DPBS(PG) College, Anoopshahr

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Expert System

An Expert System can be defined as an interactive and reliable computer-based decision-making system which uses both facts and heuristics to solve complex decision-making problems. It is considered at the highest level of human intelligence and expertise. It is a computer application which solves the most complex issues in a specific domain.

The expert system can resolve many issues which generally would require a human expert. It is based on knowledge acquired from an expert. It is also capable of expressing and reasoning about some domain of knowledge. Expert systems were the predecessor of the current day artificial intelligence, deep learning and machine learning systems.

Characteristic of Expert System
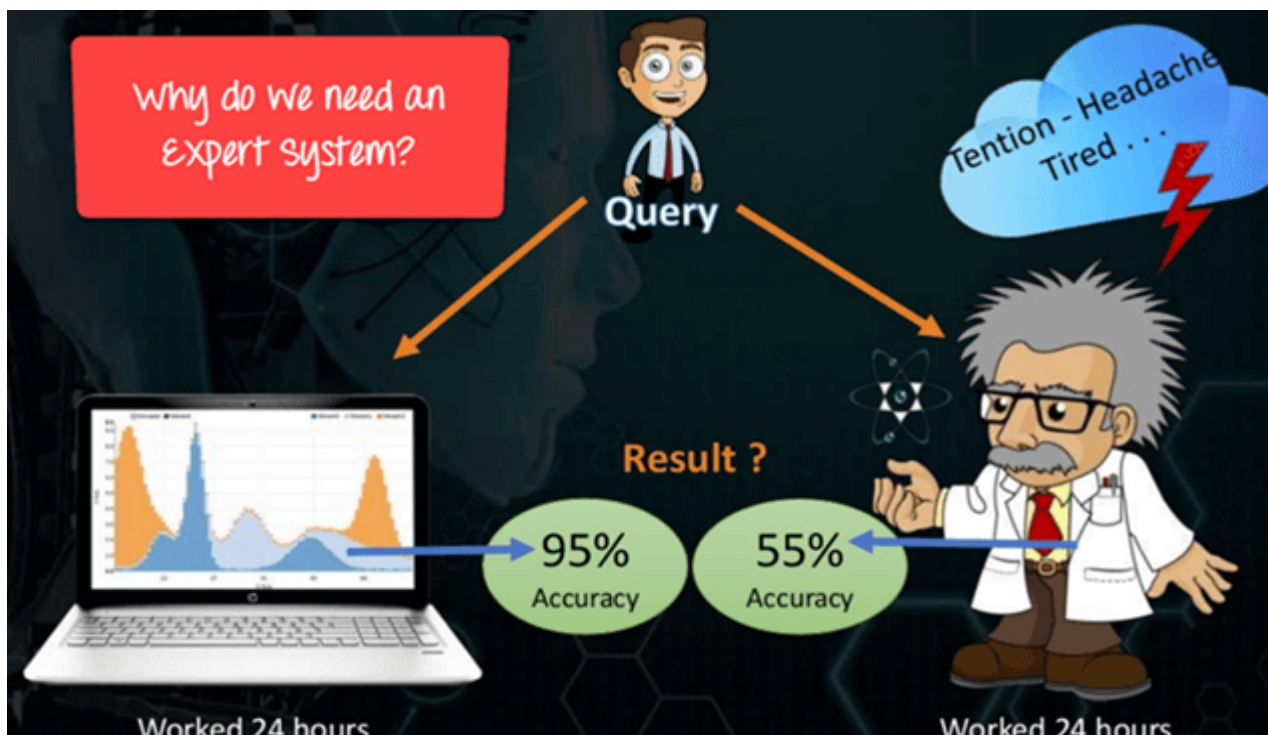
Requirements of Expert System

- The Highest Level of Expertise: The expert system offers the highest level of expertise. It provides efficiency, accuracy and imaginative problem-solving.

- Right on Time Reaction: An Expert System interacts in a very reasonable period of time with the user. The total time must be less than the time taken by an expert to get the most accurate solution for the same problem.

- Good Reliability: The expert system needs to be reliable, and it must not make any a mistake.

- Flexible: It is vital that it remains flexible as it the is possessed by an Expert system.

- Effective Mechanism: Expert System must have an efficient mechanism to administer the compilation of the existing knowledge in it.

- Capable of handling challenging decision & problems: An expert system is capable of handling challenging decision problems and delivering solutions.

Components of the expert system
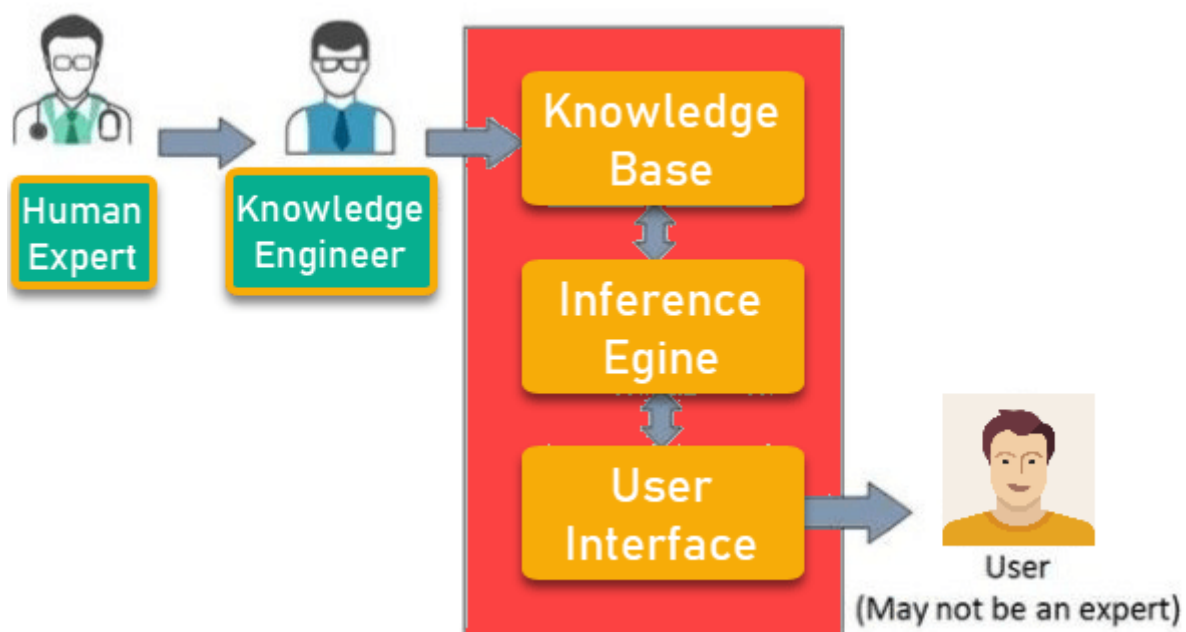
The expert System consists of the following given components:

User Interface

The user interface is the most crucial part of the expert system. This component takes the user's query in a readable form and passes it to the inference engine. After that, it displays the results to the user. In other words, it's an interface that helps the user communicate with the expert system.

Inference Engine

The inference engine is the brain of the expert system. Inference engine contains rules to solve a specific problem. It refers the knowledge from the Knowledge Base. It selects facts and rules to apply when trying to answer the user's query. It provides reasoning about the information in the knowledge base. It also helps in deducting the problem to find the solution. This component is also helpful for formulating conclusions.

Knowledge Base

The knowledge base is a repository of facts. It stores all the knowledge about the problem domain. It is like a large container of knowledge which is obtained from different experts of a specific field.

Thus we can say that the success of the Expert System mainly depends on the highly accurate and precise knowledge.

Business Expert Systems

A Business Expert System (BES) is a knowledge based information system, which is based on artificial intelligence. A Knowledge Based information system adds a knowledge base that uses its knowledge about a specific, complex application area to act as an expert.

Also, BES provides decision support to managers in the form of advice from an expert in a specific problem area such as medical, engineering and business. BES is interactive in nature and it is able to answer the questions asked by a user. For answering the questions, an expert system searches its knowledge base for facts

and rules and explains its reasoning process and results in the expert advice to the end user. The main components of BES are:

1)   Knowledge base

2)   Inference engine

3)   User interface

Components_of_BES
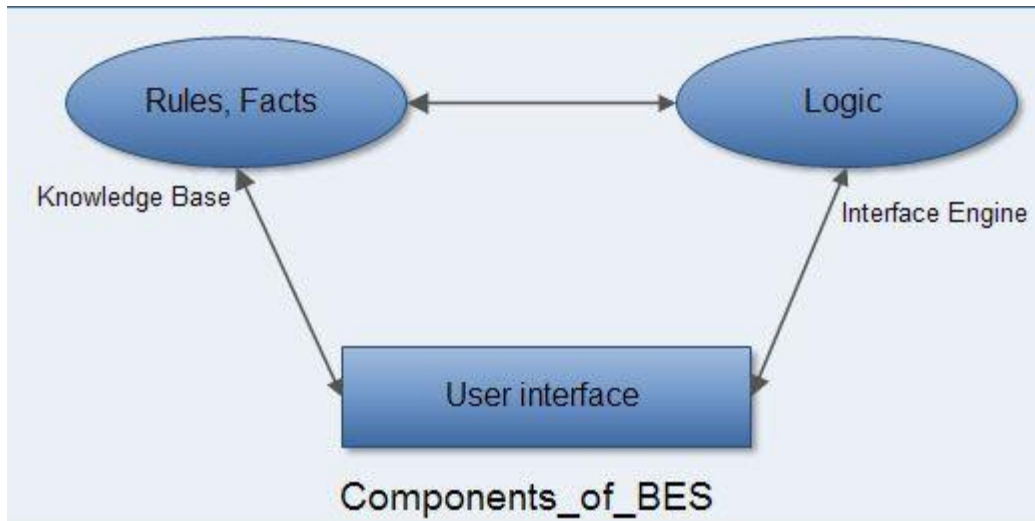
Knowledge base contains the facts about the specific expert area and heuristics that describe the reasoning procedures of an expert on the subject.

The inference engine contains the logic of reaching an inference from the stored data and from the knowledge base.

Expert systems may be developed by using either the programming language like LISP, PROLOG or C or by using the expert system packages. Using the expert system packages, one can design an expert system that combines the features of DSS and expert systems. This integration makes the application development process easier and faster for the end users.