matter, greyed for prominence and worded with simple clarity. The ten-page index is skilfully constructed, detailed and user-friendly, not only pulling together the various, scattered references to different names but also including unique words in tables. This indexer is not afraid to provide entries with only one page number (deplorably forbidden by one of the reviewer's clients), or to use friendly wording in subheadings. The only quarrel I have is with the stiff binding: when open, a manual should lie flat without the user needing to bend the pages back 180 degrees and to use heavy paperweights.

Noeline Bridge, freelance indexer

ISO 25964-1: 2011 Information and documentation – Thesauri and interoperability with other vocabularies – Part 1: Thesauri for information retrieval. Geneva: International Organization for Standardization, 2011. 152 pp. CHF 238.00

In indexing and thesaurus creation there are standards, guidelines, best practices, conventions and so on, in which we professionals have been trained. We recognize their benefit in providing more usable and predictable indexes and thesauri, although we might not give much thought to how official such standards are. Official standards do exist for indexing, thesaurus creation, and other forms of information identification and description. They are created and published by non-governmental organizations, such as the British Standards Institution (BSI, www.bsigroup.com), the American National Standards Institute (ANSI) and its affiliate the National Information Standards Organization (NISO, www.niso.org), and most significantly the International Organization for Standardization (ISO, www.iso.org). These are not competing bodies: the authors of the guidelines produced by each of them often consult and collaborate with colleagues affiliated with other standards organizations to ensure the standards from different organizations are in harmony and do not contradict each other. In some cases the standards are identical (as in fact is the case with ISO 25964-1, which is published as the British Standard, BS ISO 25964-1:2011), which is the objective of standards.

The published standards for thesauri require greater attention by the practitioner than do the standards for creating indexes, because:

- thesaurus standards are impacted more by changes in technologies and hence require more frequent updating
- the reach and influence of a thesaurus is typically greater than that of a single index
- •fewer secondary sources exist from which to learn the standards of thesaurus creation.

Before we take a closer look at the latest thesaurus standard, some background on the International Organization for Standardization (ISO) is needed. ISO, founded in 1946 and headquartered in Geneva, Switzerland, is the world's largest developer and publisher of international standards. It functions as a network of the national standards institutes of its 163 member countries. ISO standards are based on international consensus among the experts in the field, who convene in various committees and subcommittees. The standards for thesauri, indexes, cataloging and similar information retrieval tools originate with the Subcommittee of Identification and Description, which is part of the Technical Committee for Information and Documentation. It takes several years of research, consultation, and review before a new standard is published.

ISO 25964-1 *Thesauri and interoperability with other vocabularies, Part 1: Thesauri for information retrieval* was published in August 2011, and the second part, ISO 25964-2 *Part 2: Interoperability with other vocabularies*, is still in draft form for review. According to its official abstract, 'ISO 25964-1:2011 gives recommendations for the development and maintenance of thesauri intended for information retrieval applications. It is applicable to vocabularies used for retrieving information about all types of information resources, irrespective of the media used.' ISO 25964-1 replaces a pair of earlier standards (ISO 2788:1986 *Guidelines for the establishment and development of monolingual thesauri* and ISO 5964:1985 *Guidelines for the establishment and development of multilingual thesauri*) and thus covers both monolingual and multilingual thesauri in one standard, with revisions. Furthermore, ISO 25964-1 adds four more chapters (for a total of 17) that cover new material.

Chapters, or 'clauses,' which were also in the previous editions include those for thesaurus purpose, the notion on concepts, thesaurus term style, complex concepts and compound terms, equivalence relationships, hierarchical relationships and associative relationships (including customized relationships), facets, display and layout, and thesaurus management and maintenance. New chapters in this standard cover thesaurus software design guidelines, data modeling, applications integration, exchange formats, and protocols.

ISO 25964-1 is an excellent reference. It is highly structured with three-level decimal headings, and easily readable with short paragraphs that go straight to the point combined with numerous illustrative examples. In addition to English-language examples, there are often second examples in French, and for multilingual issues German and Spanish examples are added. The standard has a detailed glossary (noticeably at the beginning, not the end of the document), which even includes examples of terms. There is a table of symbols and abbreviations (such as BT – broader term, NT – narrower term, SN – scope note), and a table of these English language tag abbreviations and their equivalents in nine other languages. Examples of displays and screenshots of actual thesauri are collected in an appendix. The publication also has a good-quality and generous index of nine pages of three columns covering the 121 indexable pages (excluding appendices).

As the merged result of two separate standards, for monolingual (English) and multilingual thesauri, there obviously has been considerable reorganization to present the topics and examples in a logical integrated manner. For example, rules on the use of plural for count nouns apply to some languages (English and Spanish) and not for others. There are also separate chapters for the equivalence relationship in monolingual thesauri and the equivalence relationship in multilingual thesauri. It is not only convenient to have standards for both monolingual and multilingual thesauri in a single document, it also helps to promote the understanding of multilingual thesauri among information professionals who might not otherwise have considered their use.

If we exclude the multilingual coverage and some added sections, ISO 25964-1 is quite similar to the corresponding US standard, ANSI/NISO Z 39.19-2005 *Guidelines for the Construction, Format, and Management of Monolingual Controlled Vocabularies* (revised most recently in 2010). The coverage of purpose, concepts, term style, compound terms, term relationships, and displays is nearly the same in both, with only minor variations in the explanations and, of course, different examples. In this way the two standards actually complement each other in providing the reader with the most thorough explanation. For example, I find the explanation of complex concepts in ISO 25964-1 stronger and more compelling than the comparable chapter on compound terms in ANSI/NISO Z 39.19. The most notable difference is that ISO 25964-1 is about thesauri, whereas ANSI/NISO Z 39.19 addresses other kinds of controlled vocabularies, something which we can assume is covered in the forthcoming Part 2, ISO 25964-2. In most cases this distinction has little impact on the topics covered, although ISO 25964-1

does not go into such great detail on displays as ANSI/NISO Z 39.19 does, since the latter must cover displays for different kinds of controlled vocabularies.

The added chapters are what indexers and taxonomists would consider the technical side of thesauri. One chapter provides guidelines for the features one should include when developing thesaurus management software. Another chapter outlines the structure of data in the thesaurus as a data model and illustrates this with a complex diagram using Unified Modeling Language (UML) conventions, which I can only hope to understand part of. A third added chapter is about integration of thesauri with applications, such as indexing and search. This is a most important and welcome addition to the standards, because thesauri do not live in isolation. The final sections mention exchange formats (such as MARC, SKOS, and ZThes) and database protocols. Even if I cannot follow all the details, I have something to which to direct the technical implementer.

In addition to providing guidance for the professional thesaurus creator/editor, ISO 25964-1 also provides useful definitions and explanations for the professional seeking to explain thesauri and taxonomies to others. The explanations are clear and concise, in addition to being authoritative. For example, 'The traditional aim of a thesaurus is to guide the indexer and the searcher to choose the same term for the same concept' (p 15).

Although I consider myself an expert on thesauri and taxonomies, I still learned new concepts from even the earlier chapters of this document. For example, while I understood the concept, I had not previously heard of 'paradigmatic' versus 'syntagmatic' relationships. Paradigmatic relationships are relationships between concepts that are valid in almost all contexts, whereas syntagmatic relationships are the relationships of two concepts because they occur together in the context of a particular document. This distinction is not addressed in ANSI/NISO Z 39.19, and it is indeed important, especially since the creation of related terms (associative relationships) can be quite tricky.

Although ISO 25964-1 may not be within the budget of the independent contractor or freelancer (at 238 Swiss francs/£164/US$260), it should be an indispensable source in the library of any organization that builds and creates thesauri, whether for internal document management or for the publication of information resources. It is also an important resource for any individual who teaches, consults, or writes within the field of thesauri and taxonomies.

Heather Hedden, taxonomy consultant and instructor

Introduction to information science and technology. C. H. Davis and D. Shaw (eds). Medford, NJ: Information Today, Inc., 2011. 288 pp. ISBN 978-1-57387-423-6 (pbk) US$59.50.

A wiki is a website where users can add, delete or modify content resulting in a document that was created collaboratively. As such it is the collective offspring of all of its contributors. The most notable wiki is Wikipedia, which has evolved over the years to be a dependable source of information on the Internet. This book, *Introduction to information science and technology*, is the result of a wiki effort between the editors, Charles H. Davis and Debora Shaw, and many contributors too numerous to list here. The book is intended to be an introductory textbook to the field of information technology, and as such, the chapters will be described here.

With the advent of computers, digital information and the Internet, information technology has become an increasingly important part of our daily lives. In the United States alone, an estimated 3.6 zetabytes of information (that's 10^{21} bytes) were consumed at home in 2008. If printed in books, that information