

A Review of the Advantages of Knowledge Based System over the Conventional Computer Based Information Systems

Binumon Joseph
Master of Computer Applications
Amal Jyothi College of Engineering
Kottayam, India
binumonjosephk@amaljyothi.ac.in

Rini Kurian
Master of Computer Applications
Amal Jyothi College of Engineering
Kottayam, India
rinikurian@amaljyothi.ac.in

Meera Rose Mathew
Master of Computer Applications
Amal Jyothi College of Engineering
Kottayam, India
meerarosemathew@amaljyothi.ac.in

Abstract—A knowledge-based system (KBS) is a program that absorbs and uses knowledge from a different source, learning, and other activities. Since, its large significance within the space of AI, it will assist and support human decision making with solving problems, notably complex problems. Decision making is based on the data and information that resides in their database. KBS has the flexibility to form sense of the information that is processed. The early knowledge-based systems were primarily expert systems, this term is usually used interchangeably with expert systems, though there is distinction. The distinction is in visible purpose and manner of description regarding the system. A knowledge-based system is consisting of a knowledge base and an interface engine. The knowledge base functions can act as the knowledge repository and the also the interface engine is there as the search engine.

I. INTRODUCTION

Along with the expert systems, alternate applications of knowledge-based systems comprise hypertext manipulations systems real-time process control, CASE-based systems intelligent tutoring systems, databases having an intelligent user interface, and problem-solvers for specific domains such as protein structure analysis, construction-site layout, and computer system fault diagnosis.

The Key distinction between knowledge-based system and a traditional program is its structure [1]. In an exceedingly ancient program, there is a software system which is linked who play as a controller of the application of the particular knowledge. But within the case of knowledge-based system, there are separate entities; a knowledge base and an interface design.

II. COMPARISON STUDY OF KNOWLEDGE-BASED SYSTEM AND CONVENTIONAL COMPUTER BASED SYSTEM

The main difference of knowledge-based systems from conventional computer-based information system is the canny way of handling bulk amount of unstructured data. Knowledge based systems provide magnificent documentation. KBS helps users in decision making and helps to work with high productivity and consistency.

When we compare knowledge-based systems to traditional computer-based information systems, we are able to find several benefits. KBS is useful to reserve information

for future use. Knowledge based systems has the ability to generate new knowledge from the reserved information. It has its own platforms for integrating information. They are capable of handling abundant unstructured data in an exceedingly good manner and conjointly provides a well organised documentation.

Another advantage of knowledge-based systems is that, it will assist expert decision making. It conjointly makes user to figure at high level of expertise. Knowledge-based systems play an eminent role when an expert is not available and, in the situations, when we are lacking an expertise suggestion to take an intelligent decision [2].

Conventional computer-based information system is used in learning management, content management kind of areas while, Knowledge based systems are applicable in medical areas for accurately diagnosing diseases, in the field of industry as machine fault diagnosis and financial management.

III. ADVANTAGES OF KNOWLEDGE-BASED SYSTEM OVER CONVENTIONAL COMPUTER BASED SYSTEM

Knowledge-based systems are well efficient to distribute Expertise and contributes to organizations to unravel there logical misunderstanding in decision making. it fulfil the users with consistent answers. This system is simple to update comparatively same as the conventional system. It's one amongst the most advantage is that. Finally, the knowledge base which has the expert knowledge encoded as rules that is solutions to old problems represented as cases.

IV. OPERATIONS PERFORMED BY KBA

Given are three operations which are performed by KBA used to reflect the intelligent behaviour:

TELL: This operation tells the knowledge base what it absorbs from the environment.

ASK: This operation asks the knowledge base what action it should perform.

Perform: It performs the particular action.

A. A generic knowledge-based agent

- function KB-AGENT (percept):

- persistent: KB, a knowledge base
- t, a counter, initially 0, indicating time
- TELL(KB, MAKE-PERCEPT-SENTENCE(percept, t))
- Action = ASK(KB, MAKE-ACTION-QUERY(t))
- TELL(KB, MAKE-ACTION-SENTENCE(action, t))
- $t = t + 1$
- **return** action

The knowledge-based agent takes concept as input and returns an action as output. The agent maintains the knowledge base, and it has some background knowledge about the real world.

Each time when the function is called, it performs its three operations:

- Initially, it TELLS the KB what it perceives.
- Secondly, it asks KB what action it should take
- Third agent program TELLS the KB that which action was chosen.

The MAKE-PERCEPT-SENTENCE generates a sentence as setting that the agent perceived the given percept at the given time.

The MAKE-ACTION-QUERY generates a sentence to ask which action should be done at the current time.

MAKE-ACTION-SENTENCE generates a sentence which asserts that the chosen action was executed.

B. Various levels of knowledge-based agent:

A knowledge-based agent can be viewed at different levels which are given below.

1) Knowledge level

Knowledge level is the Initial level of knowledge-based agent, and in this level, we need to specify what the agent knows, and about the goals of the agent. Based on these, details, we can fix its behaviour

2) Logical level:

At this level, we will get, how the knowledge representation of knowledge is stored. At this level, sentences are encoded into different logics. At the logical level, an encoding of knowledge into logical sentences takes place.

3) Implementation level:

This is the physical representation of logic and knowledge. At the implementation level agent perform actions as per logical and knowledge level.

Approaches to designing a knowledge-based agent:

There are mainly two approaches to build a knowledge-based agent:

- a) **Declarative approach:** We can create a knowledge-based agent by initializing with an empty knowledge base and telling the agent all the sentences with which we want to start with. This approach is called Declarative approach.

- b) **Procedural approach:** In the procedural approach, we directly encode desired behaviour as a program code. Which means we just need to write a program that already encodes the desired behaviour or agent.

However, in the real world, a successful agent can be built by combining both declarative and procedural approaches, and declarative knowledge can often be compiled into more efficient procedural code.

V. BENEFITS OF KNOWLEDGE BASES

companies can rely on a knowledge base for internal or external use. Internal knowledge bases keep track of all the expertise that exists within an organization and provide a way for employees to access and study the stored information. In the case of external knowledge bases are for the general and are existing to increase general knowledge about the organization's product or service, or a the aera where they want to establish their expertise. External knowledge bases often take the form of an FAQ page, a help desk, how-to articles, or other support features [3].

An internal knowledge base provides an organization and its employees the following benefits:

- Quick and consistent knowledge transfer
- Standardized problem-solving methods and answers.
- A reliable way to handle unstructured human knowledge.
- Increased availability of expert knowledge to lower-level employees
- Community of collaboration and collective problem solving.
- Lowered training costs

In addition to those listed above, an external knowledge base provides an organization with the following additional benefits:

- Satisfied customer demand for information
- Increased resolution rates
- Happier customers

From developer's perspective, KB system has two main components:

- Intelligent program
- Development environment

Typical case-based knowledge application system will consist of the following processes:

- Search the case library for similar cases.
- Select and retrieve the most similar case(s).
- Adapt the solution for the most similar case.
- Apply the generated solution and obtain feedback.
- Add the newly solved problem to the case library [4].

VI. REQUIREMENTS FOR KNOWLEDGE REPRESENTATION SYSTEM:

A good knowledge representation system must possess the following properties.

A. Representational Accuracy:

KR system should have the ability to represent all kind of required knowledge.

B. Inferential Adequacy:

KR system should have ability to manipulate the representational structures to produce new knowledge corresponding to existing structure.

C. Inferential Efficiency:

The ability to direct the inferential knowledge mechanism into the most productive directions by storing appropriate guides.

D. Acquisitional efficiency:

The ability to acquire the new knowledge easily using automatic methods [5].

VII. CONCLUSION

Knowledge-based systems have a great demand, but also face some challenges like a smaller number of knowledge engineers with necessary skills; the less efficiency of available tools and overly specific problem domains. Most knowledge-

based systems deal with very specific problem domains, and that will not undertake or support a finished activity, but rather one or two activities within a sequence or cluster of tasks. The benefit that such software offers is not necessarily to automate the process completely and cut costs drastically, but to help the user to complete the task faster, somewhat more cheaply, and probably more accurately.

VIII. REFERENCES

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