Human Resource Information System for Recruitment Drive Using Fuzzy Logic

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Abstract— Nowadays, in HRM field, among the challenges of HR professionals are organization's talent, especially to ensure the right person for the right job at the right time. It is a continuous process that involves sourcing, hiring, developing, retaining and promoting them while meeting the organization's requirements simultaneously. These tasks involve a lot of managerial decision, which is sometime very uncertain and difficult to make an appropriate decision. This paper is an attempt to design a knowledge based systems for recruitment drive using Fuzzy Logic. Knowledge discovery techniques plays vital role in talent forecasting. In talent management, to identify the existing talent is one of the top HR management challenges. This challenge can be manage by using Data Mining technique in order to predict the suitable talent based on their performance.

Keywords— *KDT, KDD, HRIS, Talent Forecasting, Fuzzy Logic*

I. INTRODUCTION

Human Resource (HR) department in an organization doing numerous exercises where one of the important activity is to keep up with the proficient and keen human resources for the association. HR applications can be utilized to give reasonable and predictable choices, and to work on the adequacy of dynamic cycles. Other than that, among the challenge for HR professionals is to manage organization talents, especially to ensure the right person for the right job at the right time. Generally the selection procedure involves interview/ group discussion to understand the soundness and the reactions of the candidates on a particular situation.
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II. KDD PROCESS

Data mining refers to *extracting or "mining" knowledge from large amounts of data*. The term is actually a misnomer. Remember that the mining of gold from rocks or sand is referred to as *gold* mining rather than rock or sand mining. Thus, data mining should have been more appropriately named "knowledge mining from data," which is unfortunately somewhat long. "Knowledge mining," a shorter term may not reflect the emphasis on mining from large amounts of data. Nevertheless, mining is a vivid term characterizing the process that finds a small set of precious nuggets from a great deal of raw material. Thus, such a misnomer that carries both "data" and "mining" became a popular choice. Many other terms carry a similar or slightly different meaning to data mining, such as knowledge mining from data, knowledge extraction, data/pattern analysis, data archaeology, and data dredging. Many people treat data mining as a synonym for another popularly used term, Knowledge Discovery from Data, or KDD. Alternatively, others view data mining as simply an essential step in the process of knowledge discovery. Knowledge discovery consists of an iterative sequence of the following steps:
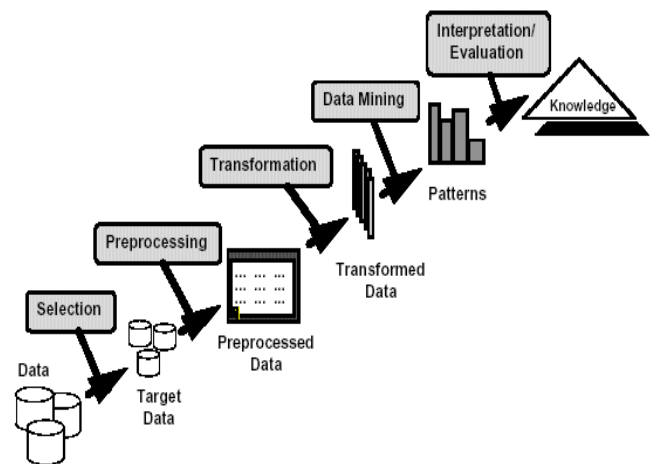

Fig.1 KDD Process

1. **Data cleaning** (to remove noise and inconsistent data)
2. **Data integration** (where multiple data sources may be combined)
3. **Data selection** (where data relevant to the analysis task are retrieved from the database)
4. **Data transformation** (where data are transformed or consolidated into forms appropriate for mining by performing summary or aggregation operations, for instance)
5. **Data mining** (an essential process where intelligent methods are applied in order to extract data patterns)

6. **Pattern evaluation** (to identify the truly interesting patterns representing knowledge based on some interestingness measures)
7. **Knowledge presentation** (where visualization and knowledge representation techniques are used to present the mined knowledge to the user)

III. RELATED WORK

Anitha Mary Florence and Ms. Savithri et.al in [1] describes an approach which ensures talent knowledge acquisition by using employee's performance records. This has been done by identifying talent patterns from existing data in HR databases as useful and valuable knowledge. The study ensures talent knowledge acquisition by using employee's performance records. This has been done by identifying talent patterns from existing data in HR databases as useful and valuable knowledge.

Anitha Mary Florence and Ms. Savithri et.al in [8] describes the potential classification techniques for academic talent forecasting in higher education institutions. The study attempts to determine the potential classification techniques for academic talent forecasting in higher education institutions. Hamidah Jantan, Abdul Razak Hamdan and Zulaiha Ali Othman et.al in [9] describes the Potential HR System architecture for talent forecasting by using KDD.

Jayanthi Ranjan, D.P. Goyal, and S. I. Ahson et.al in [10] describes the role of data mining in Human Resource Management Systems (HRMS). A deep understanding of the knowledge hidden in Human Resource (HR) data is vital to a firm's competitive position and organizational decision making. Analyzing the patterns and relationships in HR data is quite rare. The HR data is usually treated to answer queries because HR data primarily concerns transactional processing.
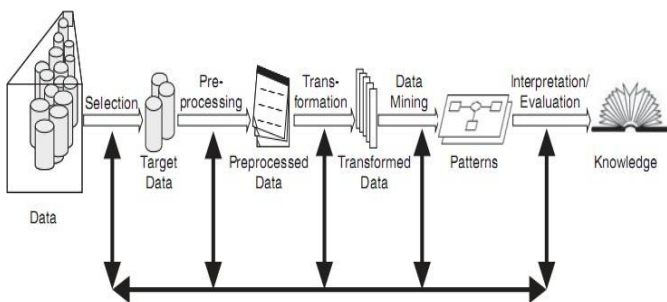

Fig 2: A summary of the stages that make up the knowledge discovery in databases (KDD) process (Fayyad et al., 1996b)

It is necessary for HRMS to become more concerned with the quantifiable data. We show how data mining discovers and extracts useful patterns from this large data set to find observable patterns in HR. The study demonstrates the ability of data mining in improving the quality of the decision-making process in HRMS and gives propositions regarding whether data-mining capabilities should lead to increased performance to sustain competitive advantage.

Shu-hsien Liao et.al in [15] attempts knowledge management (KM) development classifies KM technologies using the seven categories as: KM framework, knowledge-based systems, data mining, information and communication technology, artificial intelligence/expert systems, database technology, and modelling, together with their applications for different research and problem domains. Some discussion is presented, indicating future development for knowledge management technologies and applications as the followings: (i) KM technologies tend to develop towards expert orientation and KM applications development is a problem-oriented domain. (ii) Different social studies methodologies, such as statistical method, are suggested to implement in KM as another kind of technology. (iii) Integration of qualitative and quantitative methods and integration of KM technologies. (iv) The ability to continually change and obtain new understanding is the power of KM technologies and will be the application of future works.

IV. OBJECTIVES OF THE STUDY

The objectives of my study are as follows:

*   To study various Knowledge Discovery Techniques (KDT) available for talent forecasting in HR application.
*   To study various factors affecting in forecasting HR applications.
*   To design knowledge discovery techniques for talent forecasting in HR application.

V. HRIS FOR RECRUITMENT DRIVE USING FUZZY LOGIC

To make more effective recruitment / selection procedure from the tons of applications, finding suitable candidate for the right position who best fit in the organization, a three tier prototype has been proposed using fuzzy logic. In order to keep up with technological improvement and changes, selecting the right person for the right position is very important. Many large-scale companies have professional HR departments to deal with this problem. In the proposed system, following steps should take place:

*   The job agency advertises the job vacancy for applicants to apply.
*   Human Resource Manager sets all requirements for the job available.
*   Applicants data is entered into the *proposed* system (Online Portal)
*   When a match is found, applicants are short listed and email or SMS is sent to the applicant(s) to come to appear for three (3) tests (that is aptitude, computer proficiency and personality).

- Ranked applicants who are suitable then proceed for interview
- Applicants are accepted or rejected depending on the type of attitude, presentation, communication skills and confidence level.

The Algorithm

Start

1. Receive job applications
2. Organize data of individual applicants
3. Upon requisition for a position, choose appropriate method to shortlist:
    - Obtain parameters or attributes from requisition as shown in following table
    - Rank the candidates based on attributes and preferences.

If candidate is short listed inform him / her to be appearing for the test.

4. The candidate should be appearing in test where each criterion will be evaluated using fuzzy rules.
5. Accept input from test results
6. Evaluate the results of the test using fuzzy logic method.

Candidates are recommended to employers for oral interview and are interviewed based on the factors Language Ability, Personality, Presence of Mind and Confidence Level etc.

8. Collect Scores given by interview panellist.
9. Communicate decision to selected candidates based on ranking and interview performance by sending email to the candidate.
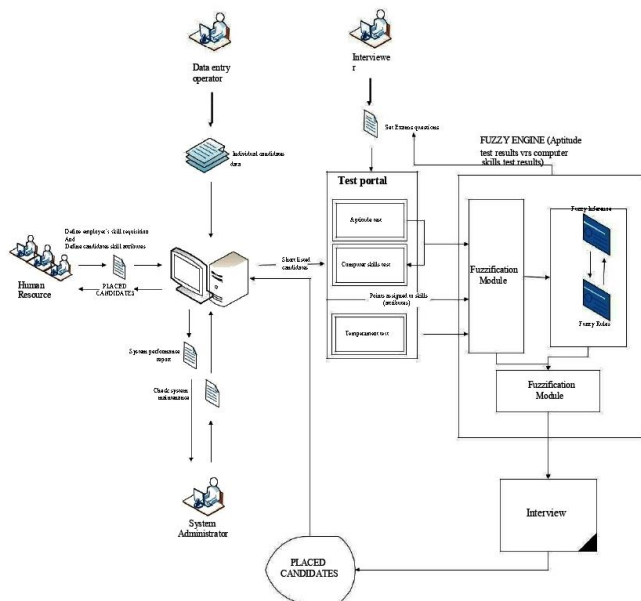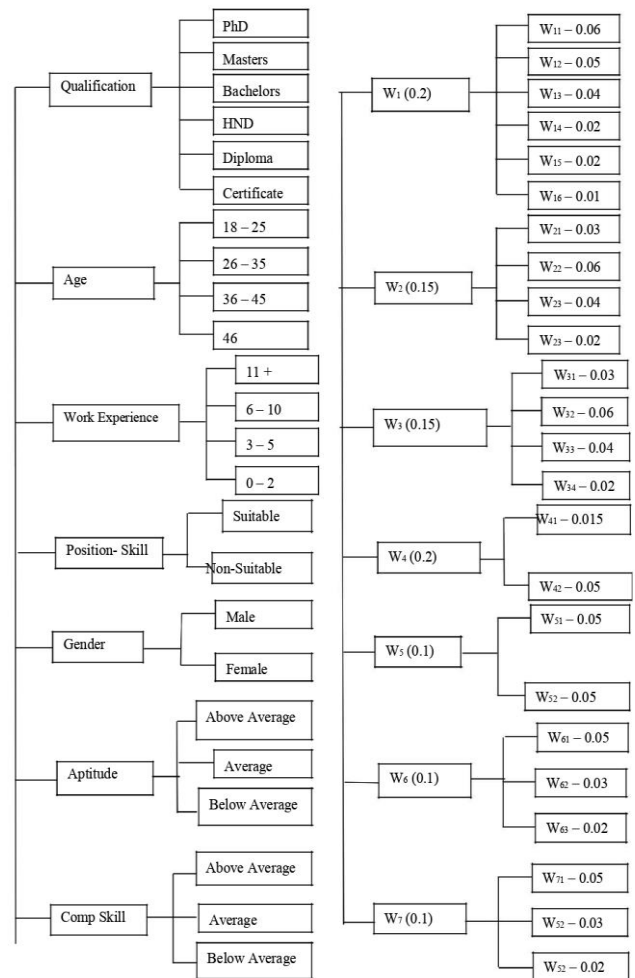
Stop

Fig 3: System Model

Fig 4: weight associated with each parameter and its sub-parameter

The score of each candidate will be helpful to identify best suitable candidates for the specific roles.
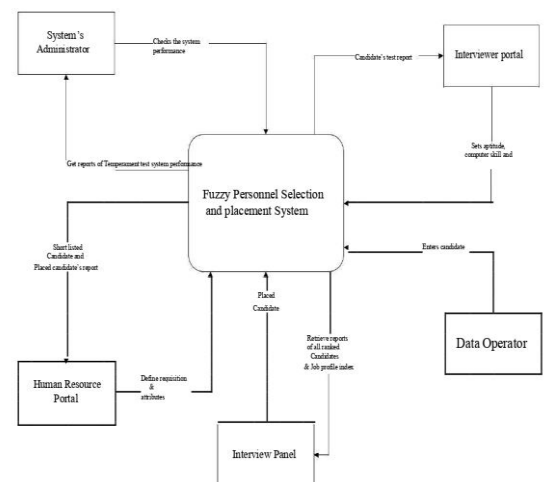

Fig 5: Context Level Diagram

VI. Conclusions

The Knowledge Discovery Techniques are very useful in forecasting HR applications as these are very important for finding useful information and patterns of data. In this study, we attempt to use this approach to handle the issue in managing talent i.e. to identify existing talent by predicting their performance using the past experience knowledge. Knowledge Discovery Database (KDD) is the automatic extraction of non-obvious hidden knowledge from large volumes of data.

VII. Scope of the Study

Human Resource (HR) applications can be used to provide fair and consistent decisions, and to improve the effectiveness of decision making processes. Besides that, among the challenge for HR professionals is to manage organization talents, especially to ensure the right person for the right job at the right time. For that reason, this study is an attempt to evaluate the knowledge discovery techniques for forecasting HR applications.

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