Investigate the Effect of Expert Systems Application on Management Performance

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Abstract

Data and information management in organizations has a vital and essential role. Whatever, information atmosphere of an organization be better, clearer, more consistent and more systematic, organization can achieve its goals better. Information is the most important sources under the authority of managers, so managers must be able to manage like any other resource. The most common information systems, which are used in organizations include: processing system operation, management information systems, decision support systems and expert systems. In this paper we try to explain a comprehensive definition of the impact of expert systems and its application in business area managers.

Keywords: Expert systems, artificial intelligence, management, organization

Introduction

When organizations are faced with complex problems, often uses experts in the field, for consulting. These individuals have specific knowledge and experience in this field. They recognize options, the chances of success, and trade benefits and losses. An organization brings together experts for non-structured situations. Actually expert system attempt to mimic human experts. In other word, expert system is a set of software that can be used for decision making to the level of an expert, or even beyond, in specific field to solve problems.

Expert Systems or (Knowledge based information system), refer to special category of software in order to help human specialist or partial replacement of them in limited areas of specialization. Main Root of expert systems, returns to field of study called (Artificial intelligence) and expert systems, owe their existence to Artificial intelligence (Macleod,1998).

1. Artificial intelligence

(John McCarthy) – That mentioned as father of knowledge to produce intelligent machines used the term artificial intelligence in 1956 and defined it as "science and engineering of making intelligent machines". If we want to determine the area of artificial intelligence we should say: is the study of how we can force computers do the things that currently human are doing it better

Artificial intelligence is a machine that can think (Arab Mazar Yazdi, 2010)

Artificial intelligence is a young and extensive knowledge that considered highly. This field, in 1950, with testing (Alen Turing), was established. (Russell, 2004)

Artificial Intelligence is to enable the computer to perform tasks that humans as intelligent beings do them.

Turing expresses act of a smart machine like:

"The best criterion for counting a smart car is that machine could convince someone with Teletype in a way that the person imagines faced with a human.

And in short, a system that has one of the following conditions, called the intelligent system:

1. Systems that think logically
2. Systems that act logically
3. Systems that think like humans
4. Systems that act like humans
2. Expert systems

Expert Systems are programs that mimic the behavior of an expert human in a particular field. This program uses the information that user stored in them to express an opinion on a particular topic. Thus, expert systems until they find something that matches your answers continue to ask from you.

According to Bruce Buchanan, knowledge-based systems, often called expert systems. It uses the knowledge of human to solve problems that require intelligence.

The data that will be used in such a system is called expert knowledge. (Habibi Pirkohy, Shaemy Barzaki, 2005)

Expert systems or Knowledge based information system is the systems that apply their knowledge in a specific and complex field of application and acts as a specialist adviser for the final user. Expert systems answer to questions about specific problems by inference, including inference of human knowledge that is experts in the field. Expert systems should be able to explain the reasoning process and conclusion for the final user.

Expert Systems (ES), are intelligent computer software that in them expert knowledge of specialists that gather as a set of scientific data.

This system not only possesses information but also an argument that logical thought and with using searching ways (algorithms) do the logical inferences. (Alvani, 2006)

Expert system as a subset of artificial intelligence is trying to mimic human behavior and emulate in solving the problems and the solutions. (Arab Mazar Yazdi & Soleimani & Khaksari, 2010)

Systems that require expert knowledge and a lot of people are not able to do; Experts do these things only it means the people who have acquired the needed knowledge. For example, consider medical diagnostics, electronic design and scientific analysis. Programs that are able to perform these tasks, they are very useful because they often are faced with a lack of experts and professionals. Programs have been written much earlier that performed some of the tasks. These programs are called expert systems and process of making them called knowledge engineering.

3. Expert System Model

An expert system model, consisting of four main sections:

1. Knowledge Base
2. Inference Engine
3. Explanation Facilities
4. User Interface

- Knowledge Base

It is a place where Expert knowledge is stored in encoded and understandable format for the systems.

- Inference Engine

Even when we show the knowledge domain with legislation, again, a qualified person must determine which legislation applies to a particular problem. In addition, it should be clear that this legislation applies to which categories. Similarly, in expert system will need to decide what is legal and which level should be selected for evaluation. Inference devices, is actually the heart of an expert system. A complex system that use rules of inference as a set of “if ... then ...” To find the answer, or a final judgment. Thing that makes expert system, an expert system is method which this rules are processed according to them. Inference devices, to reach judgments can act in two ways, One of the reasoning is that start from data and reached the result. With Considering Information regarding requested subject, starting from (ii) and reached the appropriate results. In other words, in this chain, from introduction, we reach conclusions. The second conclusion is that start from the result and Looking for that certain results or the appropriate initial conditions. In other words, starting point is (then) and from them achieve (if).

The first method is called based on data techniques and the second method is based on goal.

4. Explanation Facilities

It uses to illustrate the conclusions of an expert system for a specific problem with specific facts, into understandable the language for user. This facilities, has the benefit that user with seeing inference process, will have more reliable
the decision taken by system. And an expert knowledge that entered a knowledge base will be sure that his knowledge has entered to the knowledge base correctly.

5. User interface

Purpose of user interface is a set of equipment and software that acts as a channel between the user and the expert system. This means give user the ability of provide the desired information to a system.

A user interface expert system naturally should have a high power to exchange. To structure of exchange information, in the form of interview an applicant and a qualified person will perform (Buchanan, 1988)

What are the benefits of an expert system?

The desirability of an expert system mainly depends on ability to access it, and level of ease to work.

Advantages of expert systems can be sub-classified as:

- Increased accessibility: some experiences are provided by computer, and we can say easier that an expert system is Mass production of experience.
- Reduce the cost: Cost experience for the user, greatly reduced.
- Reduce the risk: Expert systems can use in environments that may be difficult and dangerous for human. • Being persistent: Expert Systems are permanent and stable. In other words, don’t die like humans and they are inseparable.
- Multiple experiences: an expert system can be total experiences and knowledge of many experts.
- Increased reliability: Expert Systems never get sick or tired, do not strike, or not to plot against their manager. But in experts often this situation happens.
- Explanation power: an expert system can explain the route and argument leading to the conclusion. But experts often for various reasons (fatigue, lack of interest, etc.) cannot do this act in decisions making time. This feature increases your confidence about correct decisions making.
- Rapid response: expert systems respond fast and quickly.
- Response in all situations: in an emergency time, is possible for an expert to because of stress or other factors, couldn’t make the right decision. But expert system does not have these disadvantages.
- Experience data base: an expert system can act as an experience database and make available a lot of experiences.
- User training (Intelligent Tutor): an expert system acts as an intelligence tutorial. So that gives some example to expert system and wants the reasoning of it.
- facilitate the transfer of knowledge: One of the main advantages of expert system is easy to transfer to different geographical locations. This knowledge for countries that cannot afford buy knowledge and expertise is very important (Durkin, 1994. Rezaeian, 1999).

6. Applications of Expert Systems:

One of the best fields of expert systems, are accounting and finance fields. Many kinds of expert systems for different applications in the field of human knowledge that has been built using different groups of decision makers companies and organizations, accountants, financial analysts, tax experts and finally general public. Expert systems for selecting a strategic plan, developed with the view that managers to choose a strategic planning are facing with a lot of limitations. Including time, skills, financial resources, expert advisors are etc. (Subramanian , 2002)

Many applications of expert systems in the three fields of accounting, management accounting and tax affairs are as follows:

A) Auditing:

Risk assessment - Auditing program - providing technical assistance - detect fraud, prevent them
B) Accounting management

Pricing of products and services - the cost - accounting system design - Capital Budgeting - Accounting methods - validation - creating and establishing control

C) Tax affairs:

Tax Recommendations - tax accounting differences - Financial analysts and personal financial planning expert systems are now one of the users

During investigating the financial status of a company or specific customer financial analysts beside his interpretation of financial data, control opinion of expert system as an additional expert opinion and in the case that the second judgment objection with his idea tries to take more care in their analysis and change his mind in some cases. (Rezaeian, 2005; Rolli, 2001)

7. Types of Financial Analysis Expert Systems

Because of the financial judgment, virtually every four-step decision-making process of gathering data, perform business analysis and insight about the position, and finally the decision is involved, Expert Systems related to financial analysis, based on help to different procedures of decision making, are divided into three areas:

The three areas are:

1. Insight facilitating
2. Decision facilitating
3. Decision Making

- Insight facilitating Expert Systems

This type of expert system, are the main purpose to provide analysis to assist the analysis of ratios and charts. Stein, ratios and charts for financial analysis in creating more detailed insights about the financial condition and future prospects of the institution, it is useful. With this purpose, actually the first and second stages of the four-step decision-making process perform with the help of this system. The software, called Insight facilitating because their goal is helping brokers. Thus, the degree of skill and expertise are expert systems such applications include:

Insight and NEWVIEWS, both actually are a comprehensive system of accounting including financial analysis; it means do all the accounting operations. In Environments like spreadsheets, presented their financial analysis REFLEX is well-known software which calculates 12 key ratios and also provides analysis and interpretation of the proposed. This analysis, along with ratios, trends and graphs is appropriate (Rich, 2002).

- Expert systems to facilitate decision making

In this type of financial expert systems there are knowledge bases that while financial ratio analysis could also provide insights into the subject of analysis. And this led to the distinction of being the from first batch systems. Therefore, in such systems, the four-step decision-making process is done in three steps. A sample of this expert system is, «ANSWERS» (Durkin, 1994).

8. Conclusions

The importance of expert systems, due to the increasing need of the community to take quick decisions and solutions in complex cases where multiple humane sciences needed is characterized. Expert systems solve the problem that would normally require skill and expertise of human experts. These systems provide human accomplishments for numerous groups. See Fine points and details clearly, investigate the different aspects of assumptions, and provide optimal solutions available for managers to make the best decision to adopt in a particular time. However, the important thing is not to put the items that each system has its limitations and defects, which are the low-life expert systems, perhaps this is due to the benefits that were mentioned is negligible.
References