A Study On Artificial Intelligence Libraries Of Indian Society: In Overview

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Abstract: AI is one of the important areas of computer/data science allowing a machine to perform tasks in a way similar to a human performing them. Its main goal is to give machines the ability to process information and make decisions based on that information, in the same ways humans do. However, the science and the industry of AI are far from being fully explored and developed. AI is becoming increasingly prevalent in many applications; it is not going to completely replace human operators. In the long run, AI is expected to enhance human abilities and be the dominant technology of future libraries.

Keywords: Information Technology, Hardware, Library automation Technology.

Introduction: IA the invention of computers, humans have been developing various approaches to increase operational speed and decrease physical size in diverse types of hardware and applications. While expanding the uses of computer systems, humans were interested in exploring whether a machine can think, work and behave like a human. a science and a set of computational techniques that are inspired by the way in which human beings use their nervous system and their body to feel, learn, reason, and act".

Definitions of Artificial intelligence.

1. **John McCarthy:** Artificial intelligence is "the science and engineering of making intelligent machines, especially intelligent computer programs". In other words, AI can be defined as "a branch of computer science by which we create intelligent machines which can think like humans, act like humans, and able to make decisions like humans."

2. **Bellman**: "The automation of activities that we associate with human thinking, activities such as decision making, problem-solving, learning."

AI is composed of two words, "artificial" and "intelligence," where "artificial" stands for "human created' and "intelligence" stands for "thinking power." In other words, AI is "a man-made object with thinking power'.

Types of AI

AI can be classified into seven types depending on the performance of machines (https://www.javatpoint. com): reactive machines, limited memory machines, theory of mind, self-aware, ANI, AGI, and ASI, as briefly explained below (Rouse, 2020).

1. **Reactive machines**: Reactive machines are conventional types of AIs that possess only limited capability to simulate the ability of the human mind. Reactive machines work without memory-based functionality, so they cannot correct their present actions based on their past experiences. Therefore, these machines are not capable of "learning." They study the surroundings and select the best solution among the possible ones. A well-known example is Deep Blue, the IBM chess program that defeated Garry Kasparov in the 1990s (Joshi, 2020).
2. **Limited memory**: As is clear from the name, these AI systems have a small amount of memory, and thus very limited capacity to apply past experiences to new decisions. This group includes, among others, chatbots, virtual assistants, and self-driving vehicles. Many existing applications fall under this category of AI.
3. **Theory of mind**: This is a psychological term. Theory of mind is the future AI systems that are presently planned to be developed (Tucci, 2020). When applied to AI, these systems are expected to have the social intelligence to understand emotions.
4. **Artificial Narrow Intelligence (ANI)**: The ANI is also known as Weak AI, that is, the one designed and trained to undertake only one particular type of work (Rouse, 2020). This definition includes all the existing AIs, including the most complicated ones. Any AI that utilizes ML and DL to teach itself may be called an ANI. Since the ANI performs only a specific task autonomously due to its programming limitations, it has a very limited or narrow set of competencies.
5. **Artificial General Intelligence (AGI)**: The AGI is also known as Strong AI. Its program can replicate the cognitive abilities of the human brain. It can perform a variety of tasks, as well as learn and improve itself. It is a self-teaching system that can outperform humans in a large number of disciplines. It provides the ability to perceive, understand, learn, and function as humans do.
6. **Artificial Super Intelligence (ASI)**: The ASI will probably be the future AI research area, as it would be the most capable intelligence in the world. The ASI will not only replicate the intelligence of human beings but also have much higher storage (i.e., memory), faster data analysis, and better decision-making powers. The capabilities of ASI are expected to supersede that of humans. The AGI and ASI are expected to create

a big revolution in the future, but they also may threaten our way of life. An example of ASI includes the Alpha 2, which is the first humanoid ASI Robot (Rouse, 2020).

Advantages of Artificial Intelligence

1. Can take on stressful and complex work that humans may struggle cannot do;
2. Can complete tasks faster than a human can most likely
3. To discover unexplored things e.g., outer space;
4. Function is infinite.

Disadvantages of artificial intelligence

1. Lack of human touch
2. Has the ability to replace human jobs.
3. Can malfunction and do the opposite of what they are programmed to do;
4. Can be misused leading to mass-scale destruction.
5. May corrupt the younger generation.

Processes Involved with AI

The AI programs will have cognitive skills: reasoning, problem-solving, learning, perception, and self-correction, as given below.

1. Reasoning process: The AI program here focuses on selecting the most appropriate algorithm to achieve the required results. It is the process that is used for making judgments, decisions, and predictions. Reasoning processes are mainly categorized as inductive reasoning and deductive reasoning.

2. Learning process: Its function is acquiring data and creating rules in order to devise actionable information from data. Learning improves understanding of the subjects under study. The rules, also called algorithms, help provide sequences of instructions to perform a task using computing devices. It involves acquiring knowledge by way of study, practice, and gaining experience. Humans, some animals, and AI-based systems have the ability to learn (Rouse, 2020).

3. Problem-solving process: It is used to get the required solution from the current situation by taking another approach. Problem-solving may include decision-making, i.e., selecting the best out of several possible alternatives to get the objectives.

4. Perception process: It includes selecting, acquiring, interpreting, and ultimately analyzing the information. In the case of humans, perception is supported by sensory organs. Perception mechanisms in AI place the sensor's data together in a useful manner.

5. Self-correction process: It is designed to continually refine the algorithm so that it determines the most accurate results.

Future of machine learning towards mind thinking:
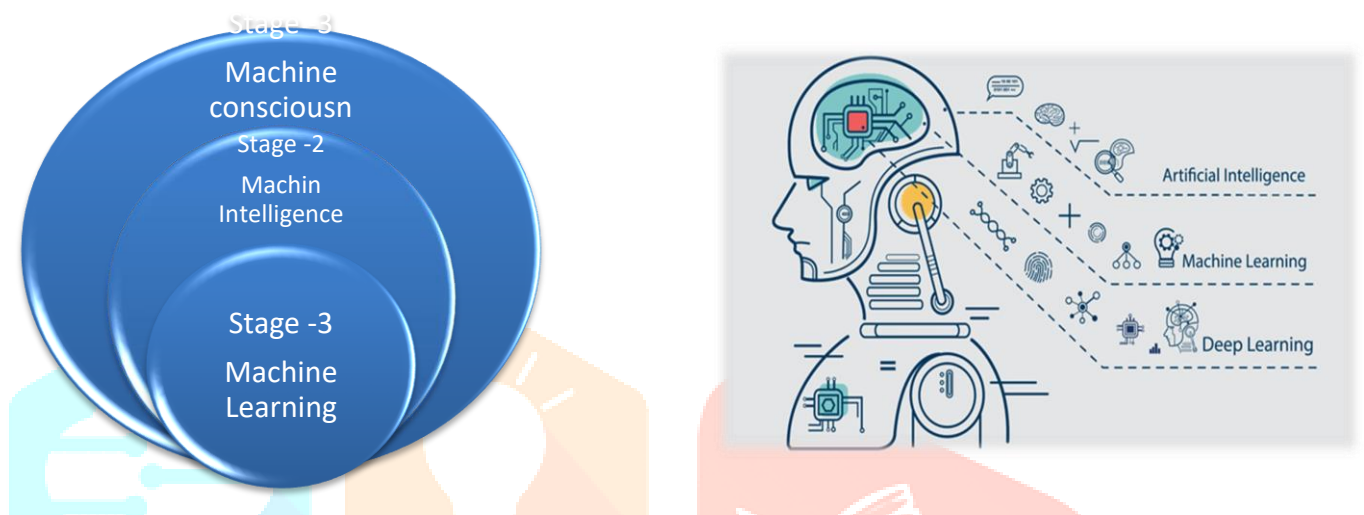
What is the deferent between IA and machine learning deep learning

Deep Learning: The subset of machine learning composed of algorithms that permit software to train itself to perform tasks, like speech and image recognition, by exposing multi-layered neural networks to vast amounts of data.

Machine Learning: A subset of AI that includes abstruse statistical techniques that enable machines to improve at tasks with experience. The category includes deep learning**.**

Artificial Intelligence: Any technique that enables computers to mimic human intelligence, using logic, if-then rules decision trees, and machine learning (Including deep learning).

➢ An Expert System helps the librarian realize the need to improve library operations and services.

➢ A well-programmed Expert System improves the quality of the operations and services.

**Application of expert system in the library areas of classifications include**

1. **Coal sort**: Coal sort consists primarily of a frame-based semantic network and the software needed to allow users to display portions of it and to move around in conceptual structure. This conceptual browser was designed to serve either as a search or an indexing tool. The expert knowledge in the system is embodied almost entirely in the semantic network.

2. **The Environmental Pollution Expert (EP.X)** assists users in conducting subject searches. The interviews and observations of expert document indexers preceded the design of EP-X. Consequently, frames were used to represent topics in the EP.X knowledge base. Studies of expert human intermediaries indicated several salient functions that EP-X performs during online searches. First, they tended to decompose the overall problem of finding relevant documents into smaller sub-problems. These include identifying and negotiating the requester's topic of interest, finding an initial neighborhood and then refining ie (broadening or narrowing) the topic interactively with the requester. Secondly, when a requester expressed an interest in a concept, the intermediary would make the semantically natural inference of the word.

3. **BIOSIS**: is also known as an indexer aid. It is a knowledge base that includes a significant amount of procedural knowledge to assign documents to categories automatically. BIOSIS uses the information on the titles of biological documents to assign as many categories as possible of those that would be assigned by human indexers. The indexing language is structured and is a practical representation of information that can be used to very good advantage of expert system applications.

4. **CUTT-X:** This is an expert system for the automatic assignment of cutter numbers, developed using Microsoft Access relation database, the system performed well for the International civil aviation organization library (Savic cited in Rahi 2019).
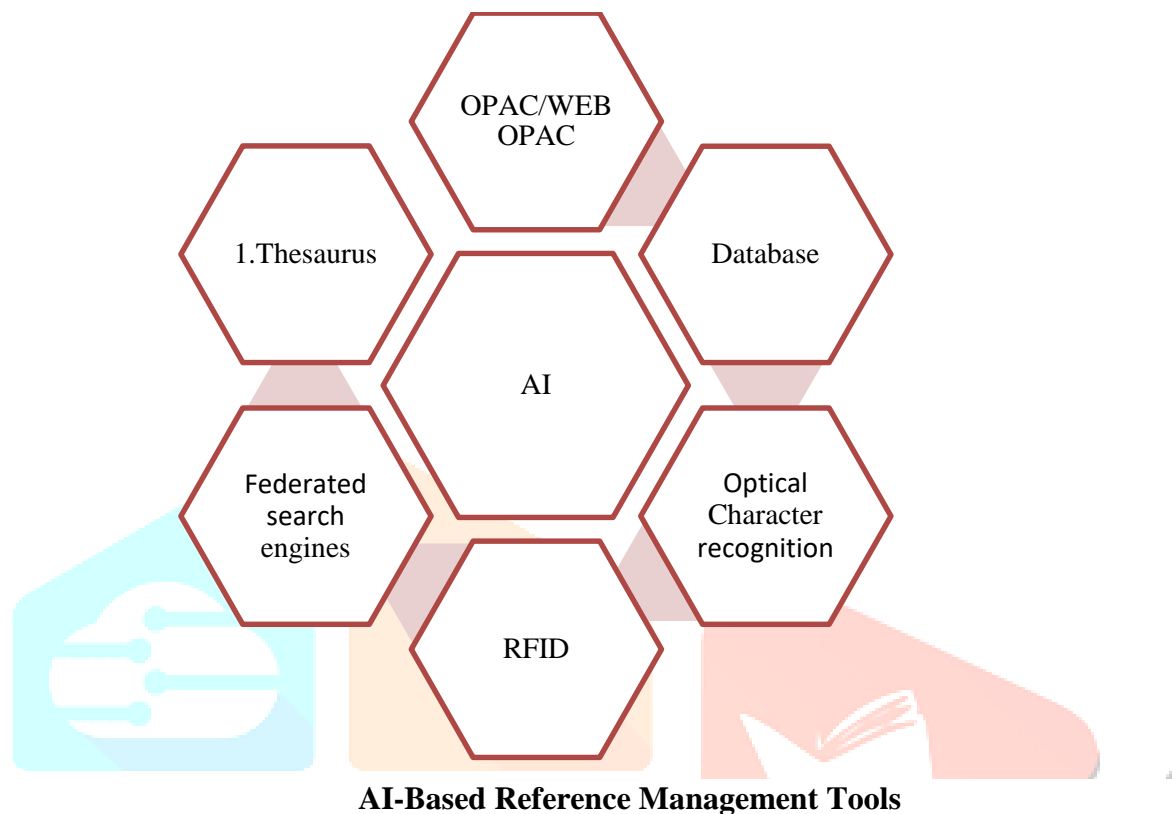
Focused on descriptive cataloging because it is considered rule-based (AACR2)

- A Human-Machine Interface.

- An Expert System with full cataloguing capability.
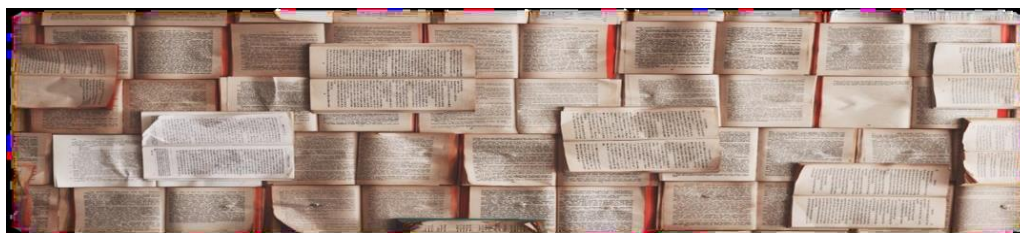
The Expert System works as a substitute for a reference librarian.

➢ Ask Librarian

AI-Based Reference Management Tools

RESEARCH

- Can be used to teach students reference skills.

- As a computerized aid for practicing reference librarians and information specialists.

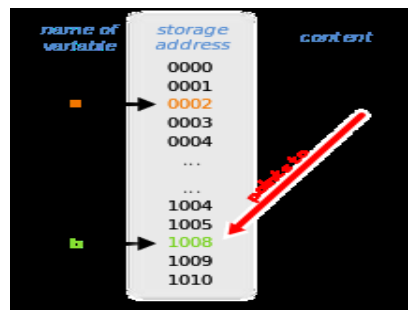Asacomputerizedaidforpracticingreferencelibrariansandinformationspecialists.

PLEXUS

A referral tool used in *Public Libraries*

POINT

Directs the user of the refence resource

Best software for references

Zotero   Mendeley   EndNote   Citavi   RefWorks

Challenges of Implementing Artificial Intelligence in Libraries.

Artificial intelligence systems are generally not in operational use in most libraries today.

The limitations to implementing artificial intelligence systems in libraries include the following:

1. Lack of technical know-how to use and operate artificial intelligence systems among the library staff.

2. Lack of adequate funding to develop or procure artificial intelligence systems in libraries. Since the budgets for hardware and software are frequently tight, there's always a constraint to the type of system the library can purchase or develop.

3. High system development and maintenance cost of artificial intelligence systems in libraries.

4. Erratic power supply to power artificial intelligence systems in libraries especially in developing countries.

5. Inherent complexities of expert/artificial intelligence systems' development.

6. Limited natural language capabilities.

7. Intelligent systems lack that common base of human knowledge, severely constraining the types of functions that they can perform.

8. Limited amount of artificial intelligence experts among library automation vendors. The field of artificial intelligence is complex and thus, requires specialized knowledge in that aspect far beyond the development of conventional.

The benefits of artificial intelligence in libraries.

1. According to Ex Libris (2019), artificial intelligence in libraries can make research more discoverable which can boost research productivity among faculty members, 136 Artificial Intelligence in Libraries

2. **Bridge in Time:** Round-the-clock accessibility to information resources and services just in time.

3**. Bridge in Space:** The space occupied by piles of books, journals, bound newspapers, and other information materials has been reduced by the introduction of digitization, electronic copies, and the use of robotic cranes that store and retrieve books from a compact off-site storage location.

4. **Maximization of Efficiency:** This refers to efficiency in library operations: selection and acquisition of materials, technical services, circulation services, reference services, serial management, etc.

5. Maximization of effectiveness in the form of improved service delivery and elimination of human errors in library operations.

6. **Minimization of Effort**: The effort expended by librarians in technical services, circulation services, references services, serial management etc, can be minimized by the use of artificial intelligence systems in libraries.

7. Enhanced and immersive user experience in library services delivery.

Conclusion:

Despite AI's promises to bring forth new opportunities, there are certain associated risks that need to be mitigated appropriately and effectively. To give a better perspective, the ecosystem and the sociotechnical environment in which the AI systems are embedded need to be more trustworthy. library work nature it should save time and develop the technical issues.

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