

knowledge systems, whereas *terminology* and the conceptual forms on which it is based provide the structure that facilitates organization at all levels. Critical to his treatment of discourse as a function of communication is his analysis of *writing* and *spoken discourse*, not just as embodiments of knowledge and information systems, but rather as integral components of the thought process. Rather than being a product of the knowledge system, writing changes, develops, and systematizes knowledge structures.

Terminology, like the other elements in the model, is polycentric and polyfunctional in its organization. Although "common wisdom" would view terminology as a tool for representing knowledge and information, it should not be seen as a mere reflection of existing systems. Instead it comprises an element that constantly reorganizes and regenerates existing knowledge, giving rise to new knowledge elements and structures. Rather than representing a subsystem of any of the other elements, it more specifically constitutes a connective element that effectively permeates and links all layers in the system.

Having examined existing theoretical and methodological approaches to the primary components that comprise the system model and examined the role of modeling in modern scientific work (e.g., in physics, biology, engineering, and information science), Budin presents guidelines for implementing the theoretical modeling concept within the framework of an applied philosophy of science. In order to support a methodology for knowledge modeling, he provides a detailed checklist of general, structural, graphical, and holistic attributes that can be defined as components in a systematic model. In conclusion, Budin reviews current efforts to use computer applications for global knowledge modeling, specifically the creation of methods for metamodeling and the creation of data element dictionaries along the lines of the Basic Semantic Repository project.

The broad scope of this work is both a great strength and a potential danger. The many concrete examples of complex system models from all levels of the information and knowledge model, together with the two primary examples of complex, multilayered models offered by the author himself, offer the readers pragmatic guidance in developing their own models. In many respects, the book itself mirrors the multilayered, multifaceted knowledge organization that it describes, which may pose challenges for some readers. The recursion of overlapping views of the system shifts the focal plane to create a dynamic, kaleidoscopic panorama of ideas. The reviewer looks forward to the author's future development of practice-oriented methodologies for representing knowledge, particularly with respect to fields that are less easily approached than those subjects (such as engineering

and constitutive models) where computer-generated mathematical simulation has long provided graphic representation of complex systems.

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Dewey, Melvil. *Dewey Decimal Classification (Edition 21)* and relative index. Devised by Melvil Dewey. Editor, Joan S. Mitchell, et al. Albany, NY: Forest Press/OCLC, 1996. 4 Vols. ISBN 0-910-608-50-4. References: Chan, Lois Mai, et.al: *Dewey Decimal Classification: A Practical Guide*. 2nd ed., revised for DDC-21. Albany, NY:Forest Press, 1996 XVI, 246p.

Dewey Goes Hi-tech

The 21st edition of the Dewey Decimal Classification (DDC-21) was released in July 1996. This, despite the fact that the post of the chief editor remained vacant from November 1991 to March 1993 until Joan S. Mitchell took over in April 1993. Joan S. Mitchell is the 9th editor since Melvil Dewey (1851-1931), and succeeded John P. Comaromi (1937-1991), who died in November 1991. Well versed in the use of information technology, Mitchell is the former director of Educational Technology at Carnegie Mellon University. Prior to that she held a position at AT&T Bell Laboratories. Her first contact with the DDC organization dates to 1985 when she became a member of the DCEPC then held the position of chairperson from January 1992 to April 1993. The release of the DDC-21 has been possible due to the increasing use of information technology (IT) during the editing and production phase. As in the case of DDC-20 (1989), the editorial work for the DDC-21 was completed in electronic format with the Editorial Support System (ESS), a UNIX-based system developed by Inforonics, Inc. For more information, the OCLC/Forest Press home page <http://www.oclc.org> offers information on the DDC, including Dewey news, Dewey ALA report, and 'hot' classification topics.

For the first time the DDC-21 has been released simultaneously in two formats: the traditional print version (in 4 volumes), and the CD-ROM version now named Dewey, a LAN based compatible version of the electronic Dewey. In the CD-ROM version the hierarchy can be displayed and every class number is linked to four or five possible LC subject headings. The electronic edition has an augmented index with natural language terms taken from other thesauri to provide enhanced access to the expanded, relocated and discontinued numbers. The DDC-21, in the print format, offers four volumes with a total of 4126 pages

(DDC-20 had 3383) have been organized into nine sections:

A Prefatory texts and new features	vol. 1
B Introduction to the DDC	vol. 1
C Glossary	vol. 1
D Index to the introduction and glossary	vol. 1
E Seven Tables T1-T7	vol. 1
F Equivalence Table between the new and old	vol. 1
G Schedules	vol. 2-3
H Relative index	vol. 4
I Manual	vol. 4

Volumes 3(001-599) and 4(600-999) enshrine the schedules with a total of 23,000 entries. Unambiguous entries with ample notes are the major concern of the new edition. The DDC-21 is modern in structure, organization of classes and terminology, and of course, in physical format and outlook. Ease of use is reflected in brief and clear Editor's introduction. This edition has been carried forward with clear notes and improved captions. Many notes are also appended to entries in the schedules. There are 16 types of such notes divided into four categories. A new note explains the use of standard subdivisions in case of multiple term headings. For example, 531.4 Friction and viscosity of solids standards subdivisions are added for one or both topics in the headings. All of these notes provide adequate guidance in seemingly unclear situations. The H Manual, included at the end of Volume 4, has been expanded. Many numbers in the schedules and tables have been linked with the manual giving ample guidance and practical advise on choice of number for different areas based on practices of the Decimal Classification Division at the Library of Congress. There are frequent "see" manual references in the schedules, tables, and relative index that refer to the relevant portion of the manual for guidance and clarification. The manual also offers a theoretical analysis of schedules, tables and notes. For example, the manual divides all the standard subdivisions in 5 types A/F (pp.905-6 vol. 4). Many new notes have been added and all concepts in the manual have been indexed. The manual is highly illustrated with examples, flow charts, titles, DDC number, and clear citation order (E.g. pp.1171-1173, 1192 vol.4). In vol. 4 an appendix (pp.1205-7) has been added and includes policies of the Decimal Classification Division at the Library of Congress. Changes in the DDC-21, Manual A and H, are enormous and far reaching. Revisions slated for this edition have been announced, though unlike the previous edition no separate supplements have been issued between editions.

The major revisions in the schedules are for 296 Judaism, 297 Islam, 350-354 Public administration, 368 Insurance, 370 Education, and 560-570 Life Scien-

ces. Some select revisions have been made in 004-006 Data Processing, 200 Religion, 342-349 Branches of Law, 355 Military Science, 362-363 Social Problems, 420-490 Specific Languages, 636 Animal Husbandry, 790 Theater, 810-890 Literature of specific languages, and 940-990 General history of the Modern World. Area numbers for new nations have been incorporated. Table 6, Languages, has some changes, with minor changes in T1, and major revisions T5 and T7. The DDC-21 abounds in options in facet structure for local emphasis. For instance, under the subject Public Administration the citation order has been reversed from jurisdiction-topic to topic-jurisdiction, though through an option the Public Administration can be collocated by jurisdiction. There are many facet indicators to be used from the many internal tables. In the case of the Life Sciences 560-590, the major subdivision in 580-590 has remained the same but the facet formula has been changed from entity/process to process/entity. Newly revised classes 350-354, 560-590 and 780 make use of retroactive citation order. This is despite that additional order of precedence tables and optional numbers of A are given in parenthesis. For example, Public Administration of Justice in Russia 353.4 + 09 (T1)+47(T2) = 353.40947 (option A, Vol.2, p. 601) OR 351+47(T2)+●(Facet indicator)+34(from 353.4)= 351.470 34(option B). This indicates that the Public Administration can be collocated by country/state or by topic.

To conclude, the DDC-21 coupled with the CD-ROM version is a step above the DDC-20 (1989) by enhancing the readers' convenience, as an effective tool for the organization of knowledge in libraries, and as a subject access system in the electronic information environment. The DDC-21 is a nicely produced edition, but is not without some minor misprints and omissions. For example, the top running heading on right hand page of the Class 301-309 is Social Sciences instead of Sociology and Anthropology. Also, under the "add note" of 496.3904 the base number has been incorrectly printed as 491.804 instead of 496.3904, and under 325.33-39 the "add note" does not seem complete. However, these are minor typographical errors which do not tarnish the high quality of the DDC-21 printing and production.

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