Book Selection

Edited by U Aickelin

M Lytras and A Naeve (Editors): Ubiquitous and Pervasive Knowledge and Learning Management: Semantics, Social Networking and New Media to Their Full Potential (Hardcover)

K O'Sullivan (Editor): Strategic Knowledge Management in Multinational Organizations (Hardcover)

H A Eiselt and C L Sandblom: Linear Programming and Its Applications (Hardcover)

M Gondran and M Minoux: Graphs, Dioids and Semirings: New Models and Algorithms (Operations Research/Computer Science Interfaces Series)

Ubiquitous and Pervasive Knowledge and Learning Management: Semantics, Social Networking and New Media to Their Full Potential

M Lytras and A Naeve (Editors)

IGI Publishing, 2006. 324pp. £54.62
ISBN: 1599044835

This book carries a very distinctive title, reinforced by an equally substantial (if not entirely grammatically correct) subtitle—'Semantics, Social Networking and New Media to their Full Potential'. It claims to present an alternative view to ubiquitous and pervasive knowledge, architectural frameworks and methodology issues, including techniques and tools developed in the domain of ontology building, analysis and the Semantic Web. One could not accuse the editors of lacking ambition in their scope, but the result is a decidedly mixed bag of offerings from a collection of 20-odd contributors.

Ubiquitous (or 'pervasive') computing in this context refers to the ways in which humans and computing devices will interact when the acts of information processing and display have been so thoroughly integrated into everyday objects and activities that they become part of the normal fabric of going about one's business. Eleven chapters address a range of issues, each starting with a brief introductory abstract and closing with case studies, suggestions for essays to prompt the reader into active consideration of the issues raised, and links to appropriate websites. In such a substantial tome chasing down the 'state of the art' in knowledge and learning management and the associated enabling technologies is rather an uphill struggle, and perhaps one doomed to failure. The editors themselves acknowledge this, and attempt wisely to offer a flavour of different aspects of ubiquitous computing rather than aim for absolute completeness. As a result, some sections already seem rather dated, with descriptions of technologies reading as almost quaintly as projections of life in the 21st century made by science fiction magazines in the 1950s. I was reminded by the words attributed to Niels Bohr (among others)—'Making predictions is very difficult, especially about the future'.

Topics covered illustrate just how pervasive 'pervasive computing' could become—case studies are proposed of how small hand-held devices can support everyday living, and e-commerce as well as leisure and cultural activities. Their use in education—both as an adjunct to traditional classroom-based learning and in distance learning environments—is addressed in considerable detail. As a result, the ways in which humans operate (and thus interact with) the computing power that literally envelops them are addressed in several chapters, covering examples such as in support of helpdesk operators and in more general issues such as knowledge and information management. Relatively little attention seems to have been paid to areas such as games technology (in which increasingly complex environments can be used—in 'serious gaming'—to support training and professional development through high-quality exposure to simulated situations), or to the apparent ubiquity of social networking websites (such as Facebook), or to the knowledge management aspects of applications such as YouTube (such as companies placing instructional videos for their products on the web, and universities allowing students to watch their lectures a second time).

I found it hard to determine whom the editors consider to be the audience for this book. It is not a volume to read from cover to cover, as the varying styles of the many different contributors make for a somewhat uneven ride. This would probably be of most use as a library resource to dip into for a series of very personal perspectives on what is undoubtedly a significant part of today's world, where technologies such as Wi-Fi and Bluetooth make us all increasingly interconnected and the presence of substantial computing power indeed ubiquitous and pervasive.

QinetiQ Ltd   B Spedding

Strategic Knowledge Management in Multinational Organizations

K O'Sullivan (Editor)

Information Science, 2007. 405pp. £94.05
ISBN: 159904630X

This edited book is divided into four sections: organizations, technology, learning and leadership as according to the editor Kevin O'Sullivan, the four sections are the four pillars of knowledge management as postulated by authors Baldanzer and Stankosky (1999).

The authors are truly international coming from such countries as Australia, Canada, Denmark, France, India, New Zealand, Scotland, Spain, Hong Kong, The Netherlands and the United States. According to the editor the target audiences are practitioners, researchers and students, claiming that multinational organizations are multi-market and thus applicable to many readers. This is I think, a very simplistic definition of what it means for an organization to be multinational.

This book has a preface but fails to make a link between sections within the actual text. Reading through this preface we fail to find a definition of any sort to cover what knowledge management is meant by in this book—however, some linkages are made between the chapters. The initial impression we get is that the contents are 'bitty' and that the content was determined by who submitted rather than by an editorial judgement that actively sought chapters to fit their concept. This impression is later confirmed by the chapters, for instance, on customer relationship management and which have little, if any, relationship to knowledge management as they discuss it.

The result of this rather lightweight preface for instance, is that Chapter 1 dives into the issue of knowledge transfer without either a preamble or explanation of the terms to be used. Considering the audience that this book is aimed at, it falls between being useful for all three. Some chapters are suitable for postgraduate students. However many practitioners would be turned off by the writing style. In many chapters the international author list brings with it a wide interpretation and understanding of knowledge management, with frequently convoluted sentence construction that appears to come from authors translating in their own minds from their natural language into English.

The international set of authors and academic backgrounds also means that they reference texts and theory that are not necessarily well known. For instance in Chapter 2 the discussion revolves around James Maxmin, Zero Attribution and Apache software. If you do not already understand all this you will not be able to follow the discussion. My message to these authors is not to presume pre-knowledge by any readers. In some chapters however, so little pre-knowledge is attributed to the readers that they are basic primary texts—no reasonable balance is made between these levels—it would have

been easier for the intended reader if, rather than using the four 'pillars', the content were divided by level or by intended audience. This way we could have the chapters that recount well known, and frequently written about, intellectual capital measurement or knowledge management frameworks, in a section giving pre-reading for those new to the topic. This would help divide the book up more usefully and thus we would not expect the section headed Leadership, to actually be about leadership in the knowledge management field.

My overall conclusion, sadly, is that this is a book that adds little to our understanding of knowledge management unless we are a complete beginner and even then we would need a guide to inform us which chapters (not many unfortunately) might help us prepare ourselves for study. I would not recommend readers to purchase this book, but a single library copy might have some value for students.

University of Westminster   E Coakes

Linear Programming and Its Applications

HA Eiselt and CL Sandblom

Springer-Verlag, Berlin, 2007. 380pp. £78.99
ISBN: 3540736700

According to its authors, the aim of this book is to focus on the modelling aspects of Linear Programming (LP) and to illustrate the process from problem modelling to analysis of optimization results. Reformulation is another aspect that the authors seek to emphasize together with a good collection of illustrative applications of LP. In my opinion, this book clearly achieves its purpose by making a concise and rigorous presentation of how to develop LP formulations for a range of decision and optimization problems. The book also makes a very illustrative presentation of how to interpret the results from the optimization process in order to support the decision-maker.

Eiselt and Sandblom tell us that this book is the last of a trilogy with previous books being 'Integer Programming and Network Models' and 'Decision Analysis, Location Models, and Scheduling Problems' (although in my opinion, the continuity between the three books is not entirely apparent). Nevertheless, the book is a good self-contained resource that introduces readers to the vast area of LP and its applications. This book is suitable for a variety of audiences including undergraduate and postgraduate students, practitioners and scientists who are new or relatively new to LP. The reader who is more experienced in this area might still find the book an enjoyable read. Unlike many other books on the subject that attempt to cover many topics within LP, the scope of this book is limited to fewer topics and this is precisely one of its strengths. The reader can expect a presentation of LP formulations, the simplex method and some of its variants, selected alternatives to the simplex method, post-optimality analysis, reformulation techniques and multi-objective programming.

The book does not give a thorough presentation for all these topics but it definitely helps the reader to grasp the main concepts and principles with a good combination of mathematical exhibits and illustrative practical examples.

The book starts with two chapters dedicated to Linear Algebra and Computational Complexity. These topics would normally appear as appendices in other books but it is certainly a merit to have these two important topics at the beginning. Chapter A gives a concise introduction to linear algebra concepts relevant to LP and illustrates further a selection of them (it would help if a brief justification is given to why certain concepts are illustrated further). The chapter rightly avoids giving lengthy mathematical proofs but refers readers to relevant sources. Chapter B gives a brief account of computational complexity, perhaps not thorough enough to fully grasp the topic but certainly the minimum an optimization book should offer.

Chapter 1 is a gentle introduction to LP concepts and specifically the process from problem modelling to optimization. Section 1.5 'Solving the Model and Interpreting the Product' gives a very useful illustrative example of slack and surplus variables helping readers to understand the information usually displayed in some optimization packages. Chapter 2 clearly describes modelling, realization of objectives, constraints and difference between theoretically optimal and practical solutions in optimization. The chapter covers a good sample of optimization problems and uses them to teach important skills and tricks in problem modelling. Chapter 4 is a formal representation of duality with detailed description of theory and also illustrative examples to facilitate the interpretation of dual and primal problems and their relation. The reader with lesser mathematical background will find this chapter more difficult to digest and less illustrative in comparison with the previous chapters, particularly because the theoretical presentation in prose format is not the most amenable and easy to follow.

Chapter 5 is about the dual simplex method and gives several illustrative examples. The explanation is brief but concise. Also, upper bounding and column generation techniques are briefly but formally explained with one or two examples. In general, the chapter gives readers a basic idea of the logic behind some variations of the simplex method, but readers will perhaps need to consult other sources for a thorough presentation of these methods. Chapter 6 focuses on post-optimality analysis as a formal exposition of sensitivity analysis. The effects of adding/deleting variables, constraints and the effect of changing values are illustrated effectively using the graphical method. A nice feature of this chapter is an example of a product mix problem used to explain, from the analysis and the management perspectives, how to interpret post-optimality analysis and interpret the tableau resulting from the simplex method. Chapter 7 describes and illustrates with detailed examples some alternative methods like traversal, external pivoting, gravitational, ellipsoid, bounce and interior-point methods. The chapter is very brief and

focuses on the interior-point method mainly but the overview of the other methods is a good addition. The chapter could be improved by adding references to successful implementations of these alternative methods to real-world problems. Also a critical analysis of simplex *versus* interior-point methods would enhance the chapter.

Chapter 8 explains very well important techniques to reformulate problems that do not fit into the 'standard' LP model. Although not an in-depth presentation, this is a very useful chapter because it gives readers a good idea of available techniques when facing optimization problems that present some modelling difficulties. The chapter covers the effects of reformulating variables, constraints, objective functions and also gives overviews of minimax, maximin, bottleneck and fractional problems. Any reader would greatly benefit from this chapter although certainly looking for more in-depth material would be necessary. Finally, chapter 9 gives an introduction to multi-objective programming that serves as a good complement to the rest of the book. Concepts on vector *versus* scalar optimization are reasonably well explained and the chapter also introduces some of the established techniques for multi-objective optimization such as weighting, constraint, goal programming, fuzzy programming and bi-level programming.

Overall, 'Linear Programming and its Applications' by Eiselt and Sandblom is a good introductory book to Linear Programming that combines formal presentations of concepts and techniques with illustrative examples. The book covers a good sample of real-world problems in operations research and illustrates their LP formulation. The book gives in-depth presentations of central topics in LP while the thoroughness on other topics is lesser. Something the book misses is the introduction to some optimization software tool that would enormously help readers less familiar with optimization in general and LP in particular.

University of Nottingham   D Silva

Graphs, Dioids and Semirings: New Models and Algorithms

Michel Gondran and Michel Minoux

Springer-Verlag, 2008. 388pp. £77.00
ISBN: 0387754490

The scope and aim of the book are succinctly explained in the preface as follows by the authors:

'During the last two or three centuries, most of the developments in science (in particular in Physics and Applied Mathematics) have been founded on the use of classical algebraic structures, namely groups, rings and fields. However, many situations can be found in which those algebraic structures do not necessarily provide the most appropriate tools for modeling and problem solving ... a more primitive algebraic structure as compared with fields, or even rings, ... will be referred to as a semiring ... the structure of a canonically

ordered semiring ... will be called throughout this book, a dioid ... it is to be observed here that the operations Max and Min, which give the reals a structure of a canonically ordered monoid, come naturally into play in connection with algebraic models for many problems thus leading to many applications for dioid structures'.

The authors carefully explain with examples what is meant by a canonically ordered monoid, semiring and dioid, and go on to show in the book the relevance of these algebraic structures to such classic operations research problems related to graphs and networks, such as the shortest path problem and maximum weight spanning tree problem and so on.

It will be clear from the above that this is a book for specialists in the algebraic aspects of OR rather than for the ordinary practitioner, or student of OR. If one looks at the list of chapter headings: Pre-Semirings, Semirings and Dioids, Combinatorial Properties of Semirings, Topology and Ordered Sets: Topological Dioids, Solving Linear Systems in Dioids, Linear Dependence and Independence in Semi-Modules and Moduloids, Eigenvalues and Eigenvectors in Endomorphisms, Dioids and Nonlinear Analysis, and Collected Examples of Monoids, (Pre-) Semirings and Dioids, it is evident that it is more an abstract algebra book rather than an OR book.

The progress of OR would, to a considerable extent, depend on researchers advancing beyond the current frontiers in regard to the mathematics used. Although this book may not be relevant for OR undergraduates or practitioners, I would recommend this as a book to be added in the libraries of institutions where graduate courses in OR are taught, because it may provide ideas for PhD students and others to explore further the concepts developed in this book, and maybe make some breakthroughs in applications of graph theory in OR.

Northern Michigan University   R Bharath