
INFO 202 — Project 2: Design Vocabulary for Target User Group

Your names: [REDACTED], & Jax Skorich

Preparation: Target User Description

The concept of the public library as just a large, dusty storehouse of books is obsolete. While the circulation of books is an important aspect, libraries have evolved over the years now serving as “community anchors” that provide “lifelong learning, civic engagement, youth services, health and wellness, workforce development, technology and access, and supporting social infrastructure” (Freudenberger, 2022, p. 115). As the roles of the public library evolved, the skills and competencies required of a librarian to lead them followed suit. A student who decides to pursue the LIS career path of public librarianship must develop these skills to become an effective librarian and there are three main avenues to achieve this, professional experience, formal education, and research; the design of this vocabulary will look at supporting the latter. The records chosen represent some of the most important skills and competencies that a student of LIS will need to be successful in public librarianship. These students will need to have an understanding of the types of information retrieval systems, strategies for user research, ways to evaluate information retrieval systems, how to design for search, and what searching looks like. Accompanied with these records are assigned descriptors that were crafted carefully to not only represent what the article is about but also the information needs of the target user.

Reference

Freudenberger, (2022). Community anchors for lifelong learning: Public libraries. In S. Hirsh (Ed.), *Information services today: An introduction* (3rd ed., 113-126). Rowman & Littlefield.

Worksheet 1: Identify central concepts. (Step 1)

	RECORDS Paste in your 9 records.	MOST IMPORTANT CONCEPTS List <u>no more than 8 terms</u> for the main concepts.
1	<p>Bates, Marcia. (1999). The invisible substrate of information science. <i>Journal of the American Society for Information Science</i>, 50(12), 1043-1050.</p> <p>The explicit, above-the-water-line paradigm of information science is well-known and widely discussed. Every disciplinary paradigm, however, contains elements that are less conscious and explicit in the thinking of its practitioners. Elucidates the key elements of the below-the-water-line portion of the information science paradigm. Highlights the role of information science as a meta-science: conducting research and developing theory around the documentary products of other disciplines and activities. Views the mental activities of the professional practice of the field as centering around representation and organization of information, rather than knowing information. Argues that such representation</p>	<p>Information Science Representation Organization Meta-science Information Retrieval Librarianship Theory</p>

	<p>engages fundamentally different talents and skills from those required in other professions and intellectual disciplines. Also considers methodological approaches and values of information science.</p>	
2	<p>Agosto, Denise E. & Hughes-Hassell, Sandra (2005, Spring). People, places, and questions: An investigation of the everyday life information-seeking behaviors of urban young adults. <i>Library & Information Science Research</i>, 27(2), 141-163.</p> <p>This article presents preliminary findings from a research grant on the everyday life information-seeking (ELIS) behaviors of urban young adults. Twenty-seven teens aged 14 through 17 participated in the study. Qualitative data were gathered using written activity logs and semi-structured group interviews. A typology of urban teens' preferred ELIS sources, media types, and query topics is presented. The typology shows friends and family as preferred ELIS sources, cell phones as the preferred method of mediated communication, and schoolwork, time-related queries, and social life as the most common and most significant areas of ELIS. The results indicate a heavy preference for people as information sources and that urban teens hold generally unfavorable views of libraries and librarians. The conclusion lists questions that information practitioners should consider when designing programs and services for urban teens and calls for researchers to consider this often-ignored segment of the population as potential study participants.</p>	<p>Urban Young Adults Everyday life information-seeking Communication preferences Information sources Library perception Representation in Literature Collaboration</p>
3	<p>Elings, Mary W. & Waibel, Gunter (2007, March 5). Metadata for all: Descriptive standards and metadata sharing across libraries, archives, and museums. <i>First Monday</i>, 12(3). Retrieved from http://www.firstmonday.org/</p> <p>Integrating digital content from libraries, archives and museums represents a persistent challenge. While the history of standards development is rife with examples of cross-community experimentation, in the end, libraries, archives and museums have developed parallel descriptive strategies for cataloguing the materials in their custody. Applying in particular data content standards by material type, and not by community affiliation, could lead to greater data interoperability within the cultural heritage community.</p> <p>In making this argument, the article demystifies metadata by defining and categorizing types of standards, provides a brief historical overview of the rise of descriptive standards in museums, libraries and archives, and considers the current tensions and ambitions in making descriptive practice more economic [1].</p>	<p>Metadata Interoperability Cataloguing Standards Museums Libraries Archives Collection aggregation</p>

4	<p>Bates, Marcia J. (1998, November). Indexing and access for digital libraries and the internet: Human, database, and domain factor. <i>Journal of the American Society for Information Science</i>, 49(13), 1185-1205.</p> <p>Presents information on a study which looked at indexing and access to digital libraries and the Internet. Factors important in the design of access mechanisms; Skills of an indexer; Reference to previous literature; Information on folk classification.</p>	<p>Index Digital library Resource Accessibility User experience Human factors Subject vocabulary Recognition Integration</p>
5	<p>Agosto, Denise E., Kuhlmann, L. Meghann, Pacheco Bell, J., & Bernier, Anthony. (May/June 2014). Learning from librarians and teens about YA library spaces. <i>Public Libraries</i>, 53(3), 24-28.</p> <p>The article discusses the results of the empirical study of the physical and spatial aspects of young adult (YA) library services in the U.S. as of May 2014. Topics highlighted include ways for public libraries to improve their library services for YA users, the need for design revisions to adapt to how users are using and interacting with their libraries and analysis of video data gathered during the study. Also mentioned is the importance of access to technology for YA users.</p>	<p>Public Libraries Library Services Library Spaces Young Adult Teenagers Technology Case Study</p>
6	<p>Bates, Marcia J. (2007, October). What is browsing—really? A model drawing from behavioural science research. <i>Information Research</i>, 12(4). Retrieved from http://www.informationr.net/ir/12-4/paper330.html</p> <p>Introduction. It is argued that the actual elements of typical browsing episodes have not been well captured by common approaches to the concept to date.</p> <p>Method. Empirical research results reported by previous researchers are presented and closely analysed.</p> <p>Analysis. Based on the issues raised by the above research review, the components of browsing are closely analysed and developed. Browsing is seen to consist of a series of four steps, iterated indefinitely until the end of a browsing episode: 1) glimpsing a field of vision, 2) selecting or sampling a physical or informational object within the field of vision, 3) examining the object, 4) acquiring the object (conceptually and/or physically) or abandoning it. Not all of these elements need be present in every browsing episode, though multiple glimpses are seen to be the minimum to constitute the act.</p> <p>Results. This concept of browsing is then shown to have persuasive support in the psychological and anthropological literature, where research on visual search, curiosity and exploratory behaviour all find harmony with this perspective.</p> <p>Conclusions. It is argued that this conception of browsing is closer to real human behaviour than other approaches.</p> <p>Implications for better information system design are</p>	<p>Information Seeking Behavior Human Behavior Psychology Browsing Information System Design Research</p>

	developed.	
7	<p>De Sabbata, S., Mizzaro, S., & Reichenbacher, T. (2015). Geographic dimension of relevance. <i>Journal of Documentation</i>, 71(4), 650-666. doi: 10.1108/JD-12-2013-0167</p> <p>King Library permalink: https://sjsu-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=TN_emerald_s10.1108/JD-12-2013-0167&context=PC&vid=01CAL_SJO&search_scope=EVERYTHING&tab=everything&lang=en_US</p> <p>Purpose – The purpose of this paper is to discuss the emerging geographic features of current concepts of relevance, and to improve, modify, and extend the framework proposed by Mizzaro (1998). The objective is to define a new framework able to account, more completely and precisely, for the notions of relevance involved in mobile information seeking scenarios.</p> <p>Design/methodology/approach – The authors formalise two new dimensions of relevance. The first dimension emphasises the spatio-temporal nature of the information seeking process. The second dimension allows us to describe how different concepts of relevance rely on different abstractions of reality.</p> <p>Findings – The new framework allows: to conceptualise the point in space and time at which a given notion of relevance refers to; to conceptualise the level of abstraction taken into account by a given notion of relevance; and to include widely adopted facets (e.g. users mobility, preferences, and social context) in the classification of notions of relevance.</p> <p>Originality/value – The conceptual discussion presented in this paper contributes to the future development of relevance in the scope of mobile information seeking scenarios. The authors provide a more comprehensive framework for conceptualization, development, and classification of notions of relevance in the field of information retrieval and location-based services.</p>	<p>Information Seeking Behavior Information Retrieval Mobile Based Services Geographical Relevance Classification</p>
8	<p>Tucker, V.M. & Edwards, S.L. (2021). Search evolution for ease and speed: A call to action for what's been lost. <i>Journal of Librarianship and Information Science</i>, 53(4), 668-685. doi.org/10.1177/0961000620980827</p> <p>In recent years, leading website search engines have abandoned vital search features supporting complex information needs, evolving instead for the marketplace and for users seeking speedy answers to easy questions. The consequences are troubling, for researchers and for information science educators, with concerns ranging from the very relevance of search results and the unknowing of what is missing, to the novice searcher's waning ability to frame potent queries and to learn ways to refine results.</p>	<p>Search Engines Information behavior Information Needs Search Interface Search theory interface Design</p>

	<p>We report on a grounded theory study of search experiences of information professionals and graduate students (n=20) that contributes a holistic understanding of web searching, using its findings both to frame what is lacking in the design evolution of search engines for complex information needs and to outline a way forward. The study's implications coalesce in a call to action for more inclusive search interface design, and an agenda is put forth for how information researchers, educators, and literacy advocates can move forward in their intersecting domains.</p>	
9	<p>Mat-Hassan, Mazlita & Levene, Mark (2001, September 3). Can navigational assistance improve search experience? A user study. <i>First Monday</i>, 6(9). Retrieved from http://www.firstmonday.org/.</p> <p>Providing navigational aids to assist users in finding information in hypertext systems has been an ongoing research problem for well over a decade. Despite this, the incorporation of navigational aids into Web search tools has been slow. While search engines have become very efficient in producing high quality rankings, support for the navigational process is still far from satisfactory. To deal with this shortcoming of search tools, we have developed a site specific search and navigation engine that incorporates several recommended navigational aids into its novel user interface, based on the concept of a user trail. Herein, we report on a usability study whose aim was to ascertain whether adding semi-automated navigational aids to a search tool improves users' experience when "surfing" the Web. The results we obtained from the study revealed that users of the navigation engine performed better in solving the question set posed than users of a conventional search engine. Moreover, users of the navigation engine provided more accurate answers in less time and with less clicks. Our results indicate that adding navigational aids to search tools will enhance Web usability and take us a step further towards resolving the problem of "getting lost in hyperspace".</p>	<p>Navigation engine Process Aids performance web search user interface NavZone Compass Google</p>
10	<p>Zhang, Lei. (2014). Linking information through function. <i>Journal of the Association for Information Science and Technology</i>, 65(11), 2293-2305. DOI: 10.1002/asi.23123 King Library permalink: https://sjsu-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=TN_wj10.1002/asi.23123&context=PC&vid=01CAL_SJO&search_scope=EVERYTHING&tab=everything&lang=en_US</p> <p>How information resources can be meaningfully related has been addressed in contexts from bibliographic entries to hyperlinks and, more recently, linked data. The genre structure and relationships among genre structure</p>	<p>Information resource Organizing taxonomy card-sort functional units Computer Information</p>

	<p>constituents shed new light on organizing information by purpose or function. This study examines the relationships among a set of functional units previously constructed in a taxonomy, each of which is a chunk of information embedded in a document and is distinct in terms of its communicative function. Through a card-sort study, relationships among functional units were identified with regard to their occurrence and function. The findings suggest that a group of functional units can be identified, collocated, and navigated by particular relationships. Understanding how functional units are related to each other is significant in linking information pieces in documents to support finding, aggregating, and navigating information in a distributed information environment.</p>	
--	--	--

Worksheet 2: Turn concepts into draft terms, then into your vocabulary list. (Steps 2, 3, 4)

Using your terms in Worksheet 1, group similar/related concepts together in the area below.

<p align="center">Step 2: Group similar/related concepts using the concept terms from Worksheet 1</p>		
<p>*</p> <p>Urban Young Adults Teenagers</p> <p>Everyday life information-seeking Information seeking behavior Psychology</p> <p>User experience Human factors Recognition Communication preferences Browsing Information sources Library perception</p> <p>Librarianship Library Services</p> <p>Representation in Literature</p> <p>Resource Accessibility Interoperability Collection aggregation Classification</p> <p>Collaboration Integration</p> <p>Information Science Meta-Science</p> <p>Metadata Cataloguing Standards Subject vocabulary Index</p> <p>Information System Design Information Retrieval</p> <p>Museums Archives</p> <p>Libraries Digital library Organization Public Libraries Library Spaces</p> <p>Technology Computer Information Mobile based services</p> <p>user interface search engine</p>	<p>Young Adults</p> <p>Everyday life information-seeking Information seeking behavior</p> <p>User experience (or user preferences?) Communication preferences Information sources Library perception</p> <p>Library services</p> <p>Diversity</p> <p>Resource Accessibility Interoperability Classification</p> <p>Collaboration Integration</p> <p>Library and Information Science</p> <p>Metadata Cataloguing standard Vocabulary design Index</p> <p>Information system design information retrieval system</p> <p>Libraries</p> <p>Technology Remote</p> <p>Interface design</p>	<p>Young Adults</p> <p>Information seeking behavior</p> <p>User experience</p> <p>Library services</p> <p>Diversity</p> <p>Collection Management</p> <p>Collaboration</p> <p>Library and Information Science</p> <p>Metadata</p> <p>information retrieval system</p> <p>Libraries</p> <p>Digital media</p> <p>Information system design</p>

<p>search interface navigation engine taxonomy Interface Design</p> <p>Research Theory Case Study</p>	<p>Search engine Information system design</p>	
---	--	--

Worksheet 2, continued—Controlled vocabulary: DRAFT list of descriptor terms.
Step 3: Decide on a best term for each concept, creating the draft of your vocabulary.

List here one term you think you may use to express each concept; it's okay to list more than one as long as only one makes it to the final list below.

archives
collaboration
collection management
digital media
diversity
information retrieval system
information seeking behavior
information system design
libraries
library and Information Science
library services
metadata
museums
user experience
young adults

Worksheet 2, continued—Controlled vocabulary: FINAL list of descriptor terms, in alphabetical order.

Step 4: *Edit the draft list according to the principles covered in the Exercise 2 instructions.
Sort into alphabetical order.*

collaboration
collection management
digital media
diversity
information retrieval system
information seeking behavior
information system design
libraries
library and information science
library services
metadata
user experience
young adults

Worksheet 3: Use your controlled vocabulary to index the records.

Step 5: Assign 3 to 4 subject descriptors from your final vocabulary (above) to each article. As a last step, doublecheck that the descriptors you assign accurately reflect the main concepts. Make adjustments to the vocabulary if needed.

	RECORD	ASSIGNED DESCRIPTORS Assign 3 to 4 subject descriptors to each article.
1	<p>Bates, Marcia. (1999). The invisible substrate of information science. <i>Journal of the American Society for Information Science</i>, 50(12), 1043-1050.</p> <p>The explicit, above-the-water-line paradigm of information science is well known and widely discussed. Every disciplinary paradigm, however, contains elements that are less conscious and explicit in the thinking of its practitioners. Elucidates the key elements of the below-the-water-line portion of the information science paradigm. Highlights the role of information science as a meta-science: conducting research and developing theory around the documentary products of other disciplines and activities. Views the mental activities of the professional practice of the field as centering around representation and organization of information, rather than knowing information. Argues that such representation engages fundamentally different talents and skills from those required in other professions and intellectual disciplines. Also considers methodological approaches and values of information science.</p>	<p>information retrieval system information seeking behavior library and information science metadata</p>
2	<p>Agosto, Denise E. & Hughes-Hassell, Sandra (2005, Spring). People, places, and questions: An investigation of the everyday life information-seeking behaviors of urban young adults. <i>Library & Information Science Research</i>, 27(2), 141-163.</p> <p>This article presents preliminary findings from a research grant on the everyday life information-seeking (ELIS) behaviors of urban young adults. Twenty-seven teens aged 14 through 17 participated in the study. Qualitative data were gathered using written activity logs and semi-structured group interviews. A typology of urban teens' preferred ELIS sources, media types, and query topics is presented. The typology shows friends and family as preferred ELIS sources, cell phones as the preferred method of mediated communication, and schoolwork, time-related queries, and social life as the most common and most significant areas of ELIS. The results indicate a heavy preference for people as information sources and that urban teens hold generally unfavorable views of libraries and librarians. The conclusion lists questions that information practitioners should consider when designing programs and services for urban teens and calls for researchers to consider this often-ignored segment of the population as potential study participants.</p>	<p>digital media diversity user experience young adult</p>

3	<p>Elings, Mary W. & Waibel, Gunter (2007, March 5). Metadata for all: Descriptive standards and metadata sharing across libraries, archives, and museums. <i>First Monday</i>, 12(3). Retrieved from http://www.firstmonday.org/</p> <p>Integrating digital content from libraries, archives and museums represents a persistent challenge. While the history of standards development is rife with examples of cross-community experimentation, in the end, libraries, archives and museums have developed parallel descriptive strategies for cataloguing the materials in their custody. Applying in particular data content standards by material type, and not by community affiliation, could lead to greater data interoperability within the cultural heritage community. In making this argument, the article demystifies metadata by defining and categorizing types of standards, provides a brief historical overview of the rise of descriptive standards in museums, libraries and archives, and considers the current tensions and ambitions in making descriptive practice more economic [1].</p>	<p>collaboration collection management digital media metadata</p>
4	<p>Bates, Marcia J. (1998, November). Indexing and access for digital libraries and the internet: Human, database, and domain factor. <i>Journal of the American Society for Information Science</i>, 49(13), 1185-1205.</p> <p>Presents information on a study which looked at indexing and access to digital libraries and the Internet. Factors important in the design of access mechanisms; Skills of an indexer; Reference to previous literature; Information on folk classification.</p>	<p>digital media information retrieval system information system design libraries</p>
5	<p>Agosto, Denise E., Kuhlmann, L. Meghann, Pacheco Bell, J., & Bernier, Anthony. (May/June 2014). Learning from librarians and teens about YA library spaces. <i>Public Libraries</i>, 53(3), 24-28.</p> <p>The article discusses the results of the empirical study of the physical and spatial aspects of young adult (YA) library services in the U.S. as of May 2014. Topics highlighted include ways for public libraries to improve their library services for YA users, the need for design revisions to adapt to how users are using and interacting with their libraries and analysis of video data gathered during the study. Also mentioned is the importance of access to technology for YA users.</p>	<p>digital media library services user experience young adult</p>
6	<p>Bates, Marcia J. (2007, October). What is browsing—really? A model drawing from behavioural science research. <i>Information Research</i>, 12(4). Retrieved from http://www.informationr.net/ir/12-4/paper330.html</p> <p>Introduction. It is argued that the actual elements of typical browsing episodes have not been well captured by common approaches to the concept to date.</p>	<p>information retrieval system information seeking behavior user experience</p>

	<p>Method. Empirical research results reported by previous researchers are presented and closely analysed.</p> <p>Analysis. Based on the issues raised by the above research review, the components of browsing are closely analysed and developed. Browsing is seen to consist of a series of four steps, iterated indefinitely until the end of a browsing episode: 1) glimpsing a field of vision, 2) selecting or sampling a physical or informational object within the field of vision, 3) examining the object, 4) acquiring the object (conceptually and/or physically) or abandoning it. Not all of these elements need be present in every browsing episode, though multiple glimpses are seen to be the minimum to constitute the act.</p> <p>Results. This concept of browsing is then shown to have persuasive support in the psychological and anthropological literature, where research on visual search, curiosity and exploratory behaviour all find harmony with this perspective.</p> <p>Conclusions. It is argued that this conception of browsing is closer to real human behaviour than other approaches.</p> <p>Implications for better information system design are developed.</p>	
7	<p>De Sabbata, S., Mizzaro, S., & Reichenbacher, T. (2015). Geographic dimension of relevance. <i>Journal of Documentation</i>, 71(4), 650-666. doi: 10.1108/JD-12-2013-0167</p> <p>King Library permalink: https://sjsu-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=TN_emerald_s10.1108/JD-12-2013-0167&context=PC&vid=01CAL_SJO&search_scope=EVERYTHING&tab=everything&lang=en_US</p> <p>Purpose – The purpose of this paper is to discuss the emerging geographic features of current concepts of relevance, and to improve, modify, and extend the framework proposed by Mizzaro (1998). The objective is to define a new framework able to account, more completely and precisely, for the notions of relevance involved in mobile information seeking scenarios.</p> <p>Design/methodology/approach – The authors formalise two new dimensions of relevance. The first dimension emphasises the spatio-temporal nature of the information seeking process. The second dimension allows us to describe how different concepts of relevance rely on different abstractions of reality. Findings – The new framework allows: to conceptualise the point in space and time at which a given notion of relevance refers to; to conceptualise the level of abstraction taken into account by a given notion of relevance; and to include widely adopted facets (e.g. users mobility, preferences, and social context) in the classification of notions of relevance. Originality/value – The conceptual discussion presented in this paper contributes to the future</p>	<p>collection management digital media information seeking behavior library and information science</p>

	<p>development of relevance in the scope of mobile information seeking scenarios. The authors provide a more comprehensive framework for conceptualization, development, and classification of notions of relevance in the field of information retrieval and location-based services.</p>	
8	<p>Tucker, V.M. & Edwards, S.L. (2021). Search evolution for ease and speed: A call to action for what's been lost. <i>Journal of Librarianship and Information Science</i>, 53(4), 668-685. doi.org/10.1177/0961000620980827</p> <p>In recent years, leading website search engines have abandoned vital search features supporting complex information needs, evolving instead for the marketplace and for users seeking speedy answers to easy questions. The consequences are troubling, for researchers and for information science educators, with concerns ranging from the very relevance of search results and the unknowing of what is missing, to the novice searcher's waning ability to frame potent queries and to learn ways to refine results. We report on a grounded theory study of search experiences of information professionals and graduate students (n=20) that contributes a holistic understanding of web searching, using its findings both to frame what is lacking in the design evolution of search engines for complex information needs and to outline a way forward. The study's implications coalesce in a call to action for more inclusive search interface design, and an agenda is put forth for how information researchers, educators, and literacy advocates can move forward in their intersecting domains.</p>	<p>digital media information retrieval system information system design user experience</p>
9	<p>Mat-Hassan, Mazlita & Levene, Mark (2001, September 3). Can navigational assistance improve search experience? A user study. <i>First Monday</i>, 6(9). Retrieved from http://www.firstmonday.org/.</p> <p>Providing navigational aids to assist users in finding information in hypertext systems has been an ongoing research problem for well over a decade. Despite this, the incorporation of navigational aids into Web search tools has been slow. While search engines have become very efficient in producing high quality rankings, support for the navigational process is still far from satisfactory. To deal with this shortcoming of search tools, we have developed a site specific search and navigation engine that incorporates several recommended navigational aids into its novel user interface, based on the concept of a user trail. Herein, we report on a usability study whose aim was to ascertain whether adding semi-automated navigational aids to a search tool improves users' experience when "surfing" the Web. The results we obtained from the study revealed that users of the navigation engine performed better in solving the question set posed than users of a conventional search engine. Moreover, users of the navigation engine provided</p>	<p>digital media information retrieval Information system design user experience</p>

	<p>more accurate answers in less time and with less clicks. Our results indicate that adding navigational aids to search tools will enhance Web usability and take us a step further towards resolving the problem of "getting lost in hyperspace".</p>	
10	<p>Zhang, Lei. (2014). Linking information through function. <i>Journal of the Association for Information Science and Technology</i>, 65(11), 2293-2305. DOI: 10.1002/asi.23123 King Library permalink: https://sjsu-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=TN_wj10.1002/asi.23123&context=PC&vid=01CAL_SJO&search_scope=EVERYTHING&tab=everything&lang=en_US</p> <p>How information resources can be meaningfully related has been addressed in contexts from bibliographic entries to hyperlinks and, more recently, linked data. The genre structure and relationships among genre structure constituents shed new light on organizing information by purpose or function. This study examines the relationships among a set of functional units previously constructed in a taxonomy, each of which is a chunk of information embedded in a document and is distinct in terms of its communicative function. Through a card-sort study, relationships among functional units were identified with regard to their occurrence and function. The findings suggest that a group of functional units can be identified, collocated, and navigated by particular relationships. Understanding how functional units are related to each other is significant in linking information pieces in documents to support finding, aggregating, and navigating information in a distributed information environment.</p>	<p>digital media information retrieval system information system design metadata</p>