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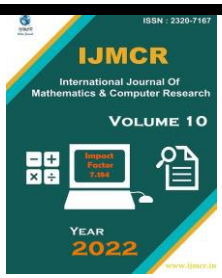

Artificial Intelligence in Library; Managing Bibliographic Data with Knowledge Base System

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ABSTRACT

This study discusses Artificial Intelligence in Library; Managing Bibliographic Data With Knowledge Base System In library activities such as indexing, cataloging, literature selection, archiving and references can be assisted by an expert system. Building an expert system using the Knowledge Base System in the library must be supported by command languages, output formats, database coverage, and the existence of literature search facilities including operations to correct errors when searching for information. The research was conducted by collecting information from various sources, then examining library services that could utilize artificial intelligence and explained descriptively. It is not as easy as turning the palm of the hand to bring artificial intelligence in the library. But once it is done, the library becomes a center of knowledge that is not boring. Even libraries can be present online in cyberspace.

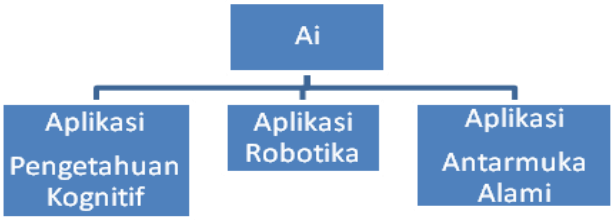
KEYWORDS: artificial intelligence; expert systems; knowledge base system; information technology; library

1. INTRODUCTION

Manual libraries are out of date. Technology has replaced human labor in the form of artificial intelligence to get maximum results. One of the functions of technology in library management is as a tool for processing library materials. The speed and accuracy of processing library materials are important, because they greatly affect the search for information sources owned by the library. Libraries have built their knowledge over several years of existence by recording them as books, journals/articles, documents, etc. There are a series of Information Technology (IT) applications that can help the performance of librarians, even those that resemble artificial intelligence aka Artificial Intelligence (AI). Artificial intelligence is a branch of computer science that deals with capturing, modeling, and storage of human intelligence into an information technology that can later be used for decision making. The era of searching for books manually in the library is likely to be over soon. You no longer need to be tired of looking for the title of the book or author you want. Computerization has helped the performance of librarians become much simpler and easier. Especially now that many artificial intelligences have been developed that resemble human intelligence so that they can replace the role of librarians in carrying out performance in libraries. Computerization has helped the performance of librarians become much simpler and easier. Especially now that many artificial intelligences have been developed that resemble human intelligence so that they can replace the role of librarians in carrying out performance in libraries. Computerization has helped the performance of librarians become much simpler and easier. Especially now that many artificial intelligences have been developed that resemble human intelligence so that they can replace the role of librarians in carrying out performance in libraries.

This system will work well if the scope of knowledge is deep and can be clearly defined[1]. The expert system in question is an expert system [2], which is a computer software that contains expert knowledge and experience and uses an inference engine that resembles an expert's way of solving problems. So this software almost resembles human intelligence which is part of the Knowledge Base System (KBS), also part of Artificial Intelligence (AI). Knowledge Base System can be a system whose knowledge is updated automatically (machine learning) or updated manually (manual update). The user interface is useful as a liaison between the system and the user. shows the basic architecture of the Knowledge Based System [3]. Knowledge Base System itself can be classified into five types, namely expert systems,

Building an expert system in a library must be supported by a command language, output format, database coverage, and the existence of literature search facilities including operations to correct errors when searching for information. According to O'brien in Kadir and Terra [4] and Dewi [5], the grouping of artificial intelligence application domains can be seen from the following figure:



Expert system	Visual	Natural
Learning System	Perception	Language
Blurred Logic	Stimulation	Conversation
Genetic	Dexterity	Introduction
Algorithm	Driving Force	Multisensory
Neural Network	Navigation	Interface
Smart Agent		Virtual
		Reality

Figure 1. Main Application Domains of AI (Kadir and Terra, 2003) in Dewi (2020)

Based on the description above, the author feels the need to raise the theme of this research with the title "Artificial Intelligence in Library; Managing Bibliographic Data With Knowledge Base System". Due to the wide range of technical service activities for cataloging management in the library, the limitation of the problem in this research is the technical processing of library bibliographic material processing. An expert system of knowledge-intensive computer programs. contains a lot of knowledge about specialization using Knowledge Base System. The formulation of the problem is how to process library materials using Artificial Intelligence? The research objective is to analyze the processing of library materials using the Knowledge Base System. The expected benefits are 1) Adding insight, knowledge.

2. METHOD

The research method uses a qualitative method with a descriptive approach, namely describing variables in the past, present or currently happening. Sugiyono[6] provides an overview of the processing of library bibliographic materials using the Knowledge Base System expert system. The research was conducted by collecting information from various sources, then examining library services that could utilize artificial intelligence and explained descriptively. Collecting data using the library method through reading, recording and processing research materials from various literatures on the processing of library materials [7]. Sources of data used are primary and secondary data. This research is supported by observational data, namely systematic observation and recording of the condition of processing library materials directly.

3. RESULTS AND DISCUSSION

Application method used for indexing in the library

Knowledge Base System Expert System activities by selecting databases, determining keywords and making search strategies. To present an expert system in a library, it means that there must be internet access that is hosted. For the sake of the complete presence of an expert system in the library, databases, subject areas, indexes, thesaurus, classifications, codes, search mode reformulation techniques, subject domains, including semantic structure, vocabulary and semantic relations between terminology, are also required.

presents a classification of the research sub-domains in Artificial Intelligence, based on the topics list provided by the International Journal of Knowledge-Based and Intelligent Engineering Systems[8].

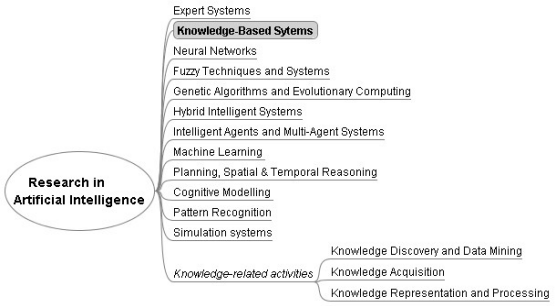


Figure 2: Research in Artificial Intelligence (based on the list of topics provided by the International Journal of KnowledgeBased and Intelligent Engineering Systems, 2004)

Expert system software that has been widely used in libraries, such as Cansearch and MenUse, which help create search statements in the Medline database, in the field of health in cancer therapy. This system uses the help of the menu on the computer screen or menu driven with the touch terminal technique, not using a keyboard. The application domain of artificial intelligence can be seen as follows

Name	Utility	Field of Work
Machine Aided Indexing (MAI)	Another expert system that is also applied for indexing purposes, namely . This app was created by the American Petroleum Institute.	Indexing
Intelligent Computer Assistance	Other areas of library work such as indexing can be	Indexing

(ICA)	helped by those already successfully practiced by the US National Library of Medicine.	
MedIndEx	Popular software in this index field is one of the prototypes of a research expert system for interactive knowledge-based indexing of medical literature using Medical Subject Heading (MeSH). This system can produce indexes from its knowledge base in the form of frames, acting as a computer system to index consistently and precisely.	Indexing

Application method used for cataloging in the library

Meanwhile, for the field of cataloging and classification, software was developed that determines the number of book classifications and determines the title of the subject. An example of an expert system for cataloging artificial intelligence application domains can be seen as follows:

Name	Utility	Field of Work
Online Catalog Library of Congress(OCLC)	*Automated Title Page Project*. This system was developed to generate bibliographic descriptions according to the standards of the Anglo American Catalog Rules (AACR2). This system can correctly identify bibliographic elements about 73 percent.	Cataloging

Application method used for classification in the library

Based on the information in the bibliographical elements of a title to be classified. When a rule (one or more facts) matches a node in the tree, it is verified through the user or fact knowledge base and its classification number is extracted. The node sub-tree can then be searched to determine a more specific extension to the base number as desired. The application domain of artificial intelligence can be seen as follows:

Name	Utility	Field of Work
CUTT-X	An expert system for automatic assignment or number cutting was developed using the Microsoft ACCESS database link, a well-performing system for the International Civil Aviation Organization Library [11]	Classification of Library Materials
Shelf Pro	developed by Drabenstott discusses shelving lists. Shelflisting is concerned with assigning a book number, as opposed to the position of the class mark from the call number to the item [10].	Classification of Library Materials
N-Cube:	The N-Cube expert system reported by Cosgrove is an example of the use of expert system technology. to assist in the classification of library materials using UDC. This system combines superficial knowledge which is usually represented as rule production and deep knowledge usually represented in frame structure (representing classification knowledge as integration of object-oriented structure with related rules and hypotheses).	Classification of Library Materials
IPC:	Pekka Valkonena and Olli Nykanen developed the IPC expert system prototype for patent classification.	Classification of Library Materials

Application methods used for reference activities in the library

Another activity assisted by the expert system is reference. This activity is a broad activity, ranging from answering questions about directories to literature searches. One expert system called Comit performs a batch search of information through bibliographic data. Batch is a search that can be extended to other sources of information such as dictionaries and atlases. Examples of expert systems for reference consulting are Pionter, Answerman or Aquaref, Flexus, ORA and DISTREF. The application domain of artificial intelligence can be seen as follows

pointer	It is a microcomputer program to simulate the work of librarians in tracing government documents. This system was developed by the State University of New York, USA. Created with the aim of providing guidance to users of government documents in university libraries. The advantage of this system lies in the questions addressed to the user to find out their needs. The computer language used is Basic using a menu system.	Circulation Service
Answerman and Aquaref	The expert system was developed by the National Agricultural Library, USA. This is a computer-based system that can help library users in finding appropriate sources of information, including answering their questions.	
Flex	is the development of scientists from The Central Information Service University of London. This system was created to guide users in searching for information on the plantation sector. The computer language used is Pascal. This system can do almost the same as a librarian or librarian in carrying out their activities of making references.	

If all this can be completed then a librarian can be replaced by an expert system. Of course, it does not need to be replaced in the true sense, but only to lighten the task.

4. CONCLUSION

It is not as easy as turning the palm of the hand to bring artificial intelligence in the library. Many examples of the application of artificial intelligence can be used in libraries. Actually, if it can be applied, it can definitely improve the image of the library itself. Because if you look at libraries today, there are still not many that apply artificial intelligence. To implement artificial intelligence in libraries, librarians can work closely with information technology experts. They can discuss what artificial intelligence is suitable to be applied in a library, or will it be made based on the wishes or needs described by the librarian. It should also be borne in mind that to implement a new technology requires sufficient funds, and requires adaptation of librarians and users in its use. Requires a lot of knowledge and costs are not small. But once it is done, the library becomes a center of knowledge that is not boring. Even libraries can be present online in cyberspace.

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