

MACHINE PROBLEM 1:

INTRODUCTION TO KNOWLEDGE REPRESENTATION

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INTRODUCTION TO A.I AND KNOWLEDGE REPRESENTATION

ARTIFICIAL INTELLIGENCE

The term artificial intelligence describes the branch of computer science that focuses on building machines that are capable of learning, thinking, and solving problems or tasks that need human-like intellect.

FUNDAMENTAL A.I FUNCTIONS

- Data Processing: analyzing and interpreting data to spot trends and patterns.
- Learning: Based on prior experiences, learning algorithms are used to enhance performance.
- Making Decisions: Based on current information and acquired knowledge, makes well-informed decisions.

IMPORTANCE OF KNOWLEDGE AND REPRESENTATION

- Considering knowledge representation enables AI systems to efficiently organize, comprehend, and use data, it is essential.
- It makes it possible for AI to analyze data, forecast outcomes, and pick up new knowledge.

TYPES OF KNOWLEDGE REPRESENTATION

Semantic Networks

- Structures based on graphs, in which concepts are represented by nodes and their interactions by edges.

Example:

- AI - Powered Customer Support System

wherein product categories, customer problems, and help solutions may be mapped using a semantic network in an e-commerce platform's customer care system.

Frames

- used in customer relationship management and other systems that require organized data.

Example:

- Travel Booking System
 - frames can be used to represent various aspects of travel reservations, such as flights, hotels, and rental cars.

Logic-Based Representations

- Allows for deductive reasoning by using formal logic to express world facts and norms.

Example:

- Legal Contract Review System
 - Legal contracts are reviewed by an AI system to make sure they adhere to organizational norms and the law.

CASE STUDY OVERVIEW

A.I - Powered Legal Document Analysis

Application Overview:

Natural language processing and machine learning are used by AI-powered legal document analysis systems to efficiently evaluate and analyze legal documents.

HOW KNOWLEDGE IS REPRESENTED?

In AI-powered legal document analysis, knowledge is represented in several ways. Semantic networks show how different parts of a document relate to each other, like connecting a clause to its legal implications. Frames organize key details of the document, such as who is involved and what terms are included. Logic-based representations use rules to check if the document follows legal requirements and find any errors or missing information.

KNOWLEDGE REPRESENTATION MODEL

Problem: Analyzing a contract to find legal issues and make sure everything is in order.

- The AI system creates a compliance report, pointing out any missing terminology or possible mistakes and recommending changes as necessary.
- Inconsistencies or missing pieces are automatically detected by the model, saving time and effort when manual review is needed and ensuring that the contract complies with legal requirements.

CONCLUSION

AI systems need effective knowledge representation because it gives them an organized method of understanding, processing, and reasoning about data. Artificial intelligence can manage complicated data, recognize linkages between disparate bits of information, and use logical reasoning to make defensible conclusions by organizing knowledge in forms like frames, semantic networks, and logic-based rules.

AI systems can assure accuracy, solve issues more quickly, and adjust to changing circumstances thanks to this systematic method. For example, efficient knowledge representation enables the AI to rapidly verify compliance in the context of legal document analysis, cutting down on mistakes and saving time.

This exercise taught me how various knowledge representation techniques have varied applications and how combining these techniques might improve an AI's performance. I also acquired understanding