated than a practitioner would probably use: for example, the model of patrol routing in Chapter 7 involves integration of functions along the links of the network to calculate expected response time, and then solution by dynamic programming to determine the response time minimizing route. Another drawback for practitioners is that the book does not present any case studies illustrating the use of the methods in practice. This would make a good topic for a second volume.

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WEISS, H. J. AND GERSHON, M. E. 1989, *Production and Operations Management*, Allyn and Bacon, Needham Heights, Massachusetts, 798 pp., $46.00.

Weiss and Gershon look at decisions in operations management as they relate to supply and demand. In the first part of this book, they introduce capacity planning (which determines supply) and forecasting (which measures demand). In the second part, they discuss means of modifying capacity, including facility location, operations networks, transportation methods, facility layout, waiting lines, and job design. In part three, they explore methods to utilize capacity efficiently. This part includes such topics as project management, linear programming, aggregate planning, inventory, MRP, scheduling, and quality control.

This book has several strengths critical to an introductory textbook in this field. First, the authors explain the mechanics of different techniques well. They highlight step-by-step procedures to solve each type of problem and use graphs and tables extensively to explain concepts and to provide summaries of different models. The book is punctuated with interesting and colorful photographs, which make the techniques come alive.

Second, the authors give many examples to illustrate each technique. This is vital in acquainting students with different procedures and methods. Moreover, they provide many homework problems, most of them short and precise.

Third, concise questions are listed at the end of each chapter. These questions are useful in summarizing the chapters and strengthening the students' understanding of the techniques discussed.

Some aspects of Weiss and Gershon's book may be problematic for potential adopters. For example, some of the different techniques need to be more carefully clarified, compared, and centered. In this book, most techniques are illustrated as distinct methods and the relationships between different techniques are usually left unexplained. For instance, in the section on aggregate planning, the authors do not discuss the relationship between work-force decision frameworks and the other methods covered in the same chapter. Another case: the authors assert that linear programming is a more general and useful method than the transporta-

tion method but only illustrate this with an example. In discussing pull versus push systems, the authors describe the pull system as similar to MRP (p. 244). This statement is misleading since the underlying philosophy of MRP is actually a push system. In discussing scheduling, they make no distinction between job shops and flow shops. In discussing two-machine and three-machine job-shop scheduling, all the examples they use are actually drawn from the flow-shop environment.

In addition, some of the important recent developments in P/OM (for example, computer-integrated manufacturing (CIM), group technology, cellular manufacturing, and optimized production technique (OPT)) are not mentioned. The simplex method is discussed extensively while the coverage of Karmarkar's method is only limited to an excerpt from *Time* magazine.

At places, the book could have been more engaging had it made more extensive use of realistic or current business problems. This book includes no cases, which are efficient tools for connecting technical methods with real-world problems. In addition, more than 50 percent of the readings at the chapter ends about the real-world situations are dated earlier than 1983. One would expect more up-to-date information in a newly published textbook. The book is accompanied by a computer program, but the program is relatively restricted (for examples, no lot sizing policy can be specified in MRP, and the α and β values in quality control are fixed) compared to other recent software, for example, QSOM [Chang 1989].

This book is intended as an introductory text for general business students. Since most general business students do not major in operations management, the goal is to acquaint students with operations management so that they will be comfortable when they interact with people in the field of P/OM. However, the usage of the techniques presented here in business organizations and their interaction with various functional departments — like the influence of just-in-time on accounting — are not fully discussed. I think this book is more suitable for students who are interested in the mechanics of quantitative methods and who are better acquainted with mathematics than the average general business student.

Reference

Chang, Yih-Long 1989, *Quantitative Systems for Operations Management*, Prentice-Hall, Englewood Cliffs, New Jersey.

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MITTRA, SITANSU S. 1986, *Decision Support Systems: Tools and Techniques*, John Wiley and Sons, New York, 443 pp., $33.95.

A title for this book such as "Simulation Modeling and DSS" would be more appropriate. A reasonable background in mathematics, modeling, and programming is essential to understanding this book. With such a background, a student would find this an excellent textbook. According to the author, this book was the result of compiling his class notes after he discovered that few comprehensive graduate-level textbooks on the subject

of DSS were available. It is intended for computer science students who want to learn about analysis, design, and implementation of DSS and for computer systems professionals who want to build a DSS or are in the process of building one. Therefore, for the first set of users, the author has provided a set of questions after each chapter. For the second set of users, he has used a manual-like format that can also be used as a reference. Further, Mittra makes it clear that this book is hard core technical and that its readers must have a good level of mathematical maturity.

The book is well organized; it is divided into four parts, comprising 15 chapters. The first two chapters (Part I) are dedicated to introducing DSS to the reader. Chapter 1 introduces the concept of the system and goes on to explain the role of DSS in a system. The level of this chapter indicates that the reader should be fairly well acquainted with the general theory of organizations and management, as well as computer concepts. Chapter 2 then goes into the detailed step-by-step procedure of the analysis and design of a DSS. The chapter is straightforward and easy in its presentation and reading.

Part 2 consists of three chapters that deal with modeling techniques. Chapter 3 provides the foundation for model building, and Chapter 4 carries the topic further by examining optimization models. Chapter 5 caps this section by looking at other statistical models, specifically forecasting models, and their applications in business. The reader is reminded that a background in mathematics, calculus, algebra, and statistical concepts is required for a reasonable understanding of the material.

Part 3 consists of six chapters which deal primarily with simulation techniques. The general concepts of simulation are discussed, with queuing theory serving as the framework for studying and applying discrete system simulations. Continuous system simulations are presented after the reader has mastered discrete simulations. The final two chapters in this section give a detailed overview of GPSS and DYNAMO II as examples of discrete and continuous system simulation languages. Sample programs in those languages serve as a general guideline in using the languages and understanding simulations.

The reader is returned to DSS in Part 4 which consists of four chapters that include examples and contemporary issues in DSS. The author presents several practical applications of DSS, emphasizing financial planning and analysis. Two chapters focus on the first set of users, computer science students: DSS games are used as instructional tools in one, and the other covers building a DSS as a group project. The book ends by looking at the current and future trends in DSS and lists the DSS packages available today. The author describes the role of AI in DSS and lists the DSS packages that use AI.

Overall, this book is excellent for someone who is interested in modeling, decision making, and programming technology and who has a good background in the basics. Students in MBA programs would be pushed but would benefit from the scope and rigor of the

book.

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