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tive dissemination of information (SDI) than of a postmodern age.

A problem with Miksa's focus on individualism is its tendency towards elitism. This tendency is not new in the context of library classification, as is evident from Miksa's discussion. The shift from a concern with the best books for the public to a concern with precise scientific information is also a social (and political economic) shift from serving the general population to catering to an elite of researchers and policy makers. It is a shift away from the practical application for people's ultimate betterment that Dewey the reformer initiated. Making "one's own computer" the prerequisite to an allegedly postmodern version of individualism and privileging electronic information for "one's own library" is a major service to a powerful elite. This elite is characterized by combinations of economic and educational resources concentrated in predictable countries and populations. Since the *DDC* is the most widely used classification in the world and commonly used in school and public libraries and in national bibliographies it is a potential vehicle for inclusion. In this role, the *DDC* can open up social discourses and their construction of realities. A consciousness of this potential will assist the *DDC* editors in using techniques such as Miksa suggests to avert the hegemony of either a "universal" scheme or a scheme that caters only to elites.

A more helpful interpretation of postmodernism might come from postmodern architecture. Its eclecticism crossing (or transgressing) styles and periods illustrates that structures need not be built on only one theme to be able to stand up. Miksa suggests various strategies for change that might foster such an eclectic structure. Such mechanisms are already under development in the *DDC*. For example, Miksa's suggestion that various specification levels be available in the *DDC* is well-established in the long-standing principle of broad and close classification. His idea that a highly specific standard edition be the basis for this flexibility sees the *DDC* as a potential tool for large general collections and focussed in-depth collections in addition to its current uses. To offer an electronic means of determining appropriate segmentation as Miksa proposes would certainly expedite the process.

Miksa's second suggestion of alternative arrangements is another way in which individuals and libraries serving diverse populations can be addressed by the *DDC*. Part of the research agenda Forest Press has defined for the *DDC* is decomposing *DDC* numbers into their facets. This innovation offers a flexibility for classification as seen in classified catalogues (rejected in North America since Cutter converted us to the dictionary model). Even within one library or virtual collection there can be a diversity of results. Of course, this flexibility will rely on electronic capabili-

ties that, again, suggest an elite, but one dependent on institutional rather than individual resources – libraries rather than "one's own computer."

The most intriguing, valuable and difficult suggestion Miksa makes is to develop the capacity in the *DDC* to discover hidden patterns amongst facets of knowledge. The decomposition of *DDC* facets will be a step in enabling this task. However, the current structures by definition inhibit finding new patterns. The choice of what facets are included (as Ranganathan pointed out, there are infinite facets and not all can be included) and the elements in their arrays limit a system's parameters. The very idea of a facet implies at least two levels of hierarchy – the overarching concept defining the facet and the elements in the array that are included under that concept. However, these obstacles should not deter our search for different patterns. As Miksa notes throughout, hierarchy is only one way of organizing knowledge and can profitably be questioned. Breaking free of hierarchical thinking – the mode of thought in which we have been nurtured and trained – is extremely difficult. Searching for different patterns has great potential for opening our minds to different modes of thought. Joan Mitchell, the current editor, encourages facilitating access to the *DDC*'s universe of knowledge from different points-of-view. My own current project to make the *DDC* accessible through a feminist lens is part of this effort. Such projects offer the opportunity to find new patterns as Miksa suggests.

Miksa obviously believes that the *DDC* offers the flexibility to continue to be meaningful in a postmodern age. Miksa's *The DDC, the Universe of Knowledge, and the Post-Modern Library* offers provocative insights from the past to point the way toward a productive future for classification and the *DDC* in particular.

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"Knowledge Management" is becoming very much a watchword in business and management circles these days. Knowledge is now said to be a crucial factor of production as well as a product in an increasingly knowledge-based economy. Like it or not, we have been thrust into the age of the knowledge society. In-

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formation technology has certainly played a big part in bringing this about. Computer-based technology made possible the efficient and reliable transmission, storage, and manipulation of vast amounts of information. IT has reshaped practically all business and industry sectors. More recently, with the advent of the Internet and intranets, IT is again changing the lives of millions of people worldwide. We experience the exhilaration and wonder of having vast amounts of information at our fingertips -- navigating, browsing, and discovering potentially valuable resources. Unfortunately, we also experience frustration and sometimes even despair as we confront the tasks of filtering, selecting, organizing, and interpreting the torrents of information in search for the relevant and the useful.

This is mostly good news for librarians and information specialists. People naturally look to the expertise of professionals who have been dealing with information and knowledge on a large scale for a long time. Faced with this embarrassment of riches in information, people need help to make sense of it all, to turn information into organized knowledge. With this honour comes the burden of high expectations. The information environments that people face today are often orders of magnitude beyond what they have been accustomed to in the past, at least in volume, but also in complexity and dynamism. Information items today are much more finely divided, more densely connected, and more rapidly changing and moving. The challenges for managing knowledge effectively, whether for individuals, for workgroups, for organizations, or for communities, are daunting.

IT can help. For example, we cannot imagine today's information systems infrastructure without the enormous computational powers of database technologies. However, much of the power of IT has been limited to dealing with highly structured data, as in the processing of business transactions. Can IT provide comparable leverage for dealing with knowledge as it gives us for dealing with data?

Indeed, IT researchers have been developing computational concepts and techniques that capture more of the meaning of information than in traditional data management, thereby attaining sophisticated processing capabilities. While some of the technologies may have the label "knowledge" attached to them, the extent to which they deal with knowledge is understandably only a tiny fraction of what one might consider to be knowledge more generally. Nevertheless, some of these techniques can potentially increase significantly the leverage that information professionals can have in dealing with today's "knowledge management" demands.

Alas, using IT to deal with knowledge is much more fraught with difficulties and danger than in dealing with plain old data. Social and human issues have always been important factors in the effective use of computer technology (Kling, 1996). Now, even more than with conventional IT, one cannot hope to exploit the potential benefits of the new knowledge-oriented technologies without deep understanding of the work context, at the levels of individuals, communities, and organizations, and taking fully into account cognitive, emotive, social, political, economic, legal, and cultural dimensions.

Fortunately, as the concept of knowledge management gains ground, many organizations are reorienting themselves to take better care and make better use of the knowledge within their purview. Leading edge organizations are trying out new technologies to better understand their capabilities and limitations, and to learn how to refine and adapt the technologies to fit their context of use.

This edited volume fills an important gap in the literature by helping readers appreciate the relationship between the visions expounded by many popular books on knowledge management (e.g., Stewart, 1997; Davenport, 1998; Sveiby, 1998) and the technological advances that may be needed to realize those visions. Simple hypertext technology and text-based search engines can only take us so far. We need much more experimentation with new technologies to attune them to the needs of real organizations.

The book covers a wide range of technologies used in various knowledge management applications. These are well illustrated with examples and realistic application settings. The technologies are presented from a user's point of view. The occasional technical passages provide a glimpse of the computational underpinnings in some of the technologies.

The book begins with an introductory chapter by the editors that outlines the integrating framework that is used to give coherence to the document. The framework consists of four components, each covered by one part of the book: the flow of knowledge, knowledge cartography, communities of knowledge workers, and knowledge repositories and libraries. The editors refer to this as the knowledge management architecture. Two chapters are devoted to each component of the architecture.

Chapter 2, "The Lessons Learned Cycle", by Gert-jan van Heijst, Rob van der Spek, and Eelco Kruizinga outlines different ways in which knowledge flows within an organization, and the role that organizational memory plays. Different styles of IT support are discussed. They can differ in the modes of collection and distribution – each can be passive or active, in indexing schemes for search and retrieval, and can be narrowly or broadly directed. Different kinds of organizational memory are dubbed the knowledge at-

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tic, the knowledge sponge, the knowledge publisher, and the knowledge pump.

In Chapter 3, "Knowledge Pump: Supporting the Flow and Use of Knowledge," Natalie Glance, Damian Arregui, and Manfred Dardenne elaborate on the concept of the Knowledge Pump. The central idea is that there can be an engine that actively facilitates the collection, publication, and distribution and retrieval of information. The concept builds on work in collaborative information filtering. Communities of interest are built up around repositories of documents through the use of ratings and commentaries. Social mechanisms are supplemented by automated statistical analysis.

Part 2 of the book is entitled "Knowledge Cartography." This is a nice evocative term that refers to making the structure and terrain of distributed knowledge explicit – for example, by using graphical representations that can be visualized. Hierarchical structures are used extensively in knowledge organization. For organizing and managing large bodies of knowledge with complex relationships, more elaborate and specialized structures are usually needed. These are hard to construct and manipulate without the assistance of computer-based tools. For effective support, the meanings ("semantics") of the types of relationships represented by the graphical links need to be precisely defined.

In Chapter 4, "Negotiating the Construction of Organisational Memories," Simon Buckingham Shum reviews the role of negotiation and argumentation in knowledge work. Graphical representations of knowledge structures are used to support collaborative work, and also serve as group memory. Shum discusses gIBIS, QOC, DRL and collaborative hypermedia. The types of linkages between knowledge elements include "is-a-subgoal-of," "is-an-alternative-for," "supports," "objects-to," "generalises," "specialises," "is-suggested-by," "responds-to," among others. Hands-on practicalities for using these tools are discussed. These include cognitive costs and benefits, differences in modes of group work, organizational culture, and the problem of context. There are also issues in formalizing knowledge, with political and power implications.

Chapter 5, "A Technology for Supporting Knowledge Work: The RepTool," by Brigitte Jordan, Ron Goldman, and Anja Eichler describes a software tool which is essentially an object-oriented database augmented with drawing tool capabilities. The tool allows users to represent various aspects of their "workscapes", such as physical office plans, social relationships and networks, and ideas and project responsibilities. Because the objects are given graphical representations (as icons) which are freely manipulable by the user, they can be laid out and presented as maps. Rela-

tionships can be shown via various types of links, arrows and lines defined by the user. Results of queries can be shown as highlighted objects or links. The usage scenarios of the tool are well illustrated using an advertising agency setting.

It is interesting to note that, while the software tools enable the construction, manipulation, and display of these "knowledge maps" in various forms, it is the interaction between these encodings of knowledge and the human users in social and collaborative contexts that make them meaningful and useful.

Part 3 examines how two different kinds of information systems assist knowledge workers in working together as communities. Chapter 6, "An Environment for Cooperative Knowledge Processing," by Wolfgang Prinz and Anja Syri, outlines how an administration process in a government ministry can be supported by the POLITeam system. An officer may receive 100 to 200 folders a day. Folders contain documents that may need to be annotated, approved, or sent back for rework. Documents can range from paper documents to video clips. The variability in the work process means that this kind of work cannot be handled adequately by existing commercial workflow systems. The solution combines the concepts of electronic circulation folders and shared work spaces. It provides a workflow coordination medium for transporting electronic documents such as spreadsheets, presentations, audio, and video. It supports electronic signatures, a tracking mechanism that preserves worker privacy, fast browsing and annotation, and integration of paper documents and video conferencing. The shared workspace component provides support for less structured collaborative work processes.

Chapter 7, "Ariadne: Supporting Coordination Through a Flexible Use of Knowledge Processes," by Carla Simone and Monica Divitini, describes a framework for supporting coordination in knowledge work. It begins with a good discussion of the struggle between the rigidity found in first generation commercial workflow systems and the trend to achieve flexibility, often at the expense of process definition. The Ariadne framework aims to achieve flexibility while providing a high level of process specification, and therefore stronger computer support. This is done by defining appropriate communication primitives and associated protocols with explicit semantics based on categories of articulation work. The behaviour of computational coordination mechanisms are formalized mathematically. An agent-based implementation of the Ariadne framework is outlined.

The final two chapters, on repositories and libraries of knowledge, should be of special interest to the knowledge organization community. They address IT support for the final component of the four-part knowledge management framework. Here, the main

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challenge is considered to be knowledge representation and processing techniques that can leverage computational power.

Much of the richer kinds of recorded knowledge are manifested as natural language documents, possibly supplemented with diagrams and charts and formulas, especially in technical domains. While access to a source document can be facilitated by classification, indexing and information retrieval techniques, the knowledge embedded in the source document still needs to be interpreted and manipulated manually. For example, to maintain the array of technical documentation in an engineering project, the tasks of keeping them consistent, looking for similarities and discrepancies and reconciling them, drawing new conclusions, and updating them – remain painstakingly difficult and slow, and are therefore often neglected or poorly performed. The solution is to seek deeper knowledge representation mechanisms that convey the underlying semantics of the subject matter – i.e., to identify appropriate ontologies and associated reasoning mechanisms. Both of these chapters draw on experiences in managing complex knowledge environments in engineering projects.

Chapter 8, "From Natural Language Documents to Sharable Product Knowledge: A Knowledge Engineering Approach," by Dietmar Rösner, Brigitte Grote, Knut Hartman, and Björn Höfling, takes the interesting position that a natural language document should only be viewed as a surface-level (and partial) presentation of a deeper non-linguistic level of knowledge. Knowledge management therefore should deal with the deeper level of representation. The chapter describes how technical manuals (e.g., for automotive repair) are codified through a semi-automated knowledge acquisition process into machine-processable knowledge structures. The implementation uses the LOOM language, which combines capabilities of description logics, forward and backward chaining, and object-orientation. From this underlying representation, surface-level documents can be generated in multiple languages (English, German, and French), and to meet different levels of reader expertise. The generated document provides hypertext links to the underlying representation, and can also serve as a query interface to that underlying body of knowledge.

Chapter 9, by Otto Kühn and Andreas Abecker, titled "Corporate Memories for Knowledge Management in Industrial Practice: Prospects and Challenges", also serves as the concluding chapter to the book. It takes a broad view of the kinds of knowledge management support that can be useful during a product development cycle. The issues are illustrated with three case studies – crankshaft design, quality assurance for vehicle components, and bid preparation for oil production systems. Noting the relative lack of receptiveness by industry to earlier expert systems technology, the corporate memory approach aims at a more moderate set of goals which complements and integrates existing systems such as product-data management systems, workflow, and hypertext systems. The chapter's authors envision a corporate memory architecture that enhances data management and document management with knowledge processing capabilities – i.e., complex inference including deductive rule execution, constraints processing, case retrieval, rule induction, integrity checking and abduction. There would be data, documents and deep structure knowledge at the case-specific level, generic information level, and ontological (meta information) level. Knowledge utilization support services include explanation, and decision suggestion and critiquing. Knowledge evolution support includes redundancy detection, contradiction detection, and rule insertion.

All in all, the book is a welcome addition to the growing literature on knowledge management. There is a paucity of books that cover the technology aspects in depth for the non-technical reader, while giving substantive attention to organizational and social processes and issues. This book fills that gap nicely. It is not a comprehensive text on knowledge management technologies. What it does is to present a sufficiently wide range of technologies in detailed, concrete usage settings to allow the reader to appreciate their significance, and their potential benefits and limitations. Some of the technologies are more experimental than others. The reader is therefore given a chance to look ahead into future generations of knowledge management technologies. The chapters are consistently well-written and readable. The interested reader will find excellent pointers to further reading in the more than two hundred references. The book includes a subject index, lists of figures and tables, and the addresses and e-mail of contributors. This book should be illuminating and thought-provoking for all those interested in knowledge management.

<div style="text-align: right">Eric Yu</div>

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Sveiby, K. E. (1997). *The New Organizational Wealth:*
Managing and Measuring Knowledge-Based Assets.
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DAVIS, Sydney, and NEW, Gregory R. **Abridged 13**
Workbook for Small Libraries Using Dewey Deci-
mal Classification Abridged Edition 13. Albany,
NY: Forest Press/OCLC, 1997. ix, 71 p.
ISBN 0-910608-61-X.

Abridged 13 (1997) is a true abridgment of the
DDC 21 (1996) printed from a database prepared at
the Library of Congress by a computer assisted edito-
rial support system. Accordingly, it has all the new
features of the unabridged DDC 21: revised schedules
for 350-354 Public administration, 370 Education, 570-
590 Life sciences, and new numbers for countries of
the erstwhile Soviet Union among the major revi-
sions. Terminology has been updated to reflect inter-
national usage; number building instructions have
been made more explicit; the structure of notes ap-
pended to various entries has been simplified; captions
have been improved; the use of standard subdivisions
has been a bit regularized. In Public administration
and Life sciences, the citation order of facets has been
reversed to reflect the shift in the current literature of
these disciplines. The manual has been expanded and
indexed, and there are more references to the manual
in the schedules. The relative index has been expanded
by forty pages to guide users to the correct numbers.
The new abridged edition in a single volume provides
small libraries with the updated features of the un-
abridged DDC 21 at a much lower price.

Sydney Davis was the first to write a full length
book in 1993 on any abridged DDC, namely on
Abridged DDC 12 (1990). The workbook under re-
view is a revised and updated edition of that pioneer-
ing work. Mr. Davis, senior lecturer at Charles Sturt
University, Australia, is an experienced teacher and
writer who has taught classification in Europe, Africa,
and Australia. His workbooks (published in 1990 and
1997) on the full DDC 20 and DDC 21 have already
been acclaimed by students and reviewers. The asso-
ciation to this workbook of Gregory New, Assistant
editor of the DDC, and its publication by Forest Press
makes it de facto an official guide to the theory and
practice of the abridged DDC 13.

The workbook is simple, readable, and practical,
and it constitutes a clear and valuable introduction to
the Abridged 13; it assumes no previous knowledge of
its potential users. All illustrations used as examples,
though imaginary, are well chosen to highlight the in-

tricacies and finer points of classification and number
building.

The workbook is divided into 14 small chapters.
The first six chapters provide a brief introduction to
library classification, to the Dewey Decimal classifica-
tion, to the history and management of the abridged
edition, to the organization of the abridged thirteenth
edition, to the three summaries, the manual and their
use, and to the nature of the notation and operation of
the relative index. The seventh and eight chapters dis-
cuss the choice of the right number, by subject analy-
sis, determination of discipline, schedule scanning and
matching, with emphasis on the problems of interdis-
ciplinary subjects. There is also a brief chapter on the
citation order and the order of precedence of facets in
case of non-coextensive class numbers. Users are occa-
sionally referred to the text of the Abridged 13 for a
rule or an elaborate explanation. Chapters 9 to 13 are
devoted to number building, either through the
schedules or with any one of the four tables (the
abridged DDC has only the first four tables, omitting
the tables of national and ethnic groups, of languages,
and of persons). All chapters end with an exercise.
The last chapter is a review exercise. The appendix
provides answers and explanations for all the exer-
cises. Chapters have been divided into small sections
with feature headings. In the first two chapters, the
feature headings are in the form of well formulated
questions, e.g. "Which library classification do I need
for my library?", or "What is special about the Dewey
Decimal Classification?"

The workbook is a simple, concise, and user
friendly practical introduction to the use of the DDC
Abridged 13, with tips and expert advice for the learn-
ers on every page. That makes it a self learning text as
well as a teaching tool of high standard in the tradi-
tion of OCLC quality products.

M. P. Satija

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MIKAČI, Mira. **Teorijske Osnove Sustava za Pred-**
metno Označivanje (Theoretical Foundations of a
System for Subject Designation). Zagreb, Croatia:
Hrvatsko bibliotekarsko društvo, 1996. 435 p.
ISBN 953-6001-03-9.

This rather large book on subject indexing by Mira
Mikačić is the result of her twenty years of work in
subject indexing, her primary interest both as a
teacher in post-graduate studies at the Zagreb Univer-
sity, and also as collaborator to the National and Uni-
versity Library in Zagreb. The research was carried
out because the library, for which a new building had