Expert systems

An expert system is a computer program that simulates the judgement and behavior of a human or an organization that has expert knowledge and experience in a particular field. Typically, such a system contains a knowledge base containing accumulated experience and a set of rules for applying the knowledge base to each particular situation that is described to the program. Sophisticated expert systems can be enhanced with additions to the knowledge base or to the set of rules.

An expert system has a unique structure, different from traditional [computer programming](http://en.wikipedia.org/wiki/Computer_programming). It is divided into two parts, one fixed, independent of the expert system: the inference engine, and one variable: the knowledge base. To run an expert system, the engine reasons about the knowledge base like a human. In the 80s a third part appeared: a dialog [interface](http://en.wikipedia.org/wiki/Interface_(computing)) to communicate with users. This ability to conduct a conversation with users was later called "[conversational](http://en.wikipedia.org/wiki/Conversational_Programming_System)". There are five types of Expert Systems, Rule based, Object oriented, Logic based, Induction based, and Hybrid systems.

Expert systems have many advantages, for example it provides consistent answers for repetitive decisions, processes and tasks, also it encourages organizations to clarify the logic of their decision-making, it can work round the clock and never "forgets" to ask a question, as a human might more over a multi-user expert system can serve more users at a time.

Also the expert system has many capabilities like capturing, codifying, duplicating and transferring of the expertise. More over expert systems is capable of saving the human effort’s time and saving on the maintenance. Expert systems should be able to display the intelligent behavior, explain the reasoning, draw the conclusions from the relationships that are very complex in the nature, provide the much needed portable knowledge, and Limited to the narrow problems.

The spectrum of applications of expert systems technology to industrial and commercial problems is so wide as to defy easy characterization. The applications find their way into most areas of knowledge work. They are as varied as helping salespersons sell modular factory-built homes to helping NASA plan the maintenance of a space shuttle in preparation for its next flight.

An expert system has many limitations; the concept of the Expert Systems mainly involves a very narrow range of the codified domain, the Expert Systems are not generally adopted at managing the highly sophisticated sensory inputs, Expert Systems mainly function in the domain of the extracted, cognitive, logical thinking process, the different types of the multi – dimensional problems that are faced by the various users while performing the various activities, cannot be efficiently tackled by the Expert Systems, and some of the typical Expert Systems at times are not able to make available common sense knowledge and the broad – ranging contextual information.

On the other hand Expert Systems have some disadvantages; It lacks common sense needed in some decision making, cannot make creative responses as human expert would in unusual circumstances, d Domain experts not always able to explain their logic and reasoning, errors may occur in the knowledge base, and lead to wrong decisions, and also it cannot adapt to changing environments, unless knowledge base is changed.

Expert systems are part of a general category of computer applications known as [artificial intelligence](http://www.webopedia.com/TERM/A/artificial_intelligence.html) . To design an expert system, one needs a knowledge engineer, an individual who studies how human experts make decisions and translates the rules into terms that a [computer](http://www.webopedia.com/TERM/C/computer.html) can understand. It has many advantages, capabilities, conditions, disadvantages and limitations.

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