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This chapter describes OpenDLib, a Digital Library Service system developed at ISTI-CNR to support the
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Esther O.A. Fatuyi, Elsie Whitlow Stokes Community Freedom Public School, USA

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   David A. Garza-Salazar, Tecnológico de Monterrey, Mexico

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Schubert Foo, Nanyang Technological University, Singapore
Dion Hoe-Lian Goh, Nanyang Technological University, Singapore

This chapter addresses the issues of resource discovery and the importance of using knowledge organization tools to build digital libraries. A prototype Taxonomy Generation Tool, utilizing a hierarchical classification of contents by subjects, was designed and built to categorize contents in the Greenstone Digital Library software. The taxonomy template supports controlled vocabulary terms and allows users to select the labels for the taxonomy structure.

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Dion Hoe-Lian Goh, Nanyang Technological University, Singapore
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This chapter demonstrates how digital archives, and in particular, its derivative in the form of virtual exhibitions can be developed using the multimedia digital contents of the archives. It presents a number of concepts and design considerations and illustrates this with a proposed generic system architecture that encapsulates the important issues of metadata, system architecture design, and developmental techniques for creating effective and usable virtual exhibitions.

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John H. L. Hansen, Center for Robust Speech Systems (CRSS), Erik Jonsson School of Engineering and Computer Science, University of Texas at Dallas, USA

This chapter describes a number of advances in formulating spoken document retrieval for the National Gallery of the Spoken Word (NGSW) and the U.S.-based Collaborative Digitization Program (CDP). Their experimental online system called “SpeechFind” is presented, which allows for audio retrieval from the NGSW and CDP corpus.

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Mara Nikolaidou, Harokopio University of Athens, Greece

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Neide Santos, Universidade do Estado do Rio de Janeiro, Brazil
Fernanda C. A. Campos, Universidade Federal de Juiz de Fora, Brazil
Regina M. M. Braga Villela, Universidade Federal de Juiz de Fora, Brazil

This chapter describes a digital library for the e-learning domain which main service is a search engine that retrieves information by tracing the domain vocabulary met on ontology. The digital library extends Web portal’s functionalities, providing technical information and communication and collaboration spaces, and hosts a wide variety of information. It provides services for cataloging, storing, searching, and retrieving information, based on ontology-based semantic queries.

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Modern information and communication technologies (ICT) introduce new publication forms and services in the area of scholarly communication, which seem to enable a faster and more cost efficient distribution of research results. This chapter presents a classification scheme which aims to allow describing new forms of scholarly communication in a standardized way.

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Stefano Paolozzi, Consiglio Nazionale delle Ricerche, Italy
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This chapter describes multimodality as a means of augmenting information retrieval activities in multimedia digital libraries. Multimodal interaction systems combine visual information with voice, gestures, and other modalities to provide flexible and powerful dialogue approaches. The authors propose a new approach to match a multimodal sentence expressed by the user with a template stored in a knowledge base to interpret the multimodal sentence and define the multimodal templates similarity.

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Ana Kovacevic, University of Belgrade, Serbia
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Yin-Leng Theng, Nanyang Technological University, Singapore
Schubert Foo, Nanyang Technological University, Singapore
Paul Horng-Jyh Wu, Nanyang Technological University, Singapore

This chapter introduces word segmentation methods for Indo-China languages. It describes six different word segmentation methods developed for the Thai, Vietnamese, and Myanmar languages, and compare different approaches in terms of their algorithms and results achieved. It provides underlying views about how word segmentation can be employed in Indo-China languages to support search functionality in digital libraries.

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Dion Hoe-Lian Goh, Nanyang Technological University, Singapore
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Chei Sian Lee, Nanyang Technological University, Singapore
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This chapter explores the effectiveness of social tags as resource descriptors. Social tags are freely selected terms by users to resources, and shared among other users. Two text categorization experiments via Support Vector Machines (SVM) were done for this research. The first study concentrated on the use of terms as its features, while the second used both terms and its tags as part of its feature set.

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Taha Osman, Nottingham Trent University, UK
Dhavalkumar Thakker, Nottingham Trent University, UK
Gerald Schaefer, Aston University, UK

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Emanuele Panizzi, University of Rome “La Sapienza,” Italy
Tiziana Catarci, University of Rome “La Sapienza,” Italy
Margerita Antona, FORTH-ICS, Greece

This chapter describes a questionnaire-based study covering a wide range of issues pertinent to the design of user interfaces for DLs, including: user characteristics/profiles, current experience in DL usage, functional requirements, nonfunctional requirements, and contextual requirements.

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Luz Marina Alvaré, International Food Policy Research Institute (IFPRI), USA
Cecilia Ferreyra, International Potato Center (CIP), Peru
Peter Shelton, International Food Policy Research Institute (IFPRI), USA

This chapter introduces the Consultative Group on International Agricultural Research (CGIAR) Virtual Library as a tool linking researchers and agricultural research results. The CGIAR is a strategic alliance of countries, international and regional organizations, and private foundations supporting 15 international agricultural Centers that work in partnerships with national agricultural research institutions and societies. The chapter explains their work, and discusses implications to the design of virtual libraries.
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  Hideyasu Sasaki, Ritsumeikan University, Japan

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  Hepu Deng, RMIT University, Australia

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  Gerald Schaefer, Aston University, UK
  Simon Ruszala, Teleca, UK
Following the ever-growing sizes of image databases, effective methods for visualising such databases and navigating through them are much sought after. These methods should provide an “overview” of a complete database together with the possibility to zoom into certain areas during a specific search. It is crucial that the user interacts in an intuitive way with such a system in order to effectively arrive at images of interest. In this chapter, several techniques are presented that allow for effective browsing and navigation of large image databases.

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Cláudio de Souza Baptista, University of Campina Grande, Brazil
Ulrich Schiel, University of Campina Grande, Brazil

This chapter presents a multimedia digital library that copes with the storage and retrieval of resources of different media such as video, audio, maps, images, and text documents. The main improvement with regard to textual digital libraries is the possibility of retrieving documents in different media combining metadata and content analysis. We discuss the problems and solutions associated each media.

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Nuria Lloret Romero, Polytechnic University of Valencia, Spain
Margarita Cabrera Méndez, Polytechnic University of Valencia, Spain
Alicia Sellès Carot, Masmedios Ltd., Spain
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The Biblioteca Valenciana was created to meet, conserve, and provide access to the Valencian bibliographic inheritance and all the printed, sound, and visual production, about the Comunidad Valenciana. To support this work, the Biblioteca Valenciana has embarked on the design and implementation of a digital library project, the Biblioteca Valenciana Digital (BIVALDI). This chapter describes this endeavour, as well as discusses the unique challenges associated with the project.

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Rubén Béjar, University of Zaragoza, Spain
J. Nogueras-Isa, University of Zaragoza, Spain
Miguel Ángel Latre, University of Zaragoza, Spain
Pedro Rafael Muro-Medrano, University of Zaragoza, Spain
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This chapter introduces Spatial Data Infrastructures (SDI) and establishes their strong conceptual and technical relationships with geographic digital libraries (geolibraries). The authors describe the origin of SDIs, and highlight their role as geographic resources providers. The chapter also discusses the key differences between SDIs and geolibraries, in order to provide a broader view of these infrastructures.
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J. Nogueras-Iso, University of Zaragoza, Spain
F. J. Zarazaga-Soria, University of Zaragoza, Spain

Challenges remain in serving users of Digital Libraries (DL) and Geographic Information (GI) services. This is due to the proliferation of different representation formats, proprietary standards, protocols, and platforms in which information is published. In this chapter, we share some of the lessons learned during architectural design and standardization activities carried out in the GI domain.

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Piedad Garrido Picazo, University of Zaragoza, Spain
Jesús Tramullas Saz, University of Zaragoza, Spain
Manuel Coll Villalta, University of Zaragoza, Spain

This chapter introduces Digital Libraries as a means of cultural heritage access and diffusion. It argues that Digital Libraries, combined with superimposed information techniques, offer a potentially more substantive approach to understanding the historical documentation analysis problem. The chapter also discusses how techniques such as agents, information management, and information visualization can be incorporated to implement a versatile digital library that meets the cultural heritage information needs of users need.

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Wan Ab. Kadir Wan Dollah, MARA University of Technology, Malaysia
Diljit Singh, University of Malaya, Malaysia

Rapid development in information and communication technologies have significantly influenced both the way libraries provide information services to their users and the way they choose to access information. Digital reference services are thus gaining popularity especially in academic and public libraries. This chapter discusses how such services can play a vital role in terms of providing personalized assistance to library users in accessing resources to meet their information needs.

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Alan O. Allwardt, ETI Professionals, USGS Pacific Science Center, USA

This chapter describes the design and implementation of three related digital libraries developed by the U.S. Geological Survey for topical and georeferenced information for coastal and marine science: the Marine Realms Information Bank (MRIB) and its two offshoots, the Monterey Bay Science Digital Library and Coastal Change Hazards Digital Library. The chapter also discusses important challenges facing digital library developers.
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Stephan Strodl, Vienna University of Technology, Austria
Christoph Becker, Vienna University of Technology, Austria
Andreas Rauber, Vienna University of Technology, Austria

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Gerald Schaefer, Aston University, UK

Compressed domain techniques are becoming increasingly important in processing or retrieving image without prior decompression. In this chapter, we show that such midstream content access is possible, and present a compressed domain retrieval methods based on a visual pattern compression algorithm. Experiments conducted on a medium sized image database demonstrate the effectiveness and efficiency of the presented approach.

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Thomas Lidy, Vienna University of Technology, Austria
Andreas Rauber, Vienna University of Technology, Austria

This chapter provides an overview of the increasingly important domain of Music Information Retrieval, which investigates efficient and intelligent methods to analyze, recognize, retrieve, and organize music. The chapter describes the background and problems that are addressed by research, and introduces methods for the extraction of semantic descriptors from music. Next, music retrieval, music classification, and music library visualization systems are described.

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Juha Kettunen, Turku University of Applied Sciences, Finland

This chapter describes the cooperation of academic libraries and the consortium of digital libraries of Finnish universities of applied sciences. It argues that it is necessary to adopt networking and cooperative strategies among libraries to provide electronic services of users. The findings of this chapter are useful to administrators of educational institutions aiming to plan a networked strategy and improve the cost-efficient cooperation of otherwise independent organizations.

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Leonardo Bermón-Angarita, Carlos III University of Madrid, Spain
Antonio Amescua-Seco, Carlos III University of Madrid, Spain
Maria Isabel Sánchez-Segura, Carlos III University of Madrid, Spain
Javier García-Guzmán, Carlos III University of Madrid, Spain
This chapter establishes the incorporation of Knowledge Management techniques as a means to improve actual software process asset libraries. It presents how Knowledge Management contributes to the creation of a new generation of process libraries as repositories of knowledge as well as the mechanisms to allow the acquisition, storage, collaboration, sharing, and distribution of knowledge related to the software development processes.

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*Han Lee Yen, Nanyang Technological University, Singapore*

Educators and learners have long relied on libraries as their main sources of learning resources and libraries have in turn provided the infrastructure that promotes the creation, assimilation, and leverage of knowledge. However, with the growth of e-learning in recent years, libraries are facing new challenges to the way they develop, manage, and deliver their services and resources to their users. This chapter discusses how libraries can meet these challenges by providing electronic or partially electronic services.

**Chapter L**

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*Kanwal Ameen, University of the Punjab, Lahore, Pakistan*

*Muhammad Rafiq, Government College University Lahore, Pakistan*

This chapter aims to discuss the development of digital libraries in Pakistan. It gives an account of the digital transformation taking place in the country and reviews a few digital library initiatives. It discusses a number of issues associated with the development of digital libraries with specific reference to Pakistan. The major issues appear are as follows: misconception about digital libraries; lack of technological applications; lack of human resources with needed skills; copyright and publishing; cultural divide; digital divide; and insufficient financial support. The authors believe that understanding the underlying issues will not only accelerate the development of DL in Pakistan, but also in other developing countries with more or less common environment.

**Section V**

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*Seungwon Yang, Digital Library Research Laboratory, Virginia Tech, USA*

*Barbara M. Wildemuth, University of North Carolina at Chapel Hill, USA*

*Jeffrey P. Pomerantz, University of North Carolina at Chapel Hill, USA*

*Sanghee Oh, University of North Carolina at Chapel Hill, USA*

*Edward A. Fox, Digital Library Research Laboratory, Virginia Tech, USA*

This chapter presents the effort of developing a digital library (DL) curriculum by an interdisciplinary group from Virginia Tech and the University of North Carolina at Chapel Hill. It describes the foundations of the curriculum building, the DL curriculum framework, the DL educational module template, a list of draft modules that are currently developed and evaluated by multiple experts in the area, and more details about the resources used in the draft modules and DL-related workshop topics mapped to the DL curriculum framework.
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Digital Libraries as Centres of Knowledge: Historical Perspectives from European Ancient Libraries

Natalie Pang, Monash University, Australia

This chapter focuses on the core role of libraries as centres of knowledge using historical perspectives from ancient libraries in Europe. The ways technological and social contexts have been adapted in ancient libraries are discussed. This chapter contributes to a collective understanding of immediate and future directions of libraries, their challenges and promises, and how they have evolved as places for local communities.

Chapter LIII
The European Approach Towards Digital Library Education: Dead End or Recipe for Success?

Wolfgang Ratzek, Stuttgart Media University, Germany

With the rapid development of effective and efficient information and communication technology (ICT) and the vital change of patron behavior, a library cannot offer its services without qualified staff. Thus, this chapter describes the LIS (library and information science) educational and training programs in Europe, especially in Germany, Great Britain, and the Nordic Countries.

Chapter LIV
New Roles of Digital Libraries

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Holly Devaul, Digital Learning Sciences, USA

This chapter proposes the future of digital libraries (DLs) in terms of the support provided for the end users and distributed computer applications. The authors briefly present their methodology for systematically exploring the future of DLs, and then highlight some of the roles a DL can play to support its diverse set of users. A new breed of consumer is introduced with discussion on how DLs can provide support to this consumer group.

Chapter LV
A Review of Progress in Digital Library Education

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Warwick Clegg, Victoria University of Wellington, New Zealand
Ann O’Brien, Loughborough University, UK

This chapter reviews the history, development, and current status of digital library (DL) courses and programmes now being offered, mainly by universities/institutions with accredited programmes or courses by CILIP (the Chartered Institute of Library and Information Professionals) and ALA (American Library Association). Trends in digital library education (DLE) are also presented.

Chapter LVI
The Future of Learning with Digital Libraries

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John G. Hedberg, Macquarie University, Australia

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   Michael B. Twidale, University of Illinois, USA
   David M. Nichols, University of Waikato, New Zealand

This chapter presents the role of technology in digital library education. It investigates how elements of computer science and library science can be merged to produce an appropriate “computational sense” for future digital librarians. The discussion in this chapter aims to inform the development of digital library software tools—particularly those used in educational contexts.

Chapter LVIII
Digital Libraries Overview and Globalization ............................................................... 562
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This chapter presents an overview of how national libraries of 14 countries in Asia-Pacific region are involving in the digital library initiatives. Most libraries participate in the collaborative efforts to build the digital libraries with the support from their government. With the understanding of the current situation in Asia Pacific, the reader can understand the readiness of national libraries aiming for globalization.

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