

A Study on Computerized Employee Recruitment Performance Evaluation and Turnover Prediction Using Data Mining Techniques

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Abstract- *A employee performance appraisal is regarded as one of the tools of human resources performance management. People, their knowledge and skills are currently considered to be the most valuable resource a company has. The article focuses on methods of employee performance appraisal in many organizations around the world. Recruitment is the process of having the person, in the right place, at the right time and it is crucial to organizational performance. Finding and hiring the best qualified candidate for a job opening, in a timely and cost effective manner. The recruitment process includes analyzing the requirements of a job, attracting employees to that job, screening and selecting applicants, hiring, and integrating the new employee to the organization. In existing system HR team hiring employees based on their experiences and previous knowledge .our proposed system tells about the employee hiring, evaluating performance and turnover prediction everything is computerized. With this we can decrease the spending time for recruitment process. We can evaluate the performance using personality traits from the experienced persons. And we can predicate the employee turnover using classification techniques. There are different types of data mining tools and methods based on their accuracy, calculation time and user friendliness. Data mining techniques are used to find the hidden information and relation between large amounts of data*

.this can be done by processing of the employees database by using data mining methods. appraisal counseling whereby the appraisal outcomes are analyzed to explain strengths and weaknesses and set agenda for better future performance.

Keywords: Performance evaluations, Turnover prediction, Hiring process prediction, internal comm. prediction, Data mining techniques, J48 Algorithm,

1. INTRODUCTION

A employee performance appraisal is regarded as one of the tools of human resources performance management. People, their knowledge and skills are currently considered to be the most valuable resource a company has. The article focuses on methods of employee performance appraisal in many organizations around the world. The first part of the article deals with the theoretical background of the term “formal appraisal” and employee performance appraisal methods as defined by specialists. Further, the article describes, based on a questionnaire survey, employee performance appraisal methods that are considered important for the organizations. The aim of the article is to identify the current state of formal employee appraisal in a sample group of agricultural organizations and to test dependencies between selected qualitative characteristics. The outcomes show that the most commonly used methods of employee performance appraisal in organizations include predefined goal based performance appraisal, predefined standard outcome-based performance appraisal and appraisal interviews. Many organizations apply these methods in particular due to the fact that their findings are further utilized in other areas of human resource management, such as reward system and personnel planning. In statistical terms, dependency between the method of employee performance appraisal according to predefined goals applied by organizations and personnel planning Performance appraisal has increasingly become part of a more strategic approach to integrating HR activities and business policies and may now be seen as a generic term covering a variety of activities through which organizations seek to assess employees and develop their competence, enhance performance and distribute rewards which may be defined as any effort concerned with enriching attitudes, experiences, and skills that improves the effectiveness of employees.[1] Organizational performance

and its resultant efficiency and effectiveness can only be achieved when individuals are continuously appraised and evaluated. The inability of organization to install an effective performance appraisal strategy has hindered them from achieving competitive advantage which they require more now than ever before. Appraisal processes are not systematic and regular and often characterized by personal influences occasioned by organizations preoccupation to use confidential appraisal system which hinders objectivity and fairness. Often organizations ignore management by objectives, critical incidents to personal prejudices. This is retrogressive as it affects the overall performance of the individual. appraisal counseling whereby the appraisal outcomes are analyzed to explain strengths and weaknesses and set agenda for better future performance. Organizations should stop giving less attention to the evaluation of their employees and recognize that organizational training needs can only be identified from performance appraisal outcomes. It is an invaluable tool but in the hands of human resource management officers to continuously evaluates and audits the performance of its employees in other to help organizations win competitive advantage.

2. Preformation evaluation

The ability to predict a employee's performance is very important in industrial Sector. Employee's performance is based upon diverse factors like personal, social, skills, punctuality, dependability, Interpersonal relation, task/responsibility, Work standard, actual performance, Psychological and other environmental variables. Data Mining is a tool which can be used to accomplish the objectives. Data mining techniques are used to discover hidden information patterns and relationships of large amount of data, which is very much helpful in decision making. A single data contains a lot of information. The type of information is produced by the data and it decides the processing method of data. A lot of data that can produce valuable information, in industrial sector contains this valuable information. The performance of employee is calculated, to know them well, the best way is by using valid management and processing of the employees' database.[2][3]

3. Turnover Prediction

Training and adaption of employees are time and money consuming. Employees' turnover can be predicted by their organizational and personal historical data in order to reduce probable loss of organizations. Prediction methods are highly related to human resource management to obtain patterns by historical data. This article implements

knowledge discovery steps on real data of a manufacturing plant. We consider many characteristics of employees such as age, technical skills and work experience. Different data mining methods are compared based on their accuracy, calculation time and user friendliness. Furthermore the importance of data features is measured by Pearson Chi-Square test. In order to reach the desired user friendliness, a graphical user interface is designed specifically for the case study to handle knowledge discovery life cycle. Turnover may eventuate to positive results like functional turnover or to negative results like dysfunctional turnover. Functional turnover means that employees with poor performance quit their jobs and employees with good performance remain in their jobs. In turn, dysfunctional turnover means that employees with good performance quit their jobs and employees with poor performance stay in their jobs.

4. Employee Hiring

The business organizations are always on a look out for suitable employees. There are two types of recruitments, one which involve recruiting the experienced people and second one is the recruitment of the freshers. The freshers are considered as an investment for the future. This paper is prepared to find out and explain how the companies hire the freshers and how they work on them to prepare them for the future challenges and to develop their skills and competencies. This paper [5]attempts to explain in detail how the management, communication, entrepreneurial and competitive skills are developed in the freshers There are many areas which adapted this approach to solve their problems such as in finance, medical, marketing, stock, telecommunication, manufacturing, health care, customer relationship and etc. However, the data mining application has not attracted much attention from people in Human Resource (HR) field. Besides that, in our previous study, most of the prediction applications are used to predict Stock, demand, rate, risk, event and others; but there are quite limited studies on human prediction. In addition prediction applications are mainly developed in business and industrious fields; and quite restricted studies involved human talent in an organization.[4] HR data can provide a rich resource for knowledge discovery and for decision support system development.

5. Evaluation Of Employee Internal Communications

This paper is concerned with the problem of Evaluation Of Employee Internal Communications from text. Recently, with the fast development more and more documents are assigned by employees with emotion labels such as happiness, sadness, and surprise. Such emotions can

provide a new aspect for document categorization, and therefore help online users to select related documents based on their emotional preferences. Useful as it is, the ratio with manual emotion labels is still very tiny comparing to the huge amount of web enterprise documents. In this paper[1], we aim to discover the connections between social emotions and affective terms and based on which predict the social emotion from text content automatically. More specifically, we propose a joint emotion-topic model by augmenting Latent Dirichlet Allocation with an additional layer for emotion modeling. It first generates a set of latent topics from emotions, followed by generating affective terms from each topic. Experimental results on an online news collection show that the proposed model can effectively identify meaningful latent topics for each emotion. Evaluation on emotion prediction further verifies the effectiveness of the proposed model.

5.1 K-Means Algorithm

Algorithmic steps for k-means clustering

Let $X = \{x_1, x_2, x_3, \dots, x_n\}$ be the set of data points and $V = \{v_1, v_2, \dots, v_c\}$ be the set of centers.

- 1) Randomly select 'c' cluster centers.
- 2) Calculate the distance between each data point and cluster centers.
- 3) Assign the data point to the cluster center whose distance from the cluster center is minimum of all the cluster centers..
- 4) Recalculate the new cluster center using:

$$v_i = (1/c_i) \sum_{j=1}^{c_i} x_j$$

where, 'c_i' represents the number of data points in ⁱth cluster.

- 5) Recalculate the distance between each data point and new obtained cluster centers.
- 6) If no data point was reassigned then stop, otherwise repeat from step 3).

5.2 C4.5 Algorithm

Algorithm 1.1 C4.5(D)

Input: an attribute-valued dataset D

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1: Tree = {}
2: if D is "pure" OR other stopping criteria met then
3:   terminate
4: end if
5: for all attribute a ∈ D do
6:   Compute information-theoretic criteria if we split on a
7: end for
8: abest = Best attribute according to above computed criteria
9: Tree = Create a decision node that tests abest in the root
10: Dv = Induced sub-datasets from D based on abest
11: for all Dv do
12:   Treev = C4.5(Dv)
13:   Attach Treev to the corresponding branch of Tree
14: end for
15: return Tree
  
```

6. Current Limitations

The current design of The organizations hire different kind employees as per the requirement of the job they are hired for . these new employees can be well experienced once or they can be fresh graduates. There are two ways of hiring employees the fresher's can be hired from the campus placements being organized by various educational institutions. When the organization recruiting employees the HR team will consider the competency during interview. The competencies are a mixture of knowledge, skills and attitude that can provide a clear description about a candidate.fo all this the HR team is spending lot of time to hiring employees. If they are freshers again the organization spending time for training .after hiring if they are not performing well again they are going for selection.

7. Proposed System

In our proposed system the recruitment process is completely computerized. Using this approach we can decrease the spending time for HR management.in this approach we can use ten personality traits as database .those personality traits are matched with the candidate traits he will selected for organization. And also proposed system includes the performance evaluation technique; with this we can predicate the employee turnover for the year. This project is fully computerized so we can recruit as many employees with in short period of time.

8. CONCLUSION

We proposed It was observed that compared with manual recruitment the computerized hiring is very efficient. Sources of recruitment more. Deciding factors in employee selection. Opinion on induction Registration with online employment agencies. Time management and performance

evaluation. Useful for large organizations. Turnover prediction. data mining techniques applied to the different problem domains in HR field of research in order to broaden our horizon of academic and practice work on data mining in HR. In addition, C4.5 classifier algorithm is the potential classifier in this experiment. Thus, this technique can be used for real human talent data in the next prediction phase i.e classification rules construction. These generated classification rules can be used to predict the potential talent for the specific task in an organization. the paper, it can be concluded that the companies treat the freshers as an investment for the future. They are not hired in competition to the existing employees. These freshers can be hired directly from the educational institutions and business schools or through an advertisement in the newspaper or on the internet. The freshers are given proper training for developing their analytical skills, knowledge, communication abilities, entrepreneurial skills and market orientation. This way they will become more competitive and confident. This study uses an industrial plant human resource management data in order to extract turnover pattern among employees. Integration between human resource management and DM will improve recruitment and decision making process. Based on the prediction model and association rule model, it is shown that turnover is predictable and by using DM, the management can rely on it as a DSS for human resource recruitment. Revised recruitment process can filter unstable staff in long term and make organization stable. Using this research; the Industry superiors will have the ability to predict the employee's performance. A current performance evaluation is required to support recommendations for merit salary adjustments and in-grade or grade change salary increases. This also helps the supervisor to find the employee's performance and those employees needed special attention for reducing falling ratio for taking action at right time. Decision Tree method is used on Employee's database to predict the Employee's performance on the basis of previous year database.

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