Volume 1, Issue 6 November 2015 ISSN NO: 2454 - 2326

North Asian International Research Journal Consortium

North Asian International Research Journal

Of

Multidisciplinary

NAIRJC JOURNAL PUBLICATION

North Asian International Research Journal Consortium

Welcome to NAIRJC

ISSN NO: 2454 - 2326

North Asian International Research Journal is a multidisciplinary research journal, published monthly in English, Hindi, Urdu all research papers submitted to the journal will be double-blind peer reviewed referred by members of the editorial board. Readers will include investigator in Universities, Research Institutes Government and Industry with research interest in the general subjects

Editorial Board

Address: - Ashak Hussain Malik House No. 221 Gangoo, Pulwama, Jammu and Kashmir, India - 192301, Cell: 09086405302, 09906662570, Ph. No: 01933-212815,
Email: nairjc5@gmail.com, info@nairjc.com **Website:** www.nairjc.com

INFORMATION STORAGE AND RETRIEVAL FOR GLOBAL ACCESS

***RENU BALA, LIBRARIAN**
Tilak Raj Chadha institute of management and technology, Yamuna Nagar, Haryana

****ANJU NAGPAL, LIBRARIAN**
Mukand Lal National Collage, Yamuna Nagar, Haryana

*****GEETA RANI, ASSISTANT LIBRARIAN**
D.A.V Collage for Girls, Yamuna Nagar, Haryana

ABSTRACT

Information Storage and Retrieval (ISAR) System deals with three basic aspects

- Information representation
- Information storage and organisation
- Information access

One of the best examples of ISAR system is library system, where information is stored, processed organised and retrieved on demand, Information could be stored in a book, audio-video, images and so on. The library and information centers endeavor to organize knowledge available in documentary form. The multi-faceted universe of knowledge is represented in libraries in linear form using some classification scheme. At the time of retrieval, specific aids like cataloguing and indexing are used and meaningful information is retrieved.

A lot of emphasis is given on improving the performance of the system. For that librarians have developed classification schemes for helpful arrangement of documents on the shelf so that retrieval can be facilitated. The tools like library catalogue or indexes are developed and modified to satisfy the different approaches of users toward information. Automated systems reduce the effective time of users.

INTRODUCTION

The ISAR system is designed to meet varieties of needs of different classes of users. Nowadays ISAR system is designed on modular basis, which has different components or subsystems. The users interface is designed in a friendly manner (user friendliness), so that ease of use can be ensured. An ISAR system usually offers different approaches of searching, which may be achieved through strong indexing capabilities and facilities. Users also have choice to search through simple search, or advanced search mechanisms.

OBJECTIVES OF ISAR SYSTEMS

The principle objective of ISAR system is to provide correct information to the user in least time with least efforts. Thus, while designing any ISAR a system designer should keep following objectives in view:

Information facilitator

The ISAR system should act as facilitator between the information (contained in document) and the users. If a user approaches with the subject term, name of contributors or title of the document and so on, the system should be helpful to give him the desired information. The information could be exact information or the reference of a document which contains information.

Non-Ambiguous

The system should be so organized that ambiguity of information is avoided so that search result is free from any kind of ambiguity. This requires identification of terms, setting their context and their proper indexing. For example, search for a term 'screw driver' should not bring results like 'truck driver', 'hardware driver' and so on.

Minimum time

The system should be so designed that minimum effort and time are spent to interrogate the system.

User friendliness

Ease of use is an important consideration for any ISAR system.
Any ISAR should have user friendly interface. The important aspects of ISAR should be highlighted. Before a user uses the system he/she should be properly introduced to the system with all its features, i.e., informing users about the scope of system, available search options, and most importantly how to perform search with the system. It is only this interface through which a user operates an ISAR system. It is only this interface through which a user operates an ISAR system. Take an example of a library OPAC. It should have following features:

- Introduction to library
- Scope of collection
- Instructions for performing search
-

The search interface should facilitate framing the search like,

- Keyword search
- Author and title search
- Combination search (using Boolean operators)
- Proximity search, etc.

FEATURES OF ISAR SYSTEM

Keeping in view the objectives mentioned above and recognizing the aspects to be considered in designing a system, an ideal ISAR system should incorporate one or more of the following features:

- The competence and compatibility for consolidated searching and retrieval of information from any client terminal from any database within the system.

- It should be able to narrowcast or broadcast or relate the information need in a variety of associations to get optimum retrieval performance.
- It should have access facilities at multi-points.
- It should have common command language facility to retrieve information from several databases of the system.
- It should be able to handle information access from entity-related or object-oriented approaches. It may also provide all other associations for accessing information.
- In a bibliographic or full-text database, the surrogates chosen should have indicative as well as informative features that are sufficient enough to select or reject the retrieving information based on end-users needs.
- It should have the ability to select, classify, process and consolidate the analysed information into a cohesive text ready for assimilation by the end-users.
- It should have ability to orient the information to specialist needs of the users from time to time. This calls for understanding the processing of user profiles.
- It should be able to retrieve maximum information with minimum number of clues. The fuzzy approaches of end-users must be able to get clarified and ultimate result should provide satisfaction to the searcher.
- It should have capacity to interchange the information available in one database or another for purposes of retrieval relevance end usage.
- It should have bibliographic data interchange capacity (using Z39.50 or similar standard) to meet consolidation to a chosen format for networking and other purposes. Compatibility with standards at all levels must be the goal.
- It should have ability to search simple information quickly in an easy manner and also have the ability to multi-track the complex questions and present them in a simple easy manner. User-friendly presentations are very important.

TYPES OF ISAR SYSTEMS

ISAR systems are used by a wide range of users. According to different kinds of needs and purpose of use, different types of automated systems may be designed. Such types may be:

- Database Management System (DBMS)
- Text Retrieval System (TRS)
- Management Information System (MIS)
- Decision Support System (DSS)
- Knowledge Based System (KBS)

Database Management System (DBMS)

Any automated system is based on a collection of stored information or documents in a database which is amenable for access. A DBMS is primarily concerned with data storage, maintenance and retrieval and is used to keep control and manipulate data within the database.

The distinguishing characteristic in DBMS is the definite structure of the stored information, instead of dealing with natural language text. In DBMS, normally files of data are described by a small set of pre-specified attributes.
OPAC is a kind of DBMS often built of some kind of Bibliographic Database Management Systems (BDBMS). The typical example of BDBMS is the one built by CDS-ISIS/WINISIS developed by UNESCO. The data fields may contain author, title, place, publisher, year of publication and so on.

Text Retrieval System

In contrast to DBMS, text retrieval systems are designed for unstructured data such as full text documents. Queries are usually language based here such as, keywords and a number of advanced search techniques (such as proximity search) can be used. However, systems may also handle discrete structured data.

Management Information System (MIS)

Management Information System is a kind of database management system designed to cope up with the needs of managements who need to have information about different alternatives related to his/her interest to facilitate his work. Though built on DBMS platform, information are subjected to special processing. In such a system information is available with different alternatives.
Collection of data is critical in MIS because the information comes from different sources, i.e., within the organization or from outside organization. Collection of data not only needs defining that how the data would be captured but also the estimation of cost involved in data collection. Once the data are collected and organized such system generates reports for usage. The reports could be generated in printed or electronic form depending on desired format. Such systems also generate reports upon different intervals if it is desired.

Decision Support System (DSS)

Decision support systems help top-level management in arriving at decisions. There is very little difference between MIS and DSS. The former generates reports in anticipation or on demand and collect facts, whereas the later provides possible alternative solutions. These are interactive computer- based systems that provide the user easy access to decisions. In management parlance a structured decision means use of rules and norms for making decision. Such systems help managers in identifying the problem, analyzing alternatives and choosing possible solution. However, the typical decision-making takes place with shared effort of human and machine. In true sense, a DSS cannot take decision; rather it amplifies decision maker's capability by providing resources and facilities. In other words it provides intellectual support. These systems are integrated with powerful tools like generating charts, preparing tables and presentation tools.

Knowledge based system (KBS)

Specialised computer programs, modelled in the same way as human experts tackle problems and arrive at solutions, are called ' Expert systems'. Such systems rely upon a store of specialised knowledge for solving problems and hence referred to as knowledge based systems (KBCS) or knowledge based systems (KBS).

KBS systems are domain specific and are backed up by a strong knowledge base. In these systems each bit of information is not only stored but they are also linked. This is used to preserve the context. The context is used to draw the inference from a query. They are capable of providing solutions and replace the human intervention. Expert systems are thus data driven. But it is also important that how the given information is utilized to achieve the goal. Human experts possess procedural knowledge, which help them to flowchart the courses of action to be taken in solving problems. Accordingly, rules for manipulation of the knowledge have to be incorporated in the expert systems to get the desirable results. However, this procedure involves other related tasks such the des0rable results. However, this procedure involves other related tasks such as intuitive inference power, learning and updating of knowledge. Solutions to problems can be achieved if only all tasks are executed in a coordinated way.

DESIGN OF ISAR SYSTEMS

From the foregoing discussion, it should be clear that a number of features should be ingrained in an ISAR system. Thus, an ISAR system is an integrated one combining various aspects.

COMPONENTS OF AN ISAR SYSTEM

An ISAR system comprises of following components:

- User interface
- Knowledge base
- Search Agent

User interface

User interface is the part which puts users across the ISAR system. It is the front –end which enables user to put a query and displays results. Basically, user interface is of two types:

- Query interface
- Result interface

Query Interface

This is the end from where users enter his/her search terms. It is one of the major components which initiate communication between users and the system.

The query interface should have following features:

1. Understanding the user input statement
2. Refining the problem statement
3. Search statement to search strategy translation
4. Modification of search strategy

Result Interface

Display of search result is another important aspect of searching. It should be in user friendly manner. Not only should that result cater the need of individual users but ratings in the light of search terms. For this purpose statistical techniques can be used.

Knowledge Base

The store house of any ISAR system is its knowledge base. It contains list of facts or related facts (information). Any kind of query is answered based on the facts stored in the knowledge base. A knowledge base could from storage depend on two important aspects of knowledge Base:

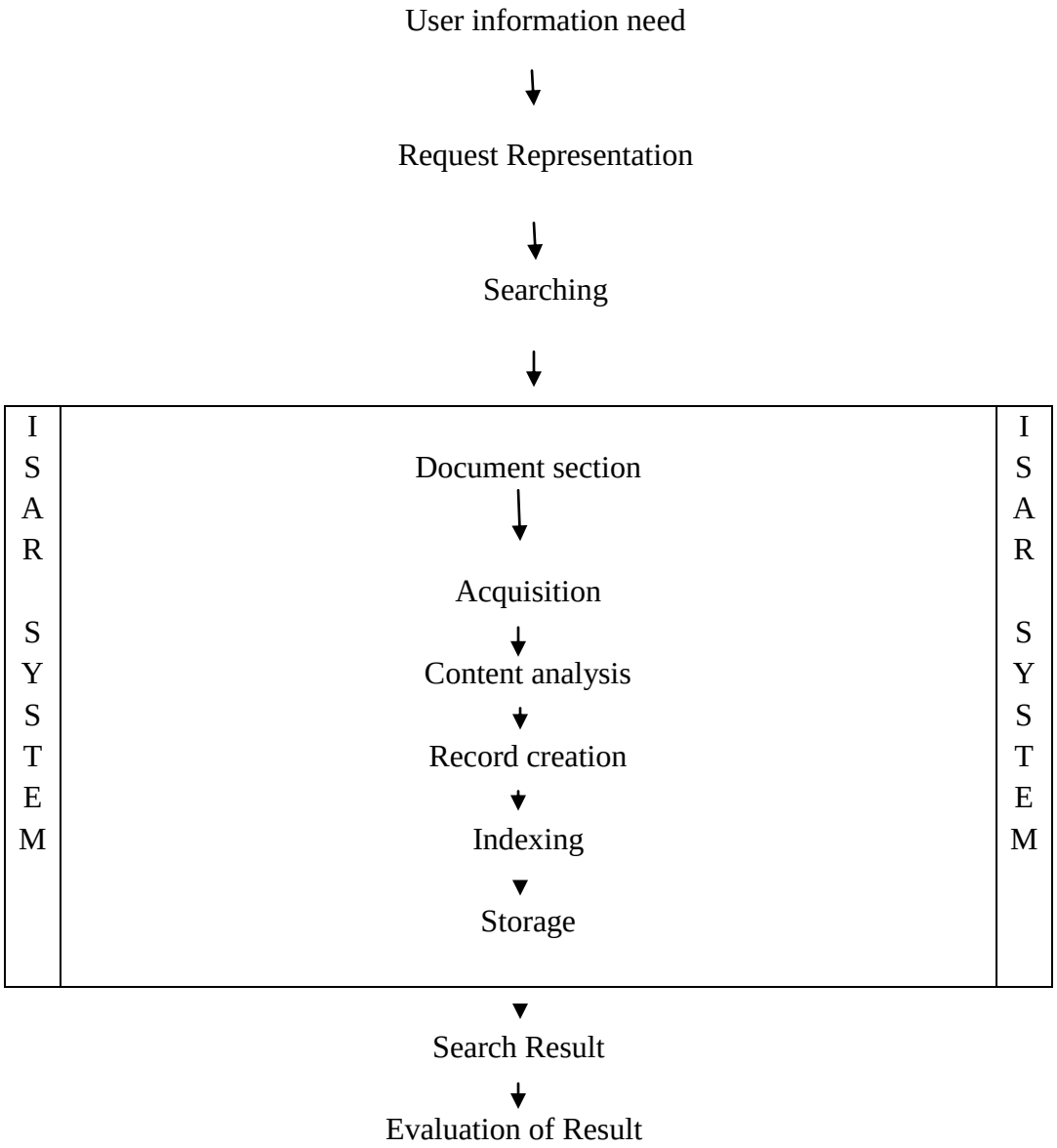
- Knowledge Representation
- Indexing and Clustering

Knowledge Representation

The first and foremost objective in constructing an ISAR system is representation of facts within the knowledge base. There are different ways of representation of knowledge.

FUNCTIONALITY OF AN ISAR SYSTEM

The object of an ISAR system is storage, processing and retrieval of information. In order to perform the above mentioned tasks, such systems are equipped with user friendly interface, powerful database management system and search agents. Information is represented inside the system in a machine readable inside the system in a machine readable format using frames or semantic networks or as rule base. Often systems are combination of above three or two methods. The overall objective of the system depends upon the need of users. Once needs of users are defined, it is easy to frame a system for the purpose.



Functional view of ISAR

EXAMPLES OF ISAR SYSTEMS

Library Catalogue has changed its from to the electronic form with the advent of computerisation and today it is called the OPAC (Online Public access catalogue).OPAC provides access to the documents by different approaches of users, such as Author, collaborator, title, subject, keyword, etc. An OPAC is built on Data base management system.

Digital Library

Online public access catalogues (OPAC) provides only bibliographic details not full-text information. This limitation led to development of full- text database in digital form. This kind of database is known as digital library. Digital libraries are available over network often using www.

Search Engines

www is itself is a big source of information. Almost everything and anything can be found over internet. Search engines provide a kind of interface for users to search the web. A search engine has three components:

1. A robot or web crawler
2. A database
3. An agent

Web crawler goes to each and every site over internet and indexes each word present in the page or sometimes few the page. This index is stored in search engines database with corresponding URL (Uniform Resource Locator). When a search query is given it searches in databases of search engine and result is generated.

Compatibility of online IR systems (ISAR System for Global Access)

Web has remarkably influenced transactions on the Net and made it truly interoperable. In the sense that when we are browsing the net and click on links and navigate between sites we seldom bother to know what operating system the distant machine may have because in the web environment it really does not make a difference. Hence, even if the library automations software of digital library software is configured on a UNIX platform the end users operations can be through web browsers so that users can be comfortable in familiar environment. Online IR systems are adhering to international and world standards to achieve true interoperability. MARK21 standard is followed for library catalogues. Most tools developed for data exchange between libraries are also geared up to the MARK21 standard.

Z39.50 standard and protocol

Z39.50 standard and protocol enables exchange of bibliographic record between libraries even though they may have different description standards. The standard is designed to facilitate interoperability between computer systems whether on internet or on intranet. The protocol does not deal with aspects of interaction between user and the origin or target machine. It only deals with interaction between origin and target machine. The essential functions are searching and retrieving information from database available on multiple hosts. The protocol basically specifies data structures and interchange rules that allow a client machine (origin) to search databases on a server machine and retrieve record.

In a typical implementation of Z39.50, the origin and the target should somehow translate their messages into a common language. Both the origin and target should be Z39.50 compliant. The origin's query should be mapped as Z39.50 query. On the target side the Z39.50 query should be mapped as its database query and the result are presented.

The Z39.50 standard does not broadcast searches to multiple servers, but a client can open Z39.50 sessions with multiple servers either sequentially or simultaneously. However, manipulating multiple results from different targets, removing duplicates and presenting retrieved records in a uniform fashion to the end-user are not covered by the protocol.

On the target side, the z39.50 gateway resides on the web server(like Apache or IIS) In addition, browser-based implementations using either java or active X applets reside on the target and are to be downloaded to the user's machine.

As no two databases are expected to be alike with regard to the structure (data elements) and searchable fields, it is required to develop a common abstract model of the target databases. The model should contain the abstract data structure having the data elements like author, title etc and also the searchable elements as all data elements need not be indexed.

Although Z39.50 is not a database indexing standard, Z39.50 profiles developed for specific communities require a commonly agreed upon database indexing standard. These profiles normally include a minimum set of access points and they should be supported by the database indexes to ensure interoperability between target systems.

The Z39.50 protocols also help in:

- Identifying the characteristics of the server database.
- Locating the database distributed across the internet.

CONCLUSION

Compatibility of ISAR systems can be achieved either by coordination among several system or through some mediating device. The mediating device acts as a switching mechanism which converts data output of one centre into a form usable by any other participating centre. The common communication format (CCF) is one such example of a mediating device.

To achieve compatibility of ISAR system it is essential that they are based on certain set standards. Standardisation of various structure and functions of ISAR system can help in achieving quality. The utility of ISAR systems depend on the compatibility and quality aspects, which can only be achieved through standardisation. ISO 2709, UNISIST Reference Manual, UNIMARC and common communication format, Z39.50, Dublin core are some of the examples of international standards that focuses on compatibility issues.

REFERENCES

1. Chowdhury, G.G (1994). Information retrieval system. Calcutta: IASLIC.
2. Ghosh, S.B. and satpati, J.N. (eds.) (1998). Subject indexing systems: concepts, methods and techniques. Calcutta: Indian Association of special Libraries and information centre's (IASLIC).
3. Knowledge representation in computer- supported environment. http://www.uia.org/knowledg/knowrep.htm
4. Knowledge representation. http://blackcat.brynmawr.edu
5. Lancaster, F.W. (1991). Indexing and abstracting: theory and practice. London library association.
6. Refdesk search engine. http://www.resdesk.com/newsrch.html.

Publish Research Article

Dear Sir/Mam,

We invite unpublished Research Paper,Summary of Research Project,Theses,Books and Book Review for publication.

Address:- Dr. Ashak Hussain Malik House No-221, Gangoo Pulwama - 192301 Jammu & Kashmir, India
Cell: 09086405302, 09906662570,
Ph No: 01933212815
Email: nairjc5@gmail.com, info@nairjc.com
Website: www.nairjc.com