

Expert Systems: Need, Applications, Components

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Abstract: Expert systems are used for making and designing the intelligent solutions and systems that can take decisions without the help of any other person. Expert systems are domain specific means for particular type of field say medical line then the medical field will be considered while designing the expert system for medical line. Expert systems are used in many areas and these systems have lot of application areas. These systems are full of amazing and highly intelligence. This research paper focuses on the various important aspects related to the expert systems

Key Words: Intelligent , Domain , Amazing , Computing.

1. INTRODUCTION:

In the field of artificial intelligence, Expert system is an important thing that is used for making and designing the intelligent systems that can take decision with the help of knowledge base.[1] Various applications are designed and developed so that many complex problems related to any particular domain can be solved with high intelligence.[2] Such type of Intelligent applications are known as expert systems that are made for any particular domain means they are domain specific systems. [3] Expert systems have high performance and accuracy as compared to normal decision making systems. [4] Expert systems are more reliable and very responsive to various queries.

2. NEED:

Expert systems can take the decisions that are complex and difficult for humans to take. These type of systems makes the process of taking a decision related to any complex problem, more easier. These systems do not use complex traditional procedures for taking decision but uses if then else rules for taking the decision or decision making process .These systems works as a human expert or specialist of any particular domain.

3. Components: Various components of expert systems are shown in the fig.1.

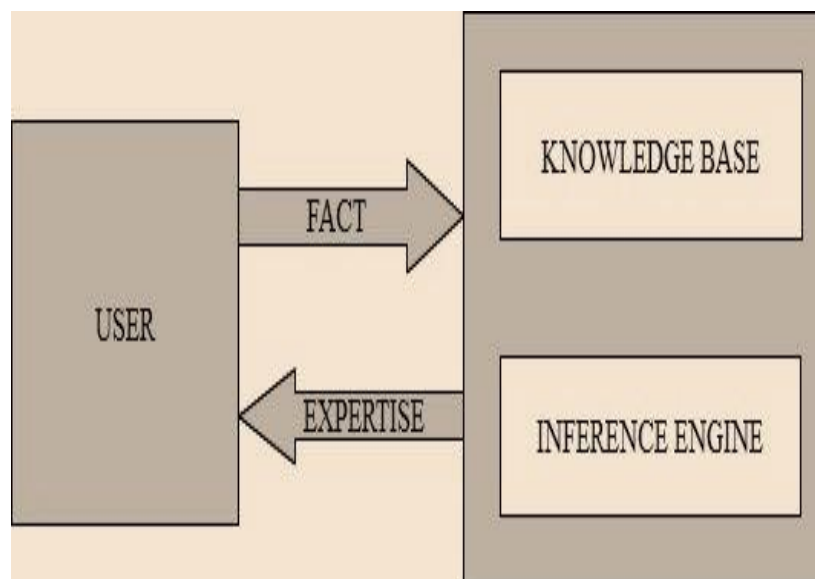


Fig. 1:COMPONENTS OF EXPERT SYSTEM

Explanation of expert system's components is given below:-

- **Knowledge Base:** Its name says about it that it is really a base of expert system, because it contains the knowledge about the particular domain for which expert system is designed. But, while preparing the knowledge base it should be kept in mind that knowledge should be reliable and related to the domain for which expert system is going to be designed. Knowledge base includes various types of knowledge like heuristic knowledge or factual knowledge .Sometimes ,they may contain both type of knowledge including factual and heuristic knowledge. Knowledge acquisition is necessary before making knowledge base by using various techniques that are used by knowledge engineers.
- **Inference Engine:** Inference Engine uses various rules and methods for taking the knowledge from knowledge base and then comes at a specific solution. Means for getting a meaningful solution form knowledge base, inference engines are used. Inference Engines use two types of methods -forward chaining and backward chaining.
- **User Interface:** The another important thing in expert system is user interface. User interface is an interface between the user who will use the expert system and the expert system which is used by user. User Interface uses the natural language processing for making the interaction between the user and expert systems.

4. Charateristics: Various characteristics of Expert system are given below-:

- Expert systems have high performance as compared to traditional decision making systems. That's why performance of expert systems have higher performance.
- Expert systems are understandable means they can understand the queries given by the user to the expert system and they can easily give answer to the queries of user.
- Expert systems are very responsive. These systems provide quick response to the queries given by the users to the expert system.
- Expert systems are reliable than other traditional decision making systems it means users of the expert system can rely on these systems for decision making.

5. Features: Various features and capabilities of the expert systems are-:

- These systems are capable of giving the advise or decision for any particular problem or question such as medicine for particular patient in case of medical expert system.
- Expert systems can be used for giving the instructions or can work as assistant to provide the assistance for various purposes.
- These type of decision making systems are also used for diagnosis purposes like diagnosis the condition of any patient.
- Expert systems are also used for or to justify the solution for any particular decision with their reasoning power which comes from inference engine.
- Expert systems are also used for interpreting the various types of inputs that is given to the expert system. For this it uses the inference engine.

6. Applications: There are numerous applications of expert systems. Some of them are given below-:

- Expert systems are used in finance sector for finding out various possible frauds in case of commerce and find out the transactions that looks suspicious.

- Expert systems are used in designing process of things like automobiles designing process or any other equipment's designing process.
- These type of systems are used in finding various type of faults or defects that occur during the manufacturing process of the various mechanical parts or vehicles or computers and so on.
- Expert systems are also used for monitoring various operations and processes where process control is required or where it is required to compare the past observations related to one thing with present observations.
- These type of systems are also used in medical line also. These systems are useful for diagnosis the condition of patient by comparing the past observations of the patient with the present observations.

7. ACKNOWLEDMENT:

While making this research paper, I have put all of my best and possible efforts for making this research paper. I hope this research paper will be useful and helpful for the authors who want to do further research in the field of Expert systems.

8. CONCLUSION:

There is no doubt that expert systems have make the process of decision making more simple and easier. It was very difficult to take decisions by using traditional decision making systems due to complex procedural codes. But, in case of expert systems only if then rules are used so expert systems are more easier to use and they are capable of making the decisions for any particular domain. In future, the use of expert systems will be increased.

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