



Design and Implementation of Knowledge-based Systems in Human Resource

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Abstract: In today's organizations Human Resource is considered as one of the key resources of business organizations. The transaction processing layer of MIS in human resource function deals with routine activities like attendance recording and payroll calculations. The operational level activities also include maintaining the employee records which is used as a basis for strategic layers. With the growing importance of human resource management and increasing size of the organizations, maintenance of employee related data and generating appropriate reports are the crucial aspects of any organization. Therefore more and more organizations are adopting computer based human resource management systems (HRMS). This paper is an attempt to design and implement the knowledge based systems for the business organization and to show how it helps in taking management decisions related to management function especially for the top management.

Keywords: Management Information System, Knowledge Management, Artificial Intelligence, Expert System, Decision Making.

I. INTRODUCTION

Knowledge is the human understanding of a specialized field of interest that has been acquired through study and experience. Knowledge includes perception, skills, training, common sense and experience. Knowledge management is the process of knowledge creation, codification, sharing and how these activities promote learning and innovation (Berkely 2001). The goal of knowledge management is to provide the right knowledge at the right time to the right person. Knowledge management is the set of processes that seeks to change the organization's present pattern of knowledge processing to enhance its outcomes [11].

Systems which provide expert quality advice, diagnosis and recommendations given in real world problems are called an Expert System. Expert systems are means to solve real problems which normally would require a specialized human expert. Building an expert system therefore first involves extracting the relevant knowledge from the human expert. Such knowledge is often heuristic in nature, based on useful 'rules of thumb' rather than absolute certainties. Extracting it from the expert in a way that can be used by a computer is generally a difficult task, requiring its own expertise. A knowledge engineer has the job of extracting this knowledge and building the expert system knowledge base. [1][2]

II. PROBLEM STATEMENT

The researcher has proposed the study on 'A Study of Knowledge-based System in Human Resource' with respect to Birla Corporation Limited. The selected organization is of a large scale in terms of size, area and manpower requirement. After preliminary study it was felt to develop an advanced information management system for various functionalities specifically maintaining attendance by computerized methods and generating management information reports for top management and middle level management.

III. LITERATURE REVIEW

T. Lucey in the book entitled 'Management Information Systems' defines MIS as a system to convert data from internal and external sources into information and to communicate that information in an appropriate form to managers at all levels in all functions to enable them to make timely and effective decisions for planning, directing and controlling the activities for which they are responsible. [5]

Barry E. Cushing in the book entitled 'Accounting Information Systems and Business Organizations' suggests the definition of MIS as a set of human and capital resources within an organization which is responsible for the collection and processing of data to produce information which is useful to all levels of management in planning and controlling the activities of the organization. [5]

The Management Information System (MIS) has evolved as an important tool and technique in business management area in the current opportunities and business threats. Right information at right time in right format will decide the managements' Human resource decisions. MIS is one of the important functions of management. In the 21st century the organizations need the information which is accurate, timely and reliable. The MIS plays an important role in providing the information required for crucial decision making which affects directly to the performance of the organization. [8] [11]

The DENDRAL the first knowledge based AI Application that imitated scientific methods. In 1970s AI applications were developed with goal more useful to people. PROLOG was developed in 1972 and MYCIN the first rule based expert system, demonstrating the power of rule based systems for knowledge representation and inference in medical diagnosis and therapy profession.

CLUES (Countrywide's Loan Underwriting Expert System) have about 400 rules. Countrywide tested the system by having every loan application handled by human underwriter fed to CLUES. The system was refined until it agreed with the underwriter in 95% of the cases.

The Expert system started wide applications in decision making application areas and banking sector is an important

sector in which the expert system can be used and developed. [13][14]

IV. KNOWLEDGE BASED SYSTEMS OVERVIEW

The initial concept of MIS was to process data from the organization and presents it in the form of reports at regular intervals. The system was largely capable of handling the data from collection to processing. It was more impersonal, requiring each individual to pick and choose the processed data and use it for his requirements. The MIS differs since the people in two organizations involved in the same business. The MIS is for the people in the organization. The MIS model may be the same but it differs greatly in the contents.

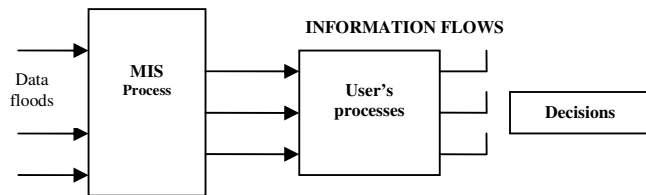


Figure 1: MIS and Decision Making Process

The MIS, therefore, is a dynamic concept subject to change, time and again, with a change in the business management process. It continuously interacts with the internal and the external environment of the business and provides a corrective mechanism in the system so that the change needs of information are with effectively. [12]

MIS has been understood and described in a number of ways. It is also popularly known as the Information System, the Information and Decision System, the Computer-based Information System. The MIS has more than one definition, some of which are given below:

1. The MIS is defined as a system which provides information support for decision making in the organization.
2. The MIS is defined as an integrated system of man and machine for providing the information to support the operations, the management and the decision making function in the organization.
3. The MIS is defined as a system based on the database of the organization evolved for the purpose of providing information to the people in the organization.
4. The MIS is defined as a Computer based Information System.

Thought there are a number of definitions, all of them converge on one single point, i.e., the MIS is a system to support the decision making function in the organization. [12]

The MIS is defined as an integrated system of man and machine for providing the information to support the operations, the management, and the decision-making function in the organization. The above definition emphasizes an association between MIS and decision-making. Application software that processes data, which is not used for decision-making, cannot be called an MIS. For instance, a computer-aided design system is not an MIS.

An MIS deals with information that is systematically and routinely collected in accordance with a well-defined set of

rules. In other words, data collection is a planned activity for which resources are allocated and rules are defined. [8]

Expert Systems are Software packages that attempt to encode the knowledge and decision rules of human specialists so that the package used can call on this expertise in making own decision.

Expert systems are a type of decision Support Systems and represent an application from the field of Artificial Intelligence. Artificial Intelligence is branch of Computer Science concerned with the manipulation of symbols rather than data. Expert System is knowledge based Computer System that behaves like a human expert in some useful way. [3][4][5]

V. SYSTEM DESIGNED FOR ATTENDANCE CAPTURING & RECORDING SYSTEM

The main objective of Attendance Recording System (ARS) is to ensure that the attendance (i.e. presence or absence) of employees is accurately recorded and reported for computation of payable days, overtime hours, festival allowances and payable ESI contributions etc.

A. Responsibilities

Following are the responsibilities assigned at various levels in the organization-

1. Employing Activity's Responsibilities
2. Approving official's Responsibility
3. Timekeeping Responsibilities

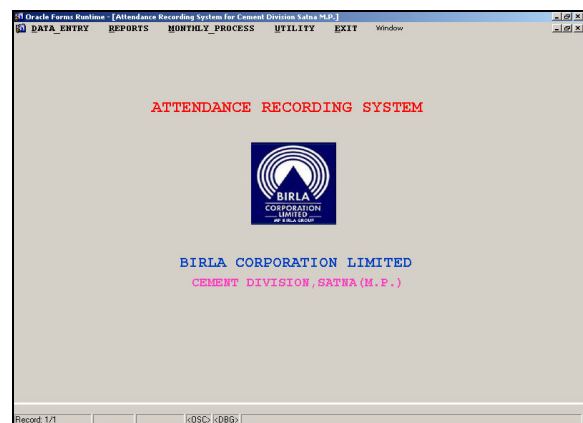


Figure 2: MIS Designed for Attendance Capturing & Recording System.

An efficient employee Attendance Recording system makes for a smoother-running organization. The ARS can contribute to an organization's overall harmony and efficiency. [1] This automated system saves time for managers and employees, improving their productivity. By eliminating manual record keeping, it reduces errors, avoiding disputes. ARS integrates a company's accrual policies and consistent awarding of employee attendance. The primary goals of ARS are to:

1. Establish an efficient workflow process for attendance authorization.
2. Integrate time and leave data with HR, payroll and ERP systems, or to APIs for electronic processing.

3. Ensure accurate and consistent implementation of pay and leave policies.
4. Quickly and simply request leave or other scheduled absences.
5. Receive automatic notification of leave balances, as well as available vacation and personal time, sick days and other leave benefits.

The proposed system has several advantages like worker's individual information is stored separately, searching of particular information became faster, Generation of various reports made review process easy, facilities of full database backup and central control of user, well-defined authorization and security levels etc.

B. Decision Making at Top Level

A decision is basically resource allocation process that is irreversible except that a fresh decision may reverse it or it may overrule the earlier one. A decision is a reasoned choice among alternatives. The decision maker having authority over the resources being allocated makes a decision. The decision can be of various types like simple decision in which there is only one decision is to be made with many alternatives, decision may be goal oriented; decision may be strategic or tactical. The decision capacity involves intelligence, design, choice and implementation of decision maker.

The MIS designed in the study for Attendance Capturing & Recording for Birla Corporation Limited mainly generates the reports like Daily Attendance, Monthly Attendance and Sick Report etc. on which the top management by receiving these reports analyses and the decisions regarding shifting the priority of the job, observing the performance and corrective measures are taken.

C. Reporting from the Designed MIS

The reports which are used by top management are generated from the above MIS like Monthly Attendance, Card Replacement, Sick Report, and Monthly Voucher Correction which are submitted to HR Manager and he takes proper decisions related with Attendance Capturing & Recording.

VI. CONCLUSION

The paper entitled 'A Study of Knowledge-based System in Human Resource' gives an impact on the important function of

top management. It is also used to generate the reports with the help of advanced technology having maximum characteristics of good information by which the decisions are to be taken related with the functionality of management decisions. The Expert System developed specifically helps HR managers to keep the control on working of the staff at various levels.

VII. ACKNOWLEDGEMENTS

The author acknowledges gratitude to Birla Corporation Limited for providing the support for this study without their cooperation it is difficult to develop the MIS model.

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