continually improve performance, and the purchasing area is no exception.

MRP II and JIT/TQC in purchasing and supplier education are covered in Chapter 15. Without proper education MRP II and JIT/TQC will not be successful and will not generate their true benefits. Suppliers are key to the success of MRP II and JIT/TQC. They therefore need to understand these disciplines.

Purchasing in the 21st century is going to be marked by continuous changes, by who can gain the competitive edge first, who will be the most flexible and who will build the best supplier relationships. This will only be achieved by following the process as described in Schorr in a step by step fashion. An organization must however be willing to, as Schorr states in Chapter 16, 'create the spark, ignite change'! Only then can it happen!

If you really want to know something about purchasing then this is the book to read. It is most definitely relevant and more importantly up to date. It will certainly be a handy reference book for a course on purchasing.

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Numerical Optimization

J Nocedal and SJ Wright

Springer, 1999. xx + 636 pp. £49.50.
ISBN 0-387-98793-2

In the Preface, the authors declare the aims of this textbook: 'This is for people interested in solving optimisation problems'. Later, they add to this, explaining that the people in mind ('The Audience', not 'The Readership'!) are students on graduate courses, and practitioners. So, will such a readership gain from reading this book?

Inevitably, the answer is both yes and no. Yes, because this book covers the state of the art in optimisation of functions of continuous variables, and does so in a way which is approachable. No, because there are places where the reader is assumed to have a more extensive mathematical knowledge than the statements in the Preface would imply.

On the positive side, the book is well written, and has a clear, expository style to the text. The authors deliberately start with unconstrained problems, whilst constrained problems occupy a little less than half the book. This means that non-linear problems appear first, with linear and quadratic programming following on. This is a change from the usual order of presentation of material in OR education, although it is one which is found in mathematics programmes. Throughout the text, the authors bend over backwards to help the reader to see the mathematical context of each development. They hold the reader's hand as the text takes a careful line through the mixture of exactness and heuristics which is characteristic of numerical optimisation. The development of ideas of non-linear unconstrained optimisation follows a logical pattern, with one-dimensional methods leading to multi-dimensional problems and least squares, with asides on methods of calculating derivatives. Linear programming is dealt with in two chapters, one on the simplex algorithm and the other on interior-point methods. Then comes quadratic programming, an overview of methods for handling constraints, and a comprehensive guide to sequential quadratic programming.

I felt that this book fell down on the lack of practical examples. Numerical optimisation, whether the problems are linear or not, is important in industry and business. One could come away from this book without having seen the practical uses of the material. The exercises in each chapter give the impression that theoretical results are the important ingredients of optimisation. Solving these exercises requires an advanced level of mathematical rigour and sophistication beyond that which the preface suggests.

In summary, this is a very good book to use to gain an up-to-date view of the theory of optimisation, and so will find a place in many mathematical libraries. Its value to those constructing and solving models in OR is not so high.

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Measurement Made Accessible: A Research Approach Using Qualitative, Quantitative and Quality Improvement Methods

DL Kelley

Sage Publishers, 1999. xii + 211 pp. £39 Cloth, £17.99 Paper.
ISBN 0-7619-1023-9 (Cloth), 0-7619-1024-7 (Paper).

Initially I was very excited about reviewing this book because my own research area is in performance measurement and organisational improvement. A respected publisher produces the book and so I was expecting something substantial to read. Actually, I was hoping to learn something new. Unfortunately, I was a little disappointed to find the text to be an introductory one dealing with the practical aspects of measurement. The text covers areas traditionally seen in research methods, statistics, quality problem analysis and improvement and qualitative research texts. However, the book is well written and each chapter is short and to the point.

Chapter 1 deals with an introduction to measurement and clearly states that the reader will not become an expert in the areas of statistical research and measurement procedures but will obtain an overview of the subject and learn how to approach practical measurement situations. For those intending further study of the subjects covered there is a reasonable list of references although many more up-to-date texts could easily have been added. The work refers to these