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Book selection

Edited by JM Wilson

Discrete Stochastic Processes

RG Gallager

Kluwer Academic Publishers, London, 1996. xiii + 271 pp. £42.75. ISBN 0 7923 9583 2

The aim of this book (nominally) is to help students 'develop the understanding and intuition necessary to apply stochastic process models to problems in engineering, science and operations research.' I use the word 'nominally' because although applications are professedly the author's real concern, he avoids all reference to them and indeed takes up nearly half the preface to the book arguing—not very convincingly—why this is so.

The work focuses on stochastic processes where changes occur at discrete points in time. The motivation for separating these from non-discrete processes appears somewhat artificial (as Gallager admits) but the arrangement is apparently justified on teaching grounds. Following a brief introductory chapter on probability theory, the book provides selective material on Poisson processes; renewal processes; finite state Markov chains; Markov chains with countably infinite state spaces; Markov processes with countable state spaces and random walks and martingales. Supplementing technical examples in the text, various theoretical exercises are set at the end of each chapter.

More than half the book's bibliography, comprising twenty publications, dates back to before 1970.

Many diagrams are provided, some more effective than others, for example you need to be clairvoyant to appreciate the connection between a particular Markov transition matrix and the corresponding digraph (Figure 4.1).

The few typographical errors found did not appear to be serious. More potentially misleading was the odd notation used (for example $\bar{X}$ instead of μ for the expectation of X) and the common occurrence of formulae spilling over from one line to the next.

On page 43 I was intrigued to learn that M as in M/G/1 queues, refers to 'memoryless' rather than 'Markovian'. The distinction between codes G and GI was similarly garbled.

To sum up, *Discrete Stochastic Processes*, despite its initially impressive appearance, is not recommendable. Partial treatment of its subject area apart, the style is turgid and over-theoretical from the point of view of most would-be practitioners.

UMIST JM Freeman

Requirements of Standards: Optimization Models and Algorithms

B Goldengorin

Russian Operations Research Co., Hoogezand, The Netherlands, 1995. 219 pp. $110.00. ISBN 5 88037 008 9

The text is as announced in the title, if you understand what the title is addressing. The use of the word standards concerns how the word pertains to standard products. The rest of the title is as suggested: Optimization models and algorithms pertaining to the problems in optimizing standard products, instead of our present economic approach to nonstandardization of factory production. Standardized production has its problems in estimating the trade-offs between consumer demand, consumption, and production costs. This text provides a theoretical foundation for approaching these problems from a mathematical framework.

The models and algorithms are organized around what the author identifies as 'developing standards for object types, basic parameters and (or) size (SOTPS).' The main SOTPS design stages are divided into 2 groupings. The first grouping, in the words of the author, is

(1) Selecting a group of homogeneous products;
(2) Studies of product design, manufacturing and consumption spheres, and formulation of additional constraints;

(3) Determining basis operational (consumer) parameters;
(4) Clarifying the nature of operational replaceability (applicability) of the product;
(5) Determining the production quality factors and the way of taking them into account when a type-size sequence is constructed;
(6) Studying economic properties of the product: determining the costs as a function of product type-size, production output, demands, etc.

The book addresses these problems in Section 1.1.2 using such techniques as regression analysis.

The second grouping of SOTPs which the remainder of the book addresses is

(1) Constructing an optimization model for the requirements of standards and setting up the corresponding extremal problems;
(2) Working out a method and an algorithm for solving the extremal optimization problem for the requirements of standards;
(3) Obtaining solutions to the extremal problem and the optimization model correctness investigation;
(4) Correcting the standards requirements optimization model.

In our present bountiful economy, we are able to enjoy the luxury of nonstandardization. This may not always be the case as shortages of materials begin to occur. This may not be too far distant as the world population grows demanding an ever and ever growing diversity of products. It may come to pass within our lifetime that standard products may be a way of extending our prosperity. In that event, this book might prove very useful. The author has identified the problems and provided the necessary models and algorithms with which to address these problems. For this reason alone, I recommend this book. However, a word of caution to the reader. The translation has its rough edges and the symbols mean several things which might be confusing. For example: $\{u_1, u_2, \ldots, u_p\}$ can be a vector, a set or u might represent a vector—all in the same paragraph. However, working around these minor flaws is worth the effort. This book has potential value that might be realized sooner than one might think.

University of Maryland C Leake

Software Methods for Business Reengineering

A Bertztiss

Springer, Berlin, 1996. xiv + 275 pp. DM 78.00. ISBN 0 387 94553 9

The title of this book is somewhat misleading. What the author has done is to note the possibility of an interconnection between methods used to conduct business process reengineering and methods used to design software and to use the structure of the latter on the former. Anyone expecting, perhaps naively, a collection of programs and techniques that will instantly allow business process engineering to seek out suitable application areas and then leap into life, will be disappointed.

The author adopts the style of a guru, and whilst this makes the book easy to follow and pleasant to read, early chapters remain shallow when many sweeping statements are used. For example, the author claims that Australian pensioners liked moving to a decimal system, and this proves his point that radical change will be welcomed. I suspect that the switch to decimal currency in Britain in 1970 left pensioners perplexed. However, the author does come up with some good instant quotations, for example 'Business reengineering is reviving the spirit that operations research had in its beginning'.

The first five chapters introduce Business Reengineering and the next seven do the same for Software Engineering. The style used throughout is short snappy chapters with lots of bullet point lists of goals, approaches, or aims and explanations of what the points in the list mean. These lists have to be taken as prescriptive and there is little consideration of alternative schemata.

The next section, four chapters, concerns Business Analysis, and is a little disappointing. The emphasis is on how to conduct a questionnaire study, set of interviews or group sessions to elicit information on business processes and is perhaps better handled by reference to other authors. The fourth section, on the Reengineering Blueprint, is rather more useful. Diagrammatic approaches, including Petri Nets are discussed in the six chapters of this section.

The fifth section is one of the best. Here specification of Business Processes is considered and the author works out specifications for two cases. Later it is shown how these specifications can be reengineered in the sixth section. The emphasis is generally on taking what is going on in an organization and simplifying it, rather than taking a radical approach of moving the organization into a new dimension. Stages are eliminated, rather than the system they imply being removed.

The sixth section has six chapters discussing Implementation of Reengineering, which is important. The last chapter discusses Maintainability and Reliability and then at its end we move straight into Appendices and References. Thus the end of the book came as a shock, and I regretted the absence of a Summary and Conclusions chapter.

The book is mostly straightforward and covers some interesting ground, but is somewhat tenuous in its approach and limited in its prescriptive nature. More is required than its focussed remit. The reader may find some useful tips for conducting Business Process Reengineering, but will need to read some more texts to get a fuller picture.

Loughborough University JM Wilson

The Quality Systems Manual: The Definitive Guide to the ISO 9000 Family and TickIt

TJ Hall

John Wiley & Sons, Chichester, UK, 1995. 400 pp. £50.00. ISBN 0 471 95588 4

In a previous review[1] I pronounced a mild indictment against *total quality* as one of the latest half-baked gags (*re-engineering* being another) that aggravate the existential problem of OR by producing competing specialists of doubtful credentials. I should have liked instead OR to acquire the professional responsibility for the delivery of goods in what might be generically called applied economics consulting. This review is a due sentence for my precocity.

This book is aspiring to be the guide to the installation of the *Quality Assurance Standards* (the famous ISO 9000 Family). The ISO 9000 Family was developed in 1987, by an almost verbatim adoption—according to the author—of the British Standard BS 5750 launched in 1979. Since 1987 there has been considerable momentum in the quality assurance field and many firms from various industrial sectors have sought accreditation world-wide. The series is already working for its ISO 10000 family.

The ISO 9000 Family pre-supposes a production process (not necessarily manufacturing, but it could accommodate even the delivery of services). ISO 9001 is the more general Standard, encompassing design and production while ISO 9002 is for production proper and ISO 9003 addresses only questions of final inspection and testing. Hence the book rightly is modelled to conform with ISO 9001.

The book is structured as a model for the quality assurance effort that a company should initiate prior to assessment and accreditation. If offers a more analytical and frequently pictorial re-reading of the clauses of ISO 9001 and essentially delivers to the interested company one feasible solution for their quality assurance process installation. To this effect the author assumes a company (aptly baptised New Era plc.) and goes through the ISO 9001 clauses locating problems, establishing procedures and developing forms.

Hall's reading of the ISO 9001 clauses is very detailed. At times the book is reminiscent of other more straightforward and vulgar 'how-to' manuals, for example on correspondence, personal profiles or report writing. He leaves nothing to chance in his effort to maximize the company's potential for a positive assessment. Through his writing he seems a very congenial person and he shows his strife for a user friendly interpretation of the Standard's clauses, a manual-within-a-manual. To this effect he even produces a model quality manual, letters by the management to staff, model forms of all kinds and advice both on nitty-gritty and minutia. The advice on how to prepare for the 'big day' is delightful: 'Arrange for your most senior manager to be around . . . book car parking space . . .', 'It is a polite gesture to provide with coffee . . .' etc., etc.

The final chapter of the book is devoted to TickIT (ISO 9000-3), the equivalent standard for software production, giving a concise review unlike the previous handling. Last, a useful reference section with a glossary of terms, summary of ISO 9001 clauses, related standard and even accredited third party certification bodies is appended. The analogy is that of a travel book as opposed to a book of geography. The attributes shown are not so much erudition and analysis as accuracy of information and effectiveness in guidance.

The book is very discursive, goes into tremendous depths on procedures but does not offer any criticism on the general idea of quality assurancee. It does not even question the procedures established. The author has undoubtedly the highest regard for the capacities of the quality assurance processes once established within a company. He maintains an almost metaphysical belief that quality assurance will alleviate the company from all organizational evil.

A review of organizational procedures is without doubt an efficient way for some introspection about company affairs but one should not lose sight of the ultimate goal of the organizations which is the provision of a product or service with a high social value. Yet very indirectly and unwittingly Hall offers some critique for the established standards on quality assurance as he demonstrates in many instances the increased bureaucratization and respect for form rather than substance that quality assurance, as prescribed by the Standard, entails.

In addition to the institutionalization of the ways quality is assured by the Standard (even if highest), the manual shows that if the management of a company is sufficiently diligent and is willing to work by the book for the assessment it will provide the assurance necessary for the accreditation but it could have no bearing on the final outcome whatsoever. It should be acknowledged that Hall touches this point, even if lightly, by saying that the Standard cares for standard quality irrespectively if the product is of consistently high or of consistently low quality. It will be interesting to find out eventually the influence of the application of the Standard to the companies and their products and services.

On the practical side, my worst fears about the OR profession have materialized. Clearly there is now a further discipline that we have to compete with, that of the Quality Assurance Consultant. The preparation of the company for an ISO 9001 accreditation does not involve high OR theory but can fit very well the job description of an OR practitioner whether in-house or external consultant. I should have expected Hall, who is among the pre-eminent experts in the field, to be able to propound this view, but he has left the territory open to anyone without accreditation other than a declaration of interest.

The above reservations should not deter OR practitioners from getting hold of a copy of the book. Any colleague that has struggled single-handed to seek ISO 9001 registration on behalf of a client will find the cover price a worthwhile investment. Last, it should be noted that it is a pity that the book is not offered also in electronic form. I am sure that this alternative would warrant double the price just for the possibility to use the forms.

Kifissia, Greece S Kafandaris

Reference

1 Kafandaris S. (1996). Review of 'Problem solving: A statistician's guide' *J Opl Res Soc* **47**: 835–836