ISSN: 2394-7659
IMPACT FACTOR- 2.789

International Journal of Engineering Researches and Management Studies

USE OF EXPERT SYSTEM BY THE HUMAN RESOURCE DEPARTMENT OF AN ORGANIZATION

Poonam Verma[*1] & Umesh Gupta[2]

ABSTRACT

Human resource Teams have been important for an organization as they help to recruit the right candidate for the right position. They also record the complete employee data, leave records and salary payrolls. Expert systems used can help in the cumbersome process and help the HR managers to take better decisions and speed up the whole process. In this paper, we have discussed the components of the expert systems and the phases to develop and ideal expert system. We have also discussed the possible challenges faced by the deployment of the expert systems.

KEYWORDS: Artificial Intelligence, Human resource, Expert system, ANN.

1. INTRODUCTION

A decade ago, the tools that can be used by the Human Resource team were email, a rim of paper, clips, telephone and yellow pages to handle the contacts. Like any other field, this field has also not remained untouched from the era of ICT.

Human resources (HR) departments have a generally and common administrative function in all organizations. The HR function consists of the recording about employee data that usually includes personal histories, skills, capabilities, accomplishments and salary. Organizations could formalize the processes of selection, evaluation, and payroll. In order to reduce the manual work from these activities, most companies began to automate these processes by introducing specialized human resource management systems.HR teams can harness the technologies for their benefit.

Various popular tools are given to the HR team nowadays to handle the pressure of the competition in the ever changing market. The world has evolved from the use of ICT tools to AI tools that have infused intelligence into the machines that help the humans to think in a better manner and supply the content required to the managers with convenience at the right time and with ease to use interface tools.

2. ARTIFICIAL INTELLIGENCE & NEURAL NETWORKS

Artificial Intelligence is the buzzword of today and is frequently used to develop tools that can give better convenience to the users. Every industry heavily banks upon the human resource and needs best potential of the industry to work for them. HR teams have earlier been dependent on their wits to decide upon the potential candidates best suitable for their industry. However the scenario has changed today and various AI based tools are available in the market to help them choose the best potential for their required positions.

Artificial Neural Networks are nowadays used to simulate the function of the human brain and we are aware that Human Brain works by a series of interconnected neurons in a similar manner that the human brain may work. However even with the high tech computers, it is estimated that an ANN with 10 million interconnections would have a neuron structure somewhat smaller than a cockroach. (De Lurgio, 1998).

The process of utilizing the ANN for prediction of the right candidate is similar to the function of the multiple regressions.

For a basic time series situation Kuo et al. (1996) found that neural networks produced lower errors than Box-Jenkins and regression procedures. Denton (1995) found ANN to be superior for causal forecasting to regression. There are numerous examples of where ANN's have been used for business forecasting. These include forecasting of electricity consumption (Nizami et al., 1995), airline passengers (Man et al 1995), company audits (Lanard et al (1995), bank failures (Tam, 1992), bankruptcies (Fletcher, 1993), stocks and

ISSN: 2394-7659
IMPACT FACTOR- 2.789

IJERMS

International Journal of Engineering Researches and Management Studies

bonds (Desai, 1998, Li, 1994), futures and financial markets (Meade, 1995, Kaastra et al, 1995, Mangasarian, 1995, Kuan et al, 1995, Grudnitski et al, 1993). In most cases researchers have found that ANN's can produce forecasts with lower overall errors than with conventional methods such as regression.

3. ANN EXPERT SYSTEM:

The expert systems are become a rogue in today's times to deal with various problems and the expert systems basically consists of three basic components where there is a global database , rule interpreter and an inference engine.

A classical production system has three major components:

(1) A Global Database that contains facts or specific knowledge about the problem being solved,
(2) A Rule Base that contains the domain knowledge about the problem domain,
(3) A Rule Interpreter that solves the problem by decoding the rules.

The facts in the global database can be represented in any data structures, such as arrays, or list structures.

In general, the left-hand-side (LHS)is also recognized as the condition part of a rule of any pattern that can be matched against the database. Once a match is made, the right-hand-side (RHS) or action part of the rule can be executed. In general, the action can be any procedure employing the used variables. In particular, it can result in addition of new facts to the database, or modification of old facts in the database.

The rule interpreter has the task of decoding of the rules and implementation of it accordingly. It decides how the condition of a selected rule should be matched to the database, and monitors the problem-solving process. When it is used in an interactive program, it can turn to the user and ask for information (facts) that might permit the application of a rule. The strategy used by the rule interpreter is called the control strategy. The rule interpreter for a classical production system executes rules in a "recognize-act" cycle. Here the rule interpreter cycles through the condition parts of the rules, looking for one that matches the current data base, and executing the associated actions for (some or all) rules that do match.

There are many other ways to control the application of rules, but in all cases the result of executing actions is to change the data base, enabling the application of some rules and disabling others. At this level of generality, production systems are capable of arbitrarily complex behavior. The many ways in which conditions might be matched and variables might be bound, the many factors that might be important for rule selection, and the complicated effects of executing the rule actions can quickly lead to very difficult control problems. As one specific example, in many problem solving systems the application of one rule can invalidate conditions needed for the application of a previously applied rule; to cope with such possibilities, the rule interpreter may have to employ backtracking strategies, or may have to maintain and starch detailed records of the interdependencies between facts in the database.

A frame is an encoding of knowledge about an object, including not only properties (often called. "slots") and values, but pointers to other frames and attached procedures for computing values. The pointers indicate semantic links to other concepts, e.g., brother and also indicate more general concepts from which properties may be inherited and more specialized concepts to which its properties will be manifested. Programming with this mode of representation is sometimes called object-centered programming because knowledge is tied to objects and classes of objects.

Regardless of the particular choice of representation language, a number of issues are important in the construction of knowledge bases for expert systems. In addition the issues of consistency, completeness, robustness and transparency are major design considerations for all systems. For specific problems, it may be essential to represent and reason with temporal relations, spatial models, compound objects, possible worlds, beliefs, and expectations. Consistency in the knowledge base is obviously desirable. In rule-based systems, there are syntactic checks made at the time new, rules are entered to see if there is potential conflict between a new rule and existing rules. For example, two rules with the same premises but with different conclusions may be incompatible if the conclusions are mutually exclusive.

ISSN: 2394-7659
IMPACT FACTOR- 2.789

IJERMS

International Journal of Engineering Researches and Management Studies

Types of Expert Systems:

are basically two types of expert system that are used and they are Fully Loaded System and Expert System Shell.And the basic issues concerned with the expert systems are uniqueness of the HRM decisions , computer hardware, software and expertise with cost feasibility.

Uniqueness of the HRM decisions can be explained as most of the managers or the higher authorities of the company are reluctant to accept the decisions provided by the Expert systems.

Computer hardware, software and expertise challenge is an issue that is not compatible with the different databases, operating system and network protocols.

Cost feasibility is a difficult to be handled, as the expert systems require exponential amount of money to be used in a few years to build an expert systems that can handle the complicated queries of the HR team.

Phases to develop Expert system

Set of steps that are required to be utilized while developing an expert system.

- Is the problem worth to be framed and recognized by an expert system and if yes, then find the required requirements.
- A feasibility test should be conducted for the application and the company.
- Identify domain expert(s).
- Acquire knowledge from domain expert(s).
- Formalize rules into a knowledge base.
- Construct prototype system including ,user interfaces.
- Test prototype with experts; repeating rules 4, 5, 6, and 7 until system is satisfactory.
- Validate expert system.
- Implement expert system.
- Maintain and update system.

4. PROBLEMS OF UTILIZATION OF THE EXPERT SYSTEM:

On the other hand, people with no background in the method seem to be able to make better predictions using ANN's. This sets a dangerous precedent and it is probable the use of ANN's will be over-sold and they will be used in situations where more conventional methods are probably superior. As a result, dangerous conclusions and recommendations will be made by people who use ANN's badly. Notwithstanding this ANN's have been well researched in business fields in recent years

REFERENCES

1. Biggs, S.; Doney, L. D. "Eight HR Expert Systems Now". Computers in Personnel; 1989; Fall: 10-14.
2. Broderick, Renae; Boudreau, John W. "Human Resource Automation for Competitive Advantage: Case Studies of Ten Leaders", working Paper #90-04, Center for Advanced Human Resource studies, School of Industrial and Labor Relations, Cornell university; 1990.
3. Edwards, Alex; Connell, N.A.D. Expert Systems in Accounting. Hemel Hempstead, Hartfordshire: Prentice Hall; 1990.
4. Feigenbaum, Edward A.; McCorduck, Pamela H.; Nil, H. Penny. The Rise of the Expert Company: ~ Visionary Companies are using Artificial Intelligence tQ Achieve Higher Productivity and Projects. New York, NY: Times Books; 1988.
5. Gaines, Brian R. "Knowledge Acquisition Systems for Rapid Prototyping of Expert Systems". INFOR; 1988; 26(4): 256-284.
6. Green, Hugh. "Matching Employees to Jobs: An Expert System Approach". Personnel Management; Sept. 1987; 19(9): 42.
7. Harmon, Paul; Maus, Rex; Morrissey, William. Expert Systems: Tools and Applications. New York: Wiley; 1988.

ISSN: 2394-7659
IMPACT FACTOR- 2.789

8. Kirrane, Dianne E.; Kirrane, Peter R. "Managing by Expert Systems". fiR Magazine; 1990; March: 37-39.
9. Waterman, D. A. A Guide to Expert Systems. Reading, MA: Addison-Wesley; 1986