UNIT 1   META RESOURCES

Structure

1.0 OBJECTIVES

The objective of this unit is to impart knowledge on meta resources as an organized and structured guide to network-based electronic information resources available on the Internet for a fee or free. After careful study of this Unit you will be able to:

- discuss meta resources and other variable terms such as Web portals, vortals and hortals;
- understand the basic characteristics and essential elements of meta resources;
- distinguish between different types of meta resources and their developers;
- know the methodology, organisation and tools for building-up Meta Resources; and
- describe important Meta Resources on the Internet.

1.1 INTRODUCTION

The biggest barrier to effective use of the information available on the Internet is finding the right resource at the right time, given the fact that the Internet is not an organized body of information. It is, rather, an assembly of unorganized information, and hence it cannot provide the kind of sophisticated indexing and search capabilities that the commercial databases offer. Although there are thousands of search engines, meta search engines, directories and specialty search engines that a user can use for conducting a search on a given topic. the search results conducted using any Internet search engine too many links to unfiltered information resources. A user is confronted with the daunting task of locating relevant information from a great volume of contents consisting of links to information resources of varying quality. The growth of the web has proliferated so rapidly and in so many areas of society that bibliographic control on the resources available on the Internet has become an urgent necessity if it is to mature into a reliable and effective medium of communication.

Because of this rapid growth, librarians and information professionals are developing a variety of solutions for bringing the explosion of web resources under control. The unorganized, unstructured and uncontrolled information contents of the Internet call for an attempt on the part of the librarians and information professionals to provide structured and systematic access to information available on Internet by:

i) Selecting, evaluating and filtering information content of the Internet;

ii) Classifying and cataloguing these resources considering their inherent characteristics; and

iii) Providing an organized and structured guide to the resources selected in the first step through a meta-resource site or through the library's home page.

The role of a library is to provide organized and structured access to its collection for their users. The access infrastructure in a library usually consists of a library catalogue or the Library OPAC. The library selects its printed resources after careful evaluation of the resources to be acquired before they are added to the collection. The resources, added in the process of collection development, are

classified and catalogued so as to ensure that they reach their respective users. The information resources available on the Internet cannot be treated differently from those available in the print media within a library. The Internet and the web are merely new media that provide access to different types of information resources. It is, therefore, imperative for the libraries to apply their expertise in the process of selection, evaluation and filtration of information resources and to provide organized and structured access to them. A meta resource site consisting of information resources that are carefully selected by the librarians and information specialists, serve the users best through their value-added characteristics that provide intuitive access to a selective few, high-quality information resources.

1.2 META RESOURCES: DEFINITION

Meta resources, variably called subject gateways, subject-based information gateways (SBIGs), subject-based gateways, subject index gateways, virtual libraries, clearing houses, subject trees, pathfinders, guide to Internet resources, and a few more variations thereof, are facilities that allow easier access to network-based resources in a defined subject area. For consistency of terminology, this unit would use "meta resources" in preference to other prevailing terminology. Meta resources sites redirect a user to the holders of the original digital material. They may use then own indexing technique and provide search services and may combine original resources from a number of different providers. The meta resources restrict their operation to providing linkages to independent third party sources.

A meta resource can be defined as an organized and structured guide to Internet-based electronic information resources that are carefully selected after a predefined process of evaluation and filtration in a subject area or specialty. Meta resources are often independent websites or part of an institution or library's website that serve as a guide to Internet resources considered appropriate for their target audiences. A meta resource site that is a part of an institutional website or the library's website may include resources that are on subscription by the parent organization or are accessible for free, to all. A meta resource site may also be built by a commercial enterprise that is accessible free of cost upto the bibliographic level. However, a user may be required to pay if he / she wishes to access the full-text. Home pages of all the major educational and research institutions, especially in the developed world, provide an organized and structured guide to electronic resources available on the Internet.

Portals, vortals and hortals are other concepts evolved primarily from the concept of meta resources. A **portal** is a website that offers a broad array of resources and services and is intended to be the main point of entry to the Internet for the users. Besides, hosting a catalogue of websites, a portal site may offer other enticements to the users such as e-mail, forums, search engines, calendars and on-line shopping malls so as retain keep users at the site and to draw repeat visitors. The first web portals were online services, such as America Online Ltd. (AOL), that provided access to the web as an Internet Service Provider (ISP). Most of the traditional search engines have transformed themselves into web portals to attract and keep a larger audience. The portals are also characterized by their ability to personalize the site for users according to their own preferences.

A **vortal** is vertical industry portal that provides information and resources for a particular industry. Vortals typically provide relevant industry information like news, research and statistics, discussions, newsletters, online tools. and many other services that educate users about a specific industry. Vortals are the Internet's way of catering to consumers' focused-environment preferences. As the web becomes a standard tool for business, vortals will join and may replace general portal sites, like AOL and Yahoo!, as common gateways to the Internet. **Hortal** or horizontal portals are interest group or community-specific portals that provide a business-to-consumer e-commerce web site which allows large numbers of community-based consumers to transact electronically with a limited number of suppliers. These suppliers generally supply goods specific to the interest or community group.

1.2.1 Basic Characteristics of Meta Resources

A meta resource serves as a discovery tool, enabling users to quickly locate the most relevant Internet resources. It directs its users towards contents that are freely available although difficult to find using a non-specific search engine. A meta resource site is inherently reliable because the resources included in it are selected on the basis of predefined selection criteria, catalogued by following consistent practices and are analysed by people with expertise in the relevant subject discipline. Links on a meta resource site are checked frequently in an automated process and entries are updated regularly by subject specialists. A meta resource offers a community of users a single entry point to resources for a given topic or sets of topics. Basic characteristics of a meta-resource site are as follows:

i) A meta resource site should be available in electronic format and accessible via the Internet;

ii) It should provide links to all categories of Internet information resources and services, e.g. Web, Gopher, FTP sites, Usenet User Groups, Electronic Mailing Lists, etc. dealing with one or more than one specific topic(s);

iii) It should provide transparent access to a wide range of high-quality information and information services that have been assessed to be of high relevance in a given subject specialty;

iv) A meta resource site should be a compilation of Internet resources or finding-aid for students, researchers, teachers and other Internet users interested in locating authoritative information on the Internet. .It should not be a promotional site for a commercial venture;

v) The primary goal of a meta resource site should be to help users to access Internet resources on a given topic from various Internet sites besides the meta resource site itself; and

vi) It should be partially or fully free-of-charge for end-users.

1.2.2 Meta Information about the Internet Information Resources

A meta resource consists of information resources on a given topic(s) that are organized to facilitate selective access to qualitative and authoritative information. A meta resource consisting only of links to the information

resources defeats the purpose of its existence. The context in which an information resource is included is extremely important. Just like a bibliographic record in a catalogue contains a few essential elements that describe the book (author, title, publisher, etc.), each information resource included in a meta resource should contain at least a few elements to adequately describe it. The elements used for describing an Internet information resource are as follows:

i)   Title / Name of the Resource

ii) URL of Resource

iii) Source / Author / Creator

iv) Authority of Source

v)   Publisher

vi) Last Update / Update Frequency

vii) Expiration Date (if applicable)

viii) Size / Volume: Specially for software, sound, image and movie files

ix) Intended Audience: If the resource is appropriate for students, faculty, staff, children or any other audience.

x)   Subject and Keywords

xi) Description: describe the scope, aims, and goals of the resource.

1.3 TYPES OF META RESOURCES

The meta resources or portals are an increasingly common sight on the web. For users who are connected to the Internet via a service provider such as MSN and AOL in USA or Mantra Online or Sigma Online in India, their service provider's portal is likely to be the first thing to greet them on the web, and there is a real effort on the part of the service provider to make their portals sufficiently attractive for the user to use the services and content provided in or through the portal, or provided by one of their partners. Besides commercial portals mentioned above, the concept of portals or meta resources have found their applications in different fields and at various levels. Meta resources may be categorized under the following three categories:

● Commercially-financed portals, available freely, with an aim to hook a user to the site by providing access to a range of useful proprietary services (e-mail, etc.) and some prescribed content (news feeds, reference material, etc.). Examples of commercially financed portals are Microsoft Network (MSN), Yahoo!, Excite, Netscape, Lycos, CNET, and America Online's AOL.com. Subject-specific meta-resources may be backed-up by commercial publishers (Elsevier's BioMedNet), and scholarly societies (CAS's ChemWeb).

● Institutional portals, principally focused upon providing access to local functions and services, but capable of pointing to external content. Institutional portals seek to fulfil a range of functions, providing news feeds of interest to the institution and linking to management systems in order to track fees, payments, etc., and integrating to a degree with back-end databases handling time-tabling, room bookings and the like in order to remind students where they need to be and when. Several libraries have established one or more meta resources to provide access to electronic resources via the Internet through the

library's website. Several meta resources are format-specific and provide access to free or fee-based resources of different intellectual formats including e-encyclopedia, e-dictionaries, e-books, e-journals, software, online electronic databases, sounds, images, etc.

● **Virtual Learning Environments** (VLEs) and **Managed Learning Environments** (MLEs), refer to the components in which learners and tutors participate in "on-line" interactions of various kinds, including on-line learning. Virtual Learning Environments are increasingly becoming an important part of the educational system for delivering online and flexible learning. The IGNOU programmes on BIT, ADIT are examples of this category.

A meta resource site may be **subject-specific** or **format-specific.** Several subject-specific or format-specific meta resources that are available on the web offer a single entry point to resources in a given topic or set of topics. A meta resource may be "Umbrella" type, i.e. consisting of single collection that provides access to all kinds of information resources or it can be segmented, customized or re-purposed to serve different patrons differently, each of which may vary in focus and / or presentation. The meta data that describes the individual collections in the meta resources may be stored locally or remotely, it may be published by a third party or be custom-generated by the Library.

1.4 METHODOLOGY FOR BUILDING UP META RESOURCES

The process of building-up a meta-resource site requires distinct involvement of a subject expert and an information specialist. It is desirable that a subject expert describes the information resources for a meta resource site to reflect it most aptly in representation systems such as contents and indexes. However, it would require the services of an information professional to organize the resources since it is an information specialist who is well-versed with the intricacies involved in the design and development of information retrieval systems, be it for achieving standardization through vocabulary control or for deciding the coordination of terms in the subject headings which support searches, etc.

A meta resource should have a well-defined policy for selection, evaluation and description of information resources available through it. It should have a consistent collection development policy. The information resources should meet the user's needs and fit the mission of the meta resource developer. The information resource should be authoritative and should cover the desired depth and breath of the subject area. The steps involved in the process of building-up a meta resource include:

1.4.1 Study of Subject(s)

The information professional involved in the process of building-up a meta-resource, needs to have functional knowledge of the subject, its structure, terms and available resources in the area. A systematic way to get a functional knowledge of a subject is to conduct a study of the subject. The steps involved in it include taking stock of the historical background of the given subject and terminological development. The structure of the subject can be determined by the way the subject has been treated in different classification systems. It alsr

involves study of available sources on the subject and their classification. This is essential in organizing the reference material, articles and other sources in a useful order. At the end of the exercise, an information specialist will have essential insight and enough knowledge of a subject to be able to proceed with organization of information resources. The methodology of study of Universe of subjects included in the LIS courses will give a useful clue on this aspect.

1.4.2 Identification, Selection and Evaluation of Information Resources

Identification of Information Resources

Identification of information resources is the first step in developing a meta resource. Search engines, mailing lists, Usenet User Groups, directories and other meta resources sites may be used for identifying information resources that may be consitiered for selection for a meta resource. Newspapers, magazines and scholarly journals may also be used for identification of information resources for a meta resource site. Free e-mail subscription to Newsletters like *Virtual Acquisition Shelf* and *News Desk* (http://www.resourceshelf.blogspot.com/), *What's New on Academic Info* (http://www.academicinfo.net/new.html), *LII New This Week* (http://www.lii.org/search/ntw) can also be availed to get links to new resources

Selection

Selective information resources are much easier to maintain, and provide more value to users than those that are less discriminating. The selection of an information resource for a meta resource site would be based on the process of evaluation described in the next step.

Evaluation

Internet resources differ from print-based resources largely in their presentation and way they can be accessed. However, the criteria employed for evaluation of information resources are not different from those used for printed-resources. Unit 3 of this block elaborates on evaluation of Internet information resources.

1.5 ORGANIZATION OF META RESOURCES

Information resources need to be presented in an organized and structured fashion so as to add value to the resources included in the meta resource. Even the most basic set of meta-resources have an organization system (alphabetical), a navigation system (imbedded on the meta site or using browser's features such as "Back" and "Forward"), and a labelling system comprising name of resources and names of meta sites. In addition, a meta-resource site should also have a feedback mechanism to ensure that it responds to the user's needs. Providing an organizational structure to a meta resource involves the following:

1.5.1 Using Classification / Controlled Vocabulary

The purpose of designing a meta resource is to retrieve precise information of high relevance. The general-purpose automated Internet search engines fail to achieve this goal in the process of searching a vast number of heterogeneous documents by mechanically matching words in the http documents. Further, the Internet search engines do not have any semantic context to the terms

matched. The meta resources stand apart as a dataset of organized and structured information resources where the general-purpose Internet search engines fail. The traditional tools of organization such as library classification system are very useful for subject-guided searches. The classification number allows a subject tree to be automatically created allowing the resources to be efficiently browsed. Standard classification schemes; such as the Universal Decimal Classification scheme can be used to impose a structure on a meta resource. The use of familiar classification schemes allows users to quickly find exactly the resources that will interest them. The publisher of a meta resource can determine which classification scheme to use for providing an organizational structure to the resources.

Most meta resources have developed their own subject scheme while others use existing subject headings, thesauri or a controlled vocabulary. The access to information resources on a meta resource site can also be provided using subject headings only. Access points for an information resource may also include author, title and format (e-directory, e-journal, e-book, software, e-encyclopedia, etc.). Access may also be provided for a particular audience such as children, faculty, staff, people with disabilities, etc. A meta resource site may provide a number of simultaneous organizational schemes offering the users the chain to define their own options through a pull-down selection menu and clickable selection boxes.

1.5.2 Back-end Database Support for a Meta Resource

A professionally designed meta resource site would require that metadata about information resources in it are maintained in a database with pre-defined data structure. A meta resource site with a 'back-end database provides a strong organizational benefit to the site. The web-enabled database would allow a user to conduct searches on the information resources available on the site and generate its portions on-the-fly. In addition to a user interface, the back-end database for a meta resource site may also have a administrative interface, available via the web, which would enable the staff to add, modify, delete records and assign keywords using a controlled vocabulary. A formal database ensures consistency among records and makes it easier to maintain the collection over time. The database-driven meta resource allows to re-purpose and re-organize the information resources contained in it easily, allowing the meta resource administrator to publish versions of the same data in different ways or on different sites or publish versions on non-web formats. The software for a meta resource site would consist of the following components, i.e.:

The Database Containing Meta Data on Information Resources

The database containing meta data about Internet information resources can be designed using any standard database management system like Microsoft Access, Oracle, MySQL or MS SQL Server, PostgreSQL, etc. This database would contain details on Internet information resources along with its description and a link to the resources.

Web Interface to the Database

The ODBC (Open Database Connectivity) drivers for most of the important databases are in-built into the operating system. However, Common Gateway Script (CGI) programming, often written in PERL, are used to write such interfaces, in case the ODBC is not available. Moreover, scripting languages

are used to develop complex web applications even if ODBC is available for a database. However, common tasks can be accomplished using Active Server Pages (ASP) Technology and the VBScript. ASP technology requires Windows NT's Internet Information Server. Unix and complaint web servers can use ASP with add-on available from Chili!Soft or other vendors. Java applications called Java applets that run on a client machine and servlets that run on a server, are also used for developing web interface to a database.

Browsing and Search Software

ASP technology using VBScript may be used to provide a user-friendly browsing and search interface. On conducting a search, the interface would query the database and derive the data from the back-end database containing the meta data on Internet information resources and present it to the user on-the-fly.

Site Administration and Maintenance

Web-based interfaces need to be developed to facilitate site administration, maintenance and updation of database and the meta resource. A web-based interface would also be required for data entry of surrogate records from multiple locations. Administrative interfaces are also required to generate administrative reports and statistics in various formats.

1.5.3 Navigation System

A meta resource site, as for any other website, would require a navigation system that ensures that users can move efficiently between and amongst the major areas and hierarchical levels of the sites. A meta resource site should have a local navigation system that provides access to its other parts.

1.5.4 Labeling System

Labels are terms that describe an entity on a meta resource. A labeling system cominunicates information without taking up too much of vertical space or a user's cognitive space. In a meta resource site, the labeling system reflects the organization and navigation systems of the collection and describes the information resources themselves. A label should precisely define the entity in the fewest words possible and as clearly as possible. Labels should use language appropriate for the collection's audience. Standard subject headings like Library of Congress Subject Headings (LCSH), Medical Subject Headings (MESH), Subject Headings in Engineering (SHE) may be considered for meta resources intended for scholars, scientists and technologists, while it would be better to use normal speech for children, students and lay persons.

1.5.5 Feedback

To keep the meta resource site useful and relevant to the user, it is important that the developer of a meta resource analyses its usage and incorporates feedback from the users. The meta resource developer should deploy tools and techniques to learn how a user enters the collection and pages and resources that are used most or least. The meta resource should allow users to provide feedback about the services and report errors such as broken links. A form for users to suggest new resources may also be incorporated.

1.6 TOOLS FOR BUILDING UP A META RESOURCE

There are a couple of off-the-shelf software packages available for developing meta resources. These include:

Knowledge Cite Library (Silver Platter)	**http://www.knowledgecite.com/**
Database Adviser	http://scilib.uscd.edu/proj/dba/
Pharos	http://uias.calstate.edul
Northern Light	http://northernlight.com/
ROADS	http://www.roads.lut.ac.uk/

Two tools that may be used to set up subject-based meta resource are discussed in the section below. While ROADS provides a directory structure to a meta resource allowing comprehensive coverage of resources on a given topic, Ht/ Dig follows a robot-based search approach by subject terms to look for information and update the databases that form the basis of retrieval systems in a semi-automated environment.

1.6.1 ROADS (Resource Organization and Discovery in Subject-based Services)

ROADS is a set of software tools and standards designed to set up and maintain meta resources for all kinds of Internet resources, including WWW sites, Telnet-based services, FTP sites, mailing lists, etc. It is a project of the Centre for Computing in the Social Sciences, University of Bristol. ROADS-based meta resources are developed on a database that contains information about information resources. The ROADS software is written in Perl. It runs on any modem version of the Unix operating system, such as Linux. ROADS is designed to overcome the problems of general Internet search engines as it allows design of meta resources that include resources that are fully described or abstracted, and classified according to a recognized classification scheme, allowing resources to be located much more efficiently. Contrary to the automated search conducted by general search robots, ROADS-based meta resources are maintained by human subject experts thus ensuring more precision in retrieval.

Steps in Creation of the Meta Resources using ROADS

The three basic steps involved in creating meta resources using ROADS are as follows:

i) Creation and maintenance of records in a database of resource descriptions;

ii) Automatic generation of web pages on-the-fly using the information in the database records; and

iii) Indexing, search and retrieval engine that allows the database to be interrogated using simple keyword, or more complex Boolean searches.

Creation and Maintenance of the Database

ROADS offers tools that help in the creation of records and facilitates maintenance and editing of records. Records can be entered manually through any text-editing program, but it is recommended that the tools that ROADS provides be used for creation and maintenance of the database. These tools are made available as web forms that can be filled-in through Internet browsers.

The tools also help by automatically filling-in certain attributes, such as the record Handle (the unique identifier for the record), and the date and time the record was created. The first record creation screen allows selection whether it is creating a new record, or editing an existing one. It guides selection of the type of record that is to be created. The record creation process allows for a number of options. The record text can be returned to the screen (useful for checking the record before submitting it to the database), e-mailed to the database administrator. or entered into the database. Options are provided to ::elect whether the resource should be added to the "Subject Listings" and the "What's New" listing at this stage.

Once a record is created, it must be edited to keep it up-to-date. To edit a record, the edit option may be selected from the main template creation screen, and the handle of the record that has to be edited is required to be furnished. As the handles are rather long, this can often be difficult. Fortunately, ROADS provides another means of locating records for editing. A search is entered in the same way as normal search. The search results have a button after each resource that will display the record creation form with the fields already filled-in. ready to be edited.

Subject Headings

hi order to allow users of a ROADS-based meta resource to browse the database of resource descriptions, ROADS provides tools to create a set of subject listings consisting of a top-level listing of all the subject headings followed by listing of all the resources that come under a particular subject heading. The resource listing can contain links to both the resource itself and the corresponding resource description. A resource can be inserted in the appropriate subject listing when the record is created by checking an option provided for the purpose at the bottom of the form.

Processing of Records

ROADS incorporates tools that automatically process the database records to create HTML pages that allow the user of an information gateway to browse the resource descriptions efficiently, allowing the user to quickly find the resources that interest them. This includes creating a subject menu according to the selected classification scheme.

Search Facilities

As soon as a record is entered into the database, it is automatically indexed. This allows for very quick and efficient searching of the database. An easy to use web search form is provided to allow the data-base to be interrogated by the users.

Advantages of Using ROADS

The advantages of using ROADS can be summarized as follows:

i) ROADS has the provision of meta resources with the subject specialists on whose knowledge they are based. This is essential with a subject-based service that filters out useless resources;

ii) ROADS is based on the use of web forms. It includes a range of tools to automate publishing of a meta resource;

iii) ROADS allows users of a meta resource a transparent means of locating and accessing Internet resources: and

iv) ROADS is based on a range of standards that allow information about resources to be easily exchanged and stored. It is intended to enable multi-disciplinary searches to be carried out across multiple ROADS-based meta resources.

1.6.2 ht://Dig

Ht/Dig is one useful tool for setting up a configured search engine. The ht:// Dig system is a complete worldwide web indexing and searching system for a domain and is a freeware available under GPSL. ht://Dig was developed at San Diego State University as a way to search various web servers on the campus network. Ht/Dig compiles a database of all the documents that may be specified and included for the search and then performs the search. It has many features that help customize the search domain and also to get output in desired formats. It performs the tasks in the following three steps:

Digging

Digging is the first step in creating a search database using ht/Dig software. This system uses the word digging, while other systems call it harvesting or gathering. In the ht://Dig system, the program 'htdig' performs the information gathering stage. In this process, the program acts as a regular web user, except that it follows all hyperlinks that it comes across. The digging process will create at least two files. The first one consists of a list of all the words and the second one is a database of URLs and information about the URLs.

Merging

Once the digging process is complete, the data is converted into a format, which the search engine can read. The 'htmerge' program does this. The term "merge" is used because data from several databases is gathered together and merged into several other databases. The source databases include the databases created by not only the latest "dig" but also any previously merged databases. The latest dig will produce a database that provides information on new pages and information on changes to previously existing pages; the information on the new pages, and the new information on changes to old pages are merged with the unchanged information to create up-to-date databases.

Searching

All the information gathered and organized during the dig and merge stages is used in searching. The 'htsearch' program performs the actual searches. The CGI (Common Gateway Interface) program, using the HTML "search form" as input performs the search and produces the HTML output which users see.

Using Ht/Dig, both HTML documents and plain text files can be searched. Searches can be complex using Boolean expressions. Searches can be performed using various configurable algorithms like having exact searches, common word endings, synonyms, etc. Any number of keywords can be added to HTML documents that will not show up when the document is viewed. This is used to make a document more likely to be found and also to make it appear higher in the list of matches. Another important feature is that the output of search can be customized. It would be interesting to output the search results in the Dublin Core-like format if all information required is available in the retrieved resources.

1.7 IMPORTANT META RESOURCES

There are several thousand general-purpose and subject-specific meta resources and portal sites available on the Internet. Any attempt to compile a comprehensive guide to the meta resources would be a futile exercise. Only a few important meta resources are listed here.

1.7.1 LibrarySpot.com (http://www.libraryspot.com)

LibrarySpot is a free virtual library resource centre for educators and students, librarians and their patrons, families, businesses and just about anyone exploring the web for valuable research information. LibrarySpot.com aims at breaking through the information overload, of the web and brings the best library and reference sites together. Sites featured on LibrarySpot.com are hand-selected end reviewed by an editorial team for their exceptional quality, content and utility. Published by StartSpot Mediaworks, Inc. in the Northwestern University 1 Evanston Research Park, LibrarySpot is the first in a family of vertical information portals designed to make finding the best topical information on the Internet a quick, easy and enjoyable experience. The LibrarySpot.com has received more than 30 awards and honours. Most recently, Forbes.com selected I,ibrarySpot.com as a "Forbes Favourite" site, the best in the reference category, and PC Magazine named it one of the Top 100 Websites. LibrarySpot.com has been featured on CNN, Good Morning America, CNBC and in many other rnedia outlets.

1.7.2 Librarians' Index to the Internet (LII) (http://lii.org/)

The Librarians' Index to the Internet (LII) consists of more than 8,600 Internet resources selected and evaluated by librarians for their usefulness to users of public libraries. Free e-mail subscription to the LII New This Week (http:l/www.lii.org/search/ntw) incorporates the most recent resources added to the LII. It has close to 12,000 subscribers in 85 countries. LII' also offers co-branding service to the libraries that are members of the Library of California. The site provides both browsing and searching interfaces.

11.7.3 Argus Clearing House (http://www.clearinPhouse.net/)

The Argus Clearing House is a guide to the meta resources. It provides a central access point for value-added topical guides that identify, describe, and evaluate Internet-based information resources. The Argus Clearinghouse is a non-profit venture run by a small group of dedicated individuals. The Argus Clearinghouse is intended to be a resource that brings together finding aids for students, researchers, educators, and others interested in locating authoritative information on the Internet.

1.7.4 Galaxy (http:Npalaxy.einet.net/)

Galaxy, originally a prototype associated with the DARPA-funded Manufacturing Automation and Design Engineering (MADE) program, is the oldest browsable searchable web directory. It is a searchable Internet directory with a mission to provide contextually relevant information by integrating state-of-the-art technology with the human touch. Galaxy employs the best of technology and human expertise to organize information in a way that makes it both understandable and highly relevant to users' needs. The information

contents of the meta resource is compiled and organized by human Internet Librarians rather than by computer. The Galaxy hierarchy is built utilizing a vertical structure, i.e. the information on particular topics is very deep in content. While other search technologies may yield millions of pages per search (mostly extraneous), Galaxy provides concentrated, relevant results.

1.7.5 Direct Search (http://gwis2.circ.gwu.edu/~gprice/direct.htm)

Direct Search is a growing compilation of links to the Internet resources that contain data not easily or entirely searchable / accessible from general search tools like Alta Vista, Google, or Hotbot. Direct Search has its own search interface.

1.7.6 Vlib: The Virtual Library (http://www.vlib.org;/)

The Virtual Library is the oldest catalogue of the web, started by Tim Berners-Lee, the creator of html and the web itself. Unlike commercial catalogues, it is run by a loose confederation of volunteers, who compile pages of key links for particular areas in which they are experts; even though it is not the biggest index of the web. The Virtual Library pages are widely recognized as being amongst the highest-quality guides to particular sections of the web. Individual indexes live on hundreds of different servers around the world. A set of catalogue pages linking these pages is maintained at http://vlib.org. Mirrors of the catalogue are kept at East Anglia (UK), Geneva (Switzerland) and Argentina. Each maintainer is responsible for the content of their own pages, as long as they follow certain guidelines. The central affairs of the VL are now coordinated by a newly-elected Council.

1.7.7 Academic Info (http://www.academicinfo.com/)

Academic Info, online since 1998, began as an independent Internet subject directory owned by Michael Madin and maintained with the assistance of a qual'ity group of subject specialists. In the spring of 2000 Michael left the University of Washington Gallagher Law Library to focus solely on Academic Info. In 2002 Academic Info became a registered non-profit organization of the State of Washington. Academic Info is now ad-free and relies on donations to remain online. Academic Info aims to be the premier educational gateway to online high school, college and research level Internet resources. The primary focus of the site is academic, with its intended audience at the upper high school level or above. As a priority it adds digital collections from libraries, museums, and academic organizations and sites offering unique online content. The current focus is on English language resources but sites in other languages will be selectively considered.

1.7.8 BUBL (http:llbubl.ac.uk/)

BUBL LINK is the catalogue of selected Internet resources covering all academic subject areas and catalogued according to DDC (Dewey Decimal Classification). All items are selected, evaluated, catalogued and described. Links are checked and fixed each month. LINK stands for Libraries of Networked Knowledge. BUBL 5:15 provides an alternative interface to this catalogue, based on subject terms rather than DDC. The aim is to guarantee at least 5 relevant resources for every subject included, and a maximum of 15

resources for most subjects, hence the name 5:15. Big subject areas are broken down into smaller categories. However, the upper limit of 15 is not rigidly applied, so there may be up to 35 items for some subjects. The subject terms used in BUBL LINK / 5:15 were originally based on LCSH (Library of Congress Subject Headings) but have been heavily customized and expanded to suit the content of the service. The aim is to make it very easy to locate Internet information about all academic subject areas. The BUBL LINK catalogue currently holds over 11,000 resources. This is far smaller than the databases held by major search engines, but it can provide a more effective route to information for many subjects, across all disciplines.

1.7.9 BIOME (http://biome.ac.uk/)

BIOME is a collection of gateways, which provide access to evaluated, quality Internet resources in the health and life sciences, aimed at students, researchers, academics and practitioners. A core team of information specialists and subject experts based at the University of Nottingham Greenfield Medical Library creates BIOME. The Internet resources are selected for their quality and relevance to a particular target audience. They are then reviewed and resource descriptions created, which are stored, generally with the associated metadata, and generally in a structured database. The consequence of this effort is to improve the recall and especially the precision, of Internet searches for a particular group of users. BIOME is a hub within the Resource Discovery Network (RDN) (http://www.rdn.ac.uk), and is funded by the Joint Information Systems Committee (JISC) (http://www.jisc.ac.uk/). There are five dedicated subject services (gateways) within BIOME, each covering a specific area within the health and life sciences. These gateways are AgriFor, VetGate, OMNI, Natural Selection and Bio Research.

1.7.10 The Scout Report (http://scout.cs.wisc.edu/report/sr/current/)

The Scout Report is the flagship publication of the Internet Scout Project. Published every Friday both on the web and by e-mail, it provides a fast, convenient way to stay informed of valuable resources on the Internet. A team of professional librarians and subject matter experts select, research, and annotate each resource. Published continuously since 1994, the Scout Report is one of the Internet's oldest and most respected publications. The Internet Scout Project is located in the Department of Computer Sciences at the University of Wisconsin-Madison, and is funded by a grant from the National Science Foundation.

1.7.11 LivingInternet.com (http://www.livinginternet.com/)

The mission of this website is to make comprehensive, in-depth information about the Internet available around the world. The site was developed from 1996 through 1999, posted on January 7, 2000, and is updated weekly. The site is equivalent to a book of more than 600 pages, with more than 2,000 intra-site links and 2,000 external links woven into the text, making it the first Internet publication of a reference work fully integrated with the web on this scale. Google ranks the site number one in the Internet courses category, and Yahoo lists it as one of the top three sites on Internet history.

1.7.12 Edinburgh Engineering Virtual Library (EEVL) (http www.eevl.ac.uk)

Edinburgh Engineering Virtual Library (EEVL) is an award-winning free service, which provides quick and reliable access to the best engineering, mathematics, and computing information available on the Internet. It is created and run by a team of information specialists from a number of universities and institutions in the UK for students, staff and researchers in higher and further education, as well as anyone else working, studying or looking for information in Engineering, Mathematics and Computing. EEVL provides a central access point to networked engineering, mathematics and computing information. Resources being added to the catalogues are selected, catalogued, classified and subject-indexed by experts to ensure that only current, high-quality and useful resources are included. They include e-journals, databases, training materials, professional societies, university and college departments, research projects, bibliographic databases, software, information services and recruitment agencies.

EEVL, in addition to Internet Resource Catalogues, provides targeted engineering search engines to UK engineering sites, to engineering e-journals and to engineering newsgroups, and to specialized information services, such as the Recent Advances in Manufacturing (RAM) bibliographic database, and the Offshore Engineering Information Service. MathGate at EEVL is involved in the Secondary Homepages Project for UK Mathematics Departments. EEVL's scope is limited to the three subjects, and is therefore more focused than the big search engines. Searching EEVL will retrieve high quality resources, but because EEVL's resources are handpicked, the numbers of sources covered in it are not comparable to the Internet search engines.

1.7.13 Social Science Information Gateway (SOSIG) (http:// sosip.ac.uk/)

The Social Science Information Gateway (SOSIG) is a freely available Internet service which aims to provide a trusted source of selected, high quality Internet information for students, academics, researchers and practitioners in the social sciences, business and law. It is part of the UK Resource Discovery Network. The SOSIG Internet Catalogue is an online database of high quality Internet resources. It offers users the chance to read descriptions of resources available over the Internet and to access those resources directly. The Catalogue points to more than 21,000 resources, and each one has been selected and described by a librarian or academician. The catalogue is browsable or searchable by subject area. Social Science Search Engine is a database of over 50,000 Social Science Web pages. Whereas subject experts have selected the resources found in the SOSIG Internet Catalogue, those in the Social Science Search Engine have been collected by software called a "harvester" (similar mechanisms may be referred to as "robots" or "Web crawlers"). All the pages collected stem from the main Internet catalogue which provides the equivalent of a social science search engine.

1.7.14 Digital Librarian (http://www.digital-librarian.com/)

Maintained by Margaret Vail Anderson, a librarian in Cortland, New York. Internet information resources are catalogued according to subject categories and format-types. Digital Librarian does not have a search interface for the

resources catalogued on the site. It has a browsing interface that gives hand-checked links and see also references to related resources.

1.7.15 QUEST.net (http://www.re-quest.net/)

QLTEST.net is a free online library offering substantive, fully annotated, links to valuable resources in both a unique frame version and a non-framed version. This website to helps students and professionals to locate day-to-day and much needed information and resources in a relatively quick and concise manner. It serves as a one-stop resource directory, providing the Internet community with thousands upon thousands of links, which its committee of web surfers has found to be the most useful, informative and productive. The meta resource provides a fully annotated description of each link together with its URL allowing visitors to know what to expect from the website. Each link has been specially hand picked to provide with the best and most relevant links in each category. This website is useful in an extraordinary way with it's devoted committee of web surfers who work diligently, day-after-day, sorting through the vast galaxies of cyberspace to bring the best and most current resources available.

1.7.16 Internet Public Library (http://www.ipl.orp/)

The Internet Public Library is a product of the University of Michigan's School of Information and Library Studies. It includes extensive directories of online texts, newspapers, magazines and reference materials, plus an exhibit hall and subject sections including Reference Center, Reading Room, Search Tools, Youth References, and Special Collecting. It gives links to more than 20,000 books besides, magazines and online newspapers. It also features links critical and biographical sites dedicated to authors and their works, and an online history of the Harlem Renaissance in New York between 1900 and 1940.

1.7.17 BioMedNet (http://www.bmn.com/)

BioMedNet is owned by Elsevier Science and is part of the Reed Elsevier group of companies. BioMedNet is the website for biological medical researchers. To date there are over 800,000 members of BioMedNet with more than 20,000 people joining per month. Membership to BioMedNet is free and members can search all of BioMedNet without charge. However, viewing full-text articles from publishers often requires payment or a subscription. The site has links to more than 3500 reviewed information resources. The resource provides online access to more than 15,000 review articles. *HMS Beagle: The BioMedNet Magazine* is issued every fortnight. The magazine can be subscribed to by e-mail or can be accessed online.

Self Check Exercise

1) What are the basic characteristics of a meta-resources site?
2) Describe steps involved in building up a meta resource site.
3) Describe the different systems used in organisation of meta resources.

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1.8   SUMMARY

This unit defines meta resources and other variable terms used to denote the concept of meta resource. Web portals, vortals and hortals, concepts evolved from meta resources are also defined with subtle differences amongst the terminology. The unit elaborates upon basic characteristics that distinguish a meta resource site from other information sources. Bare links to Internet information resources do not constitute a meta resource in the true sense. Besides links to information resources, a meta resource site should also contain details about the resources included in it. The unit also elaborates upon essential elements that should describe an information resource included on a meta resource site. The unit describes the types of meta resources and their developers. NP Development of a meta resource site requires three kinds of skills, i.e. i) subject expertise to identify, evaluate and select information resources for a meta resource; ii) information skills of an information specialist to provide organizational structure to the Internet information resources; and iii) skills of a programmer and a web master to build and maintain a back-end database, web interface to the database consisting of browsing and searching interface as well as tools for site administration and maintenance. The unit enunciates navigation and labeling systems that are used for a meta resource site. Feedback mechanism that helps a meta resource site to respond to the user's requirement is also described. The unit describes ROADS and htdig, two important software tools. amongst tools used for developing a meta resource site. The unit elaborates upon steps involved in creating a meta resource site using these two software tools.

1.9   ANSWERS TO SELF CHECK EXERCISES

1)   The basic characteristics of Meta Resources site are as follows: It

   a)   Should be available in electronic format via Internet.

   b)   Should be linked to all categories of information resources and services.

   c)   Should provide tramparent access.

   d)   Shold enable to locate authoritative information.

   e)   Should be partially or fully free-of-charge for end users.

2)   The steps involved in building as a meta resource include:

   a)   Study of subject(s)

   b)   Identification, Selection and Evaluation of information resources.

3)   Meta resources need to be organized and structured so as to add value to the resources. Providing an organizational structure to a meta resource involves (a) classification and/controlled vocabulary (b) Back-end Database Support for a Meta Resource. (c) Navigation System (d) Labelling System (e) Feedback.

1.10 KEY WORDS

Cyberspace   :   A place where people can communicate with each other via e-mail, do research etc. Cyberspace contains objects, live files, mail images, graphics etc.

Domain	:	**A** group on a network that serves as an entrance to another network.
Gateway	:	**A** note on a network that serves as an entrance to another work.
Meta Resource	:	Known as meta data that describes other data (data about data).
Search Engine	:	**A** programme that searches documents for specified keywords and returns a list of the documents where the key words were found.

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