

RELATIONSHIPS IN THE ORGANIZATION OF KNOWLEDGE

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RELATIONSHIPS IN THE ORGANIZATION OF KNOWLEDGE

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Introduction

Relationships abound in the library and information science (LIS) world. Those relationships may be social in nature, as, for instance, when we deal with human relationships among library personnel or relationships (i.e., “public relations”) between an information center and its clientele. The relationships may be educational, as, for example, when we examine the relationship between the curriculum of an accredited school and the needs of the work force it is preparing students to join. Or the relationships may be economic, as when we investigate the relationship between the cost of journals and the frequency with which they are cited. Many of the relationships of concern to us reflect phenomena entirely internal to the field: the relationship between manuscript collections, archives, and special collections; the relationship between end user search behavior and the effectiveness of searches; the relationship between access to and use of information resources; the relationship between recall and precision; the relationship between various bibliometric laws; etc. The list of such relationships could go on and on.

The relationships addressed in this volume are restricted to those involved in the organization of recorded knowledge, which tend to have a conceptual or semantic basis, although statistical means are sometimes used in their discovery. Despite this limitation to knowledge organization, the range of relationships relevant to our endeavor is extensive, including:

- The many types of bibliographic relationships between units of recorded knowledge;
- Various intratextual and intertextual relationships, including relationships based on text structure, citation relationships, and hypertext links;
- Subject relationships in thesauri and other classificatory structures, including the relationships involved in knowledge discovery; and
- Relevance relationships, including both topical relevance relationships and other user-oriented relevance relationships.

The careful reader will notice that these four categories are not necessarily mutually exclusive.

While knowledge organization has a rich interest in such relationships, the field has no monopoly on semantic associations. Relationships also play an integral role in other fields. For example, discrete mathematics addresses the formal properties of relations, which are defined as sets that express a correspondence between two or more sets; data modeling adopts these mathematical relations, but allows them to have a semantic interpretation (Tsichritzis & Lochovsky, 1982, p. 25). Such relations may express either entity classes (e.g., Companies, Persons, Products) or relationship classes (e.g., Student <enrolls in> Class, Supplier <supplies> Part <for> Project), which are associations between two or more entity classes. (Because “relation” has a technical meaning, we will reserve its use for mathematical and data modeling contexts and for such phrases as “public relations” and “phase relations.” Note that all relations are relationships, but not vice versa. We will

instead use the term “relationships” exclusively for the notion of semantic association, although the terms “relation” and “relationship” are often used interchangeably outside formal settings.) The ontologies of knowledge representation are also replete with relationships. Furthermore, linguistics has a firm interest in semantic relationships, both when words are considered out of context, where we speak of paradigmatic and lexical relationships, or in specific contexts, where we speak of syntagmatic and thematic relationships. A companion volume, *The Semantics of Relationships: An Interdisciplinary Perspective*, will address relationships in the broader arena.

Because subject relationships are at the very heart of the organization of knowledge, many of the papers in this volume address the topic in one form or another. Papers within the first part of the volume address subject relationships from a general and mostly scheme-independent perspective. Dextre Clarke cogently introduces the three basic thesaural relationships—equivalence, hierarchical, and associative—and briefly discusses the need for greater relational definition in automated contexts. Based on her extensive experience with standards-making, Milstead explains the process by which standards are developed and presents the current standards for thesauri and indexes, focusing on their treatment of relationships. A set of three papers follows, each of which examines subject relationships across contexts: Hudon addresses relationship compatibility in the multilingual thesaurus context, while Bodenreider and Bean explore problems involved in vocabulary integration within the domain of medicine for the *Unified Medical Language System (UMLS)*; Beghtol examines the cultural dependence of relational systems (where a culture may be defined by time, place, discipline, school of thought, etc.). Papers from the second part of the volume address the relational structure of several specific thesauri and classification schemes. El-Hoshy thoroughly explores the expression of relationships in the *Library of Congress Subject Headings (LCSH)*, while Molholt and Nelson, Johnston, and Humphreys do the same for the *Art & Architecture Thesaurus (AAT)* and *Medical Subject Headings (MeSH)* respectively. Each of these systems is highly conscious of the importance of relationships and deals with them in somewhat unique ways. Neelameghan introduces a new system, *OMIS*, which cuts across cultures and religious traditions and uses an extensive set of explicit associative (“lateral”) associations. Satija explores the role of relationships in the *Colon Classification (CC)*, while Mitchell addresses the relational structure of the *Dewey Decimal Classification (DDC)*.

Several other papers in the first part of the volume address relationships in knowledge organization other than subject relationships. The overview chapter by Green introduces relationships in knowledge organization, based on the four-way classification set out above; along the way, it acts as a guide to the literature of the area and situates the remaining chapters of the volume in a larger context. Tillett reviews her earlier work on bibliographic relationships and ties it together with the IFLA model that has emerged more recently. Bean and Green present a relationally-based view of relevance; in particular, topical relevance is argued to involve relationships beyond topic matching.

We are especially pleased that so many of our colleagues accepted the invitation to contribute to this volume. Their chapters reflect a wealth of experience with the development of knowledge organization systems, grounded in solid understanding of the more theoretical aspects of relationships. We have found their thoughts to be cogent and their writing incisive.

The chapters in this volume present a lively discussion of what we currently know about relationships in the service of knowledge organization, how they are used in current systems, both generally and specifically, and the challenges we face in identifying and making effective use of relationships. Many of the papers further address how a deeper understanding and use of relationships should beneficially affect knowledge organization in the future.

It is impossible for a volume of this nature to express all that needs to be considered and put forth at this time. But it will serve its purpose if it spurs further interest, debate, research, and development.

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