EXPERT SYSTEM APPLICATION IN LIBRARY

Dr. Shaista Muqueem
Assistant Librarian
Dept. of Library and Information Science,
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, (MS) India

ABSRACT:-

Expert system represents one of the most advanced facets of Information Technology. Present paper gives meaning and definition of Expert system, a short overview and background of expert system and expert systems impact on library services.

KEY WORDS: *Expert systems, Application of Expert system of Library services, Expert systems for Library, Some expert systems for Libraries.*

INTRODUCTION

The Artificial Intelligence techniques are developed and applied to many subjects. There are computer programs developed to perform intelligent tasks. According to Patterson (1992), Artificial Intelligence is a branch of computer science with the study and creation of computer system. Artificial Intelligence techniques are attempting to create machines that can replace manual as well as mental power and intelligence of human beings.

Expert system represents one of the most advanced facets of Information Technology. Expert system is a branch of Artificial Intelligence. An Expert system is a set of programs that manipulate encoded knowledge to solve problems in a specialized domain that normally requires human expertise.

DEFINITIONS OF EXPERT SYSTEM

Cambridge International Dictionary of English defines an Expert system as a computer system which asks questions and gives answers that have been thought of by a human expert (Paul 1995).

Turbau and Aronson,(2001) explained Expert system as a system that uses human knowledge captured in a computer to solve problems that ordinarily require human expertise.

According to Kashyap(1999),An Expert system makes the knowledge of experts available to others in situations where they require expert knowledge , or support of knowledge of experts available to others in situations where they require expert knowledge, or support of knowledgeable people or professionals engaged in development and application in a well-defined area.

According to Harrod's Librarians Glossary. A Expert system is a computer system which embodies certain decision making processes relating to a particular subject; such as system comprises of five parts – a knowledge base, an inference machine, an explanation program, a knowledge refining program, and a natural language processor.

Expert systems are a recent product of artificial intelligence. In simple term, an expert system stores large amount of data and disseminate it in a systematic way as required by the users.

BACKGROUND HISTORY

Expert systems first emerged from the research laboratories of a few leading U.S. Universities during the 1960s and 1970s. The first v to be completed was DENDRAL used heuristic knowledge obtained from experienced chemists to help constrain the problem. After DENDRAL was completed, the development of MYCIN began at Stanford University. MYCINE is an Expert system which diagnoses infectious blood diseases and determines a recommended list of therapies for the patient. Several Projects directly related to MYCIN were also completed including a knowledge acquisition component called THEIRESIUS, a tutorial component called GUIDON, and a shell component called EMYCIN.EMYCIN was used to build other diagnostic system including PUFF, a diagnostic expert for pulmonary diseases.

Other early Expert system projects included PROSPECTOR, a system that assists geologists in the discovery of mineral deposit. Since the introduction of these early Expert system, numerous commercial and

military versions have been completed with a high degree of success, the range and depth of application has broadened dramatically and applications can now be found in almost all areas of business and government.(Patterson 2002)

NEED FOR EXPERT SYSTEMS

There are several reasons for using expert systems.

- Expert systems can answer questions and solve problems much faster than the human expert.
- Due to the capabilities of computers of processing a huge number of complex operations in a guide & accurate way, expert systems can provide both fast and reliable answers in situation where the human experts cannot.
- Expert system can be used to perform monotonous operations and other that are boring or uncomfortable to humans.
- Substantial savings can be achieved from using expert system.(Patil D.B. 2004)
- Human get tired from physical or mental workload, expert system cannot.
- Human have limited working memory and unable to process complex, large amount data.
- Humans lie, hide and die. He may also retire or transferred from his job while the expert system is also available.
- Expert system does not forget or never make mistake in calculation.

LANGUAGE OF EXPERT SYSTEM

- List Processing Language – LISP.
- Logic Programming Language-PROLOG.
- Object Oriented Language-SMALLTALK
- Conventional Programming Language – Pascal, FORTRAN, C, Basic.

Expert systems can be developed by writing programs by using certain Programming languages. Such as Pascal, FORTRAN, C++, Visual Basics and Dbase. Most of the Expert systems are developed via splendid software toll called shells which are readymade software Packages. (Mukherjee 2012)

APPLICATION OF EXPERT SYSTEMS IN LIBRARY & INFORMATION SYSTEM

Having achieved remarkable success in industry and commerce, expert systems are now denuding the frontiers of library & information system.

Brooks and Jones observed that subdivision of library & information science field are suitable for application of expert system.(Shukla 2008)

With the development of powerful and affordable computers, libraries try to implement expert systems. Ford suggested some expert system that can be developed for professional tasks in both traditional & non-traditional library & information services and management tasks. Following are some expert system in the major divisions of librarianship.

CLASSIFICATION

CUTT-X, an expert system for automatic assignment o cutter number was developed using Microsoft ACCESS relation database, the system performed well for the International civil aviation organization Library (Savic 1996).

Shelf Pro developed by (Drabenstott, Riester and Dede1992) addresses shelflisting. Shelflisting is concerned with assigning a book number, as opposed to the class mark position of the call number to an item.

Cosgrove and Weimann (1992) describe how the n-cube expert system development tool can assist in item classification using the Universal Decimal Classification (UDC) standard.

Pekka Valkonena and Olli Nykanen developed Prototype IPC expert system for Patent Classification.

CATALOGUING

There are nearly 2000 rules in AACR 2 revised edition. The cataloguing activity is a rule based activity. Expert system works on logic & reasoning based on some rules. Library Cataloguing is systematically maintained through expert system. There are two well known expert system is available in cataloguing: MAPPER & CATALYST developed by (Gibb & Sharif 1998) developed at University of California at Los Angeles.

Maccat, developed at the University of California used Apple Hypercard environment. For establishing headings together with their MARC field and sub field codes. Natural Agriculture Library (NAL) developed Cat-tutor, for training catalogues to provide descriptive cataloguing of computer files.

Hjerppe, Oskins and Marklund (1985,1989) conducted the well known ESSCAPE project in Sweden Weibel, Oskins and Vizine-Godz (1989). They build a prototype rule-based expert system at OCLC known as OCLC Automated Title Page Cataloguing Project to automate descriptive Cataloguing from title pages.

COLLECTION DEVELOPMENT

The expert systems also developed for acquiring different kinds of documents and collection development in libraries. Using PROLOG program, system process responses and help in determining whether or not the material should be added to the collection.

Journal Expert Selector (JES) was developed by Roy Rode (1987) to capture the expertise of human journal selector at National Library of Medicine.

The Bibliographer's workstation, developed by Meador and Cline (1992) at south-west Missouri State University.

REFERENCE SERVICES

One of the earliest systems developed to answer routine was REFLESI developed at the University of California, Los Angeles. DISTREK is an expert system to link with a unit catalogue or CD-ROM in new southwest Mc Donald and Weckert (1990). In Johnson Library of Government Documents of stand for University developed the Government Document Reference Aid (GDRA). National agriculture Library developed ANSWERMAN. It provides link to well popular database o agriculture AGRICOLA. In order to provide referral service PLEXUS expert system is used. In order to provide online assistance during online database search, assistance during online database search, TOMSEARCH is very popular source finder SOFI is used by new reference libraries as a training aid.

INFORMATION SERVICES

Marcus and Reintjes developed the connector for Networkal Information Transfer (CONIT). The Composite Document Expert CODER system was developed by Fox (1987) as attest bed for analysis, Filing etc.

INDEXING

FASIT (Dillon &Gray 1983) was one of the first systems for automatic indexing purpose. The Med Index system assist index to select the most appropriate indexing terms from MESH. Index Expert used frames to represent the bibliographic records of reference sources.(Mukherjee 2012)

CONCLUSION

The Information and Communication Technologies and database techniques have compelled Library and Information Centers to use these technologies to render services. New Artificial Intelligence techniques are developed and applied to many subjects. Expert system is a branch of Artificial Intelligence. It was developed during 1970s and applied commercially throughout the 1980s. Expert system represents one of the most advanced facets of Information Technology. Expert systems are sophisticated computer program that manipulate knowledge to solve problems efficiently. Expert systems will be of a great value to the Library Profession. Library will be able to deliver effective services to its users if Expert systems are developed.

REFRENCES

- Bivins, K.T. and Palmer, R.C. (1980): REFLES on individual microcomputer system for Factor Retrieval. Online Review.4 (4).
- Cosgrove. S.J. and Weimann, J.M. (1992): Expert system Technology applied to Item Classification. Library Hitech 10 (34).
- Dillon M and Gray A.S. (1983): FACIT: a fully automatically based indexing system. Journal of the American Society for Information Science. 34(2)99-108.
- Drabenstott, Karen Markey, Lesliec Reister and Bonnie, A.Dede (1992): Shelflisting using Expert system in Classification Research for Knowledge Representation and Organization, Amsterdam; Elsevier.
- Fox, Edward A.(1987): Development of the CODER system: a test bed for artificial intelligence methods in information retrieval. Information Processing and Management. 23(4) 341-366.
- Gibb, Forbes and Corydon Sharif (1988): CATALYST; an expert assistant for cataloguing. Program. 22(1), 62-71.
- Harrods Ed., (1971): Harrod's Librarian Glossary. London; Ebnezen Baylis.
- Hirppe, Ronald, Birgitta Olander and Kari Marklund (1985): Project ESSCAPE Expert system for simple choice of access points for entries: applications of artificial intelligence in cataloguing. Paper Presented at 51st IFLA General Conference 18th-24th august 1985. Chicago; Illinois.

- Kashyap, Madan Mohan (1999): Computer based Library & Information in system designing Technique: New Delhi Sterling Publishers pvt.ltd.
- McDonald, Croug and Weckert, John (1990): DISTREF a prototype distance referral system. In Libraries and Expert systems. London; Taylor Graham, pp.28-37.
- Meador, John M. and Cline, Lynn (1992): Displaying and utilizing selection tools in a user-friendly electronic environment. Library Associations: Practice and theory 16 pp 290-294.
- Mukherjee, Bhaskar (2012): Information Communication and society. New Delhi; Ess Ess Publications.
- Patil, D.B.(2004): Expert system: An Overview.Ramesh Basn and Gopal Krishan (eds): Information Communication, Library and community Development. Fetschriff volume in honor of Prof. C.P. Vashith. Delhi; B.R. Publicating Corporation pp:665-675.
- Patterson, D.W. (1992): Introduction to Artificial Intelligence and Expert systems, New Delhi; Prentice Hall of India.
- Paul P. ed. (1995): Cambridge International Dictionary of English. New Delhi; CUP.
- Rada Roy (1987): Computerized guides to Journal selection. Information Technology and Libraries 6,180.
- Savic, Dobrica (1994): Designing an expert system for Classification of office documents- a case study of CLOD ARMA Quaterly 28(3).
- Sukula, Shiva (2008): Information Technology. Bridge to the Wired Virtuality. New Delhi; Ess Ess Publications.
- Turban, E. and Aronson, J.E. (2001): Decision Support systems and intelligent systems. Sixth edition. New Delhi; Prentice Hall.
- Weibel, Stuart, Oskins M., and Diane Vizine-Goetz. (1989): Automatic Title Page Cataloguing: a feasibility study. Information Processing and Management. 25(2)187-203.