Preface

Current search paradigms for the Web, direct access through search engines and navigational access via static taxonomies, have recently been strongly criticized. A third paradigm, dynamic taxonomies or faceted search, is gaining acceptance to the extent that it is now the de facto standard in product selection for e-commerce.

This new paradigm is based on a simple and easily understood visual environment which supports both direct access and guided exploration of complex information bases. While focusing on structured, guided exploration, it also bridges the gap between traditional querying and browsing. In general, query services are either too simplistic (e.g. free text queries in IR systems or Web search engines), or too complex for casual users (e.g. SQL queries, or Semantic Web queries). Browsing as well, is either too simplistic (e.g. "plain" Web links) or application specific (dynamic pages derived by specific application programs), and does not support conceptual exploration.

Dynamic taxonomies work on multidimensional taxonomies (usually organized by facets) and provide a single, coherent visual framework in which users can focus on one or more concepts in the taxonomy, and immediately see a conceptual summary of their focus, in the form of a reduced taxonomy derived from the original one by pruning unrelated concepts. Concepts in the reduced taxonomy can be used to set additional, dependent foci and users iterate in a guided yet unconstrained way until they reach a result set sufficiently small for manual inspection.

The access paradigm supported is a conceptual exploration, far more frequent in "search" tasks than the retrieval by exact specification supported by search engines and database queries. The underlying model is simple and easily understood by users, offers substantial benefits over traditional approaches, and has an extremely wide application range, and a potential for important extensions. Dynamic taxonomy/faceted search is a heavily interdisciplinary area, where data modeling, human factors, logic, inference, and efficient implementations must be considered holistically.

The goal of this book is to provide a complete and clear guide to all of the relevant aspects of dynamic taxonomies and faceted search. These include modeling, user interaction, taxonomy design, system implementation, and performance. The primary audience for this book are university students, professionals, and researchers in computer science and computer engineering who are interested in understanding and applying dynamic taxonomies, possibly in combination with other access methods, in real environments. The book may be of interest also to university students, professionals and researchers in Library and Information Science.

The book is organized as follows. Chapter 1 introduces dynamic taxonomies and faceted search. Chapter 2 formally describes faceted taxonomy-based sources. In

Chap. 3, dynamic taxonomies and faceted search are compared to other techniques including information retrieval, OLAP, dynamic result clustering, static taxonomies, decision trees, formal concept analysis, description logics, and the Semantic Web. Chapter 4 is devoted to user interface design and issues, and includes an analysis of information presentation, interaction modes, user interface design patterns, and personalized faceted search. Chapter 5 introduces important extensions to the base model, addressing data mining, structured documents, and extended expressivity through logical information systems. Chapter 6 discusses several engineering aspects of taxonomy-based sources including the integration of different and distributed taxonomy-based sources. Chapter 7 describes guidelines for schema design and the automatic construction of dynamic taxonomy schemata from textual information sources. System implementation issues are discussed in Chap. 8. Chapter 9 analyzes current and emerging application areas, including e-commerce, multimedia, e-government, human resource management and diagnostic systems. Finally, Chap. 10 synopsizes and identifies challenges and directions for further research.

Color reproductions for selected figures are included at the end of the book. These figures are referenced with a trailing C, e.g. 9.15C.

The following table cross-references some relevant topics that readers might be familiar with.

Aspect/Topic	Chapters and Sections
Real-World Applications	Chap. 8 (8.3.1), 9
Formal Concept Analysis (FCA)	Chap. 3 (3.4)
Text-Based Information Retrieval	Chap. 3 (3.1.2), 7 (7.2), 8 (8.3.1)
Web Searching	Chap. 3 (3.1.2), 8 (8.3.1)
Logics and Semantic Web	Chap. 3 (3.5), 5 (5.4, 5.5), 8 (8.5, 8.4)
Databases and OLAP	Chap. 3 (3.1), 7 (7.1.1.2), 8 (8.2)
(Graphical) User Interfaces	Chap. 4, 9
Mathematical Foundations	Chap. 2, 3, 5, 6, 8 (8.5)
Facet Analysis	Chap. 2 (2.3), 7 (7.1)

Additional and accompanying material is (and will be) available through the editors' web pages.[1]

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[1] http://www.di.unito.it/~sacco/dt-book, http://www.ics.forth.gr/~tzitzik/fbook/.