

Use of Expert Systems to identify the right strategy to be used in organizations

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Abstract- On a technological level, there has been an incredible progress in computer and artificial intelligence over the last few decades, and as a result, we have begun to conduct predictions and provide associated outcomes by computer using the knowledge database stored in this article. With the help of computers and technology, marketing is essential for gaining a competitive advantage. Furthermore, the article analyses the current limits of developing an "intelligent expert system" as a business strategy.

Keywords: intelligent expert system, software agent, marketing, competitive advantage.

1. Introduction

Expert systems are computer systems that help the computers to make decisions based on a pre-requisite knowledge database. For a competitive advantage, marketing plays an important role. Environment changes needs to be monitored and necessary changes are to be made in an organization. An efficient knowledge management system is required to acquire, store and retrieve the knowledge when needed (Moradi *et al.*, 2013). When these systems acquire knowledge from several sources rather than from a single source, such systems are knowledge-based systems (Luconi *et al.*, 1986).

2. Applying intelligent expert systems to make marketing decisions

The term software agent is referred to a set of programs that performs a task for the user with almost nil guidance (Bui *et al.*, 1999). Software agents are automated to perform a task, store the result of a task, and use the results as a learning to perform a new task (Sugumaran *et al.*, 2002). It thus can identify patterns among tasks performed and can predict an outcome. Components of a software agent are:

- a) Autonomy: Lesser human interference required
- b) Social Ability: Enhances Communication
- c) Reactivity: Shows suitable response to environmental changes
- d) Pro-activeness: Based on past results, the present can be determined (Julka *et al.*, 2002)

Previous Expert Systems Built

a> MYCIN: Infectious diseases are diagnosed (Buchanan and Shortliffe, 1984)

- b> XCON: Digital Equipment Corporation's system for configuring computer systems (Kraft *et al.*, 1984)
- c> PROSPECTOR: Evaluates geographical locations for ore deposits (Duda *et al.*, 1979)

Thus, expert systems can be used to capture knowledge and skills to create a competitive advantage.

Issues in the development of an expert system for the key area of Marketing

There has been an increase in the development of expert system in business organizations since the past years (Biswas *et al.*, 1988). Companies prefer expert systems to solve internal problems as these problems are more understood than problems relating to customers and markets (Feigenbaum, 1988). To analyse an expert system one must find out, whether the expert system has the characteristics desirable (Murdock, 1990). The desirable characteristics are Heuristic knowledge obtained through experience should solve the problem in the given area. Problem should be solved with incomplete information (Gabor, 1985; Winkler 1983).

Developing the expert system

a> **Knowledge Acquisition:** Developers of expert system work with experts during the development process and throughout acquire new knowledge and add the knowledge to the developing expert system. Therefore, interaction between the knowledge engineer and the expert is a must.

b> **Knowledge Modelling:** Organising the expertise obtained during knowledge acquisition process into *valid domain model* of the decision making process (Barrett & Beerel, 1988). The coding of the knowledge base is done in the basis of the model.

c> **Knowledge Encoding:** The initial encoding is done straight forward. Then the initial encoding was modified based on the view of the experts.

Expert Systems for sustainable competitive advantage

Expert systems help in Marketing Information Systems. Marketing Information Systems is defined as an interacting structure of people, equipment, methods, and controls, which is designed to create an information flow that is capable of providing an acceptable base for management decisions in marketing (Berenson, 1969). Strategic practitioners and researchers are interested in the increasing use of information technology for formulating strategy and studying its impacts on financial performance (Sabherwal and King, 1991). The strategic impact of such IT based expert systems is huge (Gash, 1992: 2):

- a> Cash Management Account based on an information system expert system that adds up the details of the combined customers' checking, savings, credit card into a single statement which is automated to invest surplus funds to interest - bearing money market.
- b> Retailers like Wal-Mart use sophisticated management which includes electronic data interchange with suppliers to improve and increase operations services' efficiency.

Researchers have analysed the conditions under which ITs create competitive sustainable advantage (Porter, 1985). Porter focused on first mover advantage. He argued that technological advantages arise when first-mover advantages out weight first-mover disadvantages. Knowledge Management Expert Systems are defined as networked systems that share and grasp knowledge throughout the enterprise (Country Monitor, 1998). Porter' value chain analysis argues Information Systems as a support function within the organization.

Improving decision making by using decision support expert system

Decision support systems increase the effectiveness of marketing decision makers (Bruggen, 1998). High-quality decisions are those in which the values of the marketing decision variables are changed such that it leads to profit. Decision makers make use of available information to determine the nature of the relationships between decision variables and profit. According to Dawes (1979), people are bad at integrating information from diverse and incomparable sources, whereas models are good at such integration.

Architecture of an expert system

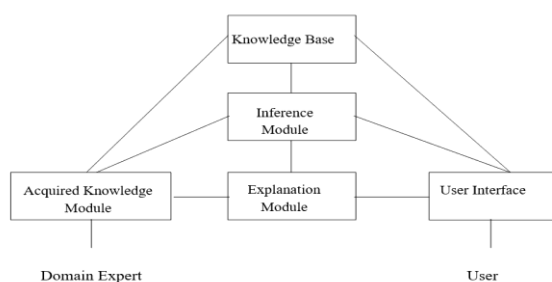


Figure 1: Architecture of an expert system

Advantages of Expert Systems

Can capture and store rare expert knowledge. The stored knowledge can be distributed to among employees to improve employee productivity. Expert systems can deal with complex tasks and activities as well as an extremely database of knowledge. They can be used to imitate human activities. Using Information and Communications Technology, expert systems can transfer expertise to remote locations. Expert system provides consistent answers for similar decisions and tasks and promotes logic behind decision-making.

Limitations of Expert Systems

Decision made is based on prior experience. Therefore, there is a lack of common senses while making decisions. If there are errors in knowledge base, it might lead to wrong strategic decision making. If an error occurs while acquiring knowledge by the expert system, the error would be carried on to the subsequent strategic decisions made. Expert systems won't be able to respond to situations outside their range of expertise. Sometimes the logic undertaken by an expert system to make a strategic decision is not understood by domain experts.

3. Conclusion

Expert systems are used for assistance. Like other tools used in a computer, expert systems are useful in solving business problems but they can be misused. These systems have been programmed by humans and can never replace human intellect and common sense (Stevenson, 1990). Expert systems can help in developing theories by addressing problems within their application domains (Cavusgil and Evirgen, 1997).

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