

Review of Expert Systems for Newborns

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Abstract - One of the most popular technology of AI is nothing but Expert system. It is rapidly growing technology. An expert system is a computer system that emulates, or acts in all respects, with the decision-making capabilities of a human expert. Expert systems have been developed in different areas like medicine, engineering and business. Author wants to review the expert systems for newborns.

Keywords – Artificial Intelligence, Expert system, rule-based system, knowledge engineering, medical system.

I. INTRODUCTION

In artificial intelligence, an expert system is a computer system that emulates the decision-making ability of a human expert. Expert systems are designed to solve complex problems by reasoning about knowledge, represented primarily as IF-THEN rules rather than through conventional procedural code.

An expert system is an example of a knowledge-based system. Expert systems were the first commercial systems to use a knowledge-based architecture. A knowledge-based system is essentially composed of two sub-systems: the knowledge base and the inference engine.

Expert systems are computer programs that are derived from a branch of computer science research called Artificial Intelligence (AI). AI's scientific goal is to understand intelligence by building computer programs that exhibit intelligent behavior. It is concerned with the concepts and methods of symbolic inference, or reasoning, by a computer, and how the knowledge used to make those inferences will be represented inside the machine.

The term intelligence covers many cognitive skills, including the ability to solve problems, learn, and understand language; AI addresses all of those. But most progress to date in AI has been made in the area of problem solving -- concepts and methods for building programs that reason about problems rather than calculate a solution.

There are following components of any expert system:-

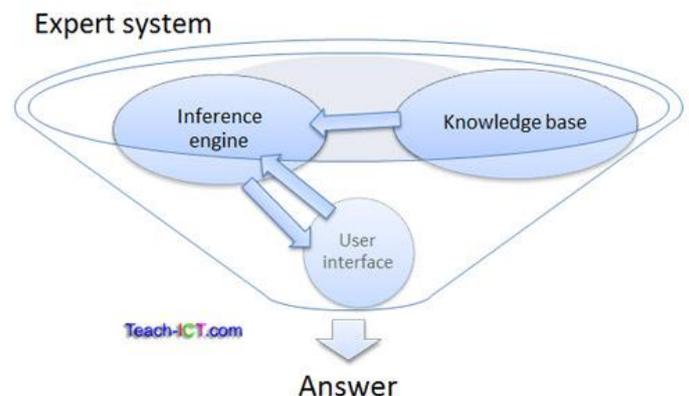


FIG. S STRUCTURE EXPERT S SYSTEM

II. THE USER INTERFACE

The user interface is the means of communication between a user and the expert systems problem-solving processes. A good expert system is not very useful unless it has an effective interface. It has to be able to accept the queries or instructions in a form that the user enters and translate them into working instructions for the rest of the system. It also has to be able to translate the answers, produced by the system, into a form that the user can understand. The screen design should be user friendly.

III. THE KNOWLEDGE BASE

The knowledge base stores all the facts and rules about a particular problem domain. It makes these available to the inference engine in a form that it can use. The facts may be in the form of background information built into the system or facts that are input by the user during a consultation. The rules include both the production rules that apply to the domain of the expert system and the heuristics and rules-of-thumb that are provided by the domain expert in order to make the system find solutions more efficiently by taking short cuts.

IV. INFERENCE ENGINE

The inference engine is the program that locates the appropriate knowledge in the knowledge base, and infers new knowledge by applying logical processing and problem-solving strategies.

V. KNOWLEDGE ENGINEERING

It is related to designing and building expert systems, and knowledge engineers are its practitioners. Knowledge

engineering is an applied part of the science of artificial intelligence which, in turn, is a part of computer science. Theoretically, then, a knowledge engineer is a computer scientist who knows how to design and implement programs that incorporate artificial intelligence techniques. The nature of knowledge engineering is changing, however, and a new breed of knowledge engineers is emerging.

An expert system can be built by following two ways:-

- 1) They can be built from scratch, or
- 2) can be built using a piece of development software known as a "tool" or a "shell."

Steps for development of an expert system:-

- 1) Gather the information or knowledge from experts
- 2) Design knowledge base and inference engine
- 3) Develop the system using computer language which will be accepted by end user

One of the main applications of expert system is medical expert systems. Like any other field in medical field it provides knowledge of doctors or other experts. So that in future that kind of problem will be solved by concerned person in a better manner.

- 1) MYCIN -Specifically designed to diagnose blood diseases and treatment
- 2) CENTAUR- It interprets pulmonary function tests.
- 3) ABEL- It was designed to provide expert consultation for electrolyte and acid-base disturbances.

A computer expert system is an alternative method of training and providing real-time clinical decision support for nurses to advance their practices from a novice to a proficient level.

VI. PREVIOUS EXPERT SYSTEM FOR NEWBORNS-

- 1) PNS-It stands for Parental Nutrition Solutions. It was developed by Department of Medical Cybernetics and Artificial Intelligence, the Austrian Research Institute for Artificial Intelligence, and the Neonatal Intensive Care Unit (NICU) of the Department of Pediatrics of the University of Vienna. It was developed for representing the clinical and theoretical knowledge about the composition of parental nutrition solutions for newborn infants treated at neonatal intensive care units (NICUs).
- 2) MVN- It stands for Mechanically Ventilated Neonates. It was developed by Jirapaet V. Firstly a prototype was developed and then developer studied its impact the clinical judgment and information access capability of nurses.
- 3) Expert-system classification of sleep/waking states in infants-It was developed by Dr.C.A.Holzman, C.A.Perez and team members. It will be used for automated classification of the sleep/waking states in human infants; i.e. active or rapid-eye-movement sleep (REM), quiet or non-REM sleep (NREM), including its four stages, indeterminate sleep (IS) and wakefulness (WA).

The system which author wants to design & develop will accept various symptoms of a newborn and it will give the solution for the given problem. It will be a rule-based system. The rules will be related to different problems of a newborn such as cold, skin allergy, stomachache etc. and the system will process the data based on the experts' knowledge stored in the system and then provide the best suitable answer.

VII. CONCLUSION

To solve any kind of problem we need the help from experts. Medical problem advice of expert doctor is necessary. The proposed system will be helpful for junior doctors and nurses for proper diagnosis of an infant.

VIII. REFERENCES

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