International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 15
May 2018

Assessment of Resume through Predictive Analytics

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Abstract:

Human resource predictive analytics is an emerging application field of analytics for Human Resource Management purposes. The paper sheds light on a novel technique that evaluates the resume by processing big data and generating remarks and score of the Resume. The aim of this research paper is to develop an algorithmic approach to measure candidate's past performance and engagement, analyze employee salary and modeling employee lifetime value for the organization. The paper discusses easy ways to grasp the big data associated with resume. The resume assessment technique can be used for organizations through decision making based on big data collection and predictive algorithm. The paper first discusses the concept of HR predictive analytics for HRM and then an algorithm using Ms-excel and R Programming.

Keywords

Predictive Analytics, Talent Analytics, HR Analytics, Human Resource Management, Modeling, Decision Making, R Programming, CSV files.

1. Introduction

HR analytics is a multidisciplinary approach to integrate methodology for improving the quality of people-related decisions in order to gear up individual and organizational performance in totality. The interchangeable terms used for HR analytics are talent analytics, people analytics, and workforce analytics. HR analytics plays a pivotal role in every aspect of the HR function, including recruiting, training and development, succession planning, retention, engagement, compensation, and benefits. HR analytics are those that involve 'high-end' predictive modeling where rule based what-if scenario setting predict the consequences of changing rules, policies and conditions of an organization.

Traditional HR analytics focuses on the items such as turnover and cost per hire. But most organizations lack a reliable and general view of the workforce and thus need HR analytics to perform workforce optimization and hence it became vital for HR to build up IT and finance analytical skills and capabilities to produce improved Return on Investment (ROI). HRPA generate insights that is very hard to achieve through traditional benchmarking. HRPA is practical and fact-based decision system. Three noteworthy changes that have really created a hunger for predictive analytics in HR are: 1) Enhancement in computing power and its affordability 2) HR big data digitally accessible for processing via cloud storage 3) Global talent war to guard and chase talent streams. [4]

Predictive analytics is regarding data-derived insights that induce better decisions. It makes use of statistical techniques, machine learning methods, and data mining models. These techniques analyze and extract existing and historical facts to make predictions. Predictive analytics have led to prescriptive analytics where HR gets decision options to optimize performance and reshape entire HRM decision making. There are opportunities for HRPA in HRM to expand due to necessary boost provided to enhance HR functions, to better business outcomes and to improve ROI.[1] [4]

The paper focuses on Resume screening because analysing a Resume by a HR manager is a tedious job. Lakh of candidates appear in an interview and employing a HR staff just to read, screen the resume and select the candidate for an interview is a time consuming and costly job. The paper sheds light on a novel technique to screen the resume by processing Big Data and generating remarks and score on the Resume.

2. Aspect of HRPA

2.1 Need of HRPA

Organizations struggle to employ the right people in the right place at the right time by means of analytics. The following reasons support need of HRPA.

a) *Need to remain commercially relevant* : HRM needs to provide senior executives with a predictive analytics based justification for important talent related decisions.
b) *One model cannot cater to all HR issues*: No organization is the same in terms of workforce, talent, environment, strategies, and market

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type. Therefore, one fixed model cannot be applied to any function of HR.

c) *Unique decision policies*: Only past data of the particular organization or its identical culture have ability to provide right decision for HRM. Thus HRPA becomes essential for industries which long for bringing unique decision policies.

d) *Insight needed frequently*: The HR requires skills of technology and management both where technology is not limited to analytics. HR should be able to create insights into data and produce predictive models that optimize the organizational performance.

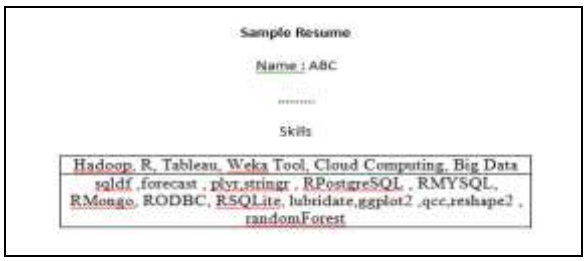
Advent of advance machine learning programs and HR expert systems has provided a cushion to attain organizational objectives of human capital management (HCM), workforce planning, employee management, and performance management.

2.2 Predictive Modeling

Predictive model combines analytical algorithms and provide results in form of a value or scores based on which decisions are taken. HCM: 21 Model [3] is one such predictive model proposed for HRM strategies inspired from Dr. Jac Fitz-Enz which states four stages of HRM, 1.Scan 2.Plan 3.Produce 4.Predict and HRPA applies the same.

3. Big Data Processing

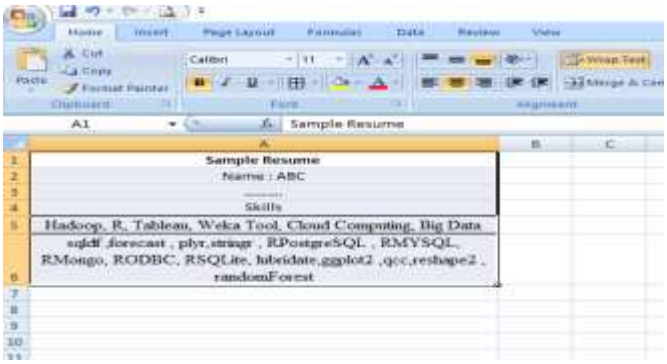
The Big Data has emerged as a significant area of study for both practitioners and researchers. Big Data is a term for massive data sets with large structure. The Resume is a MS-Word file which can be treated as big data. It can be converted into Ms-Excel and finally into a CSV file (comma separated file) which can be used as a structured data and passed as a parameter into a program.The words of resume can be treated as an entity which can be used as a value.



Sample Resume
Figure 3.1

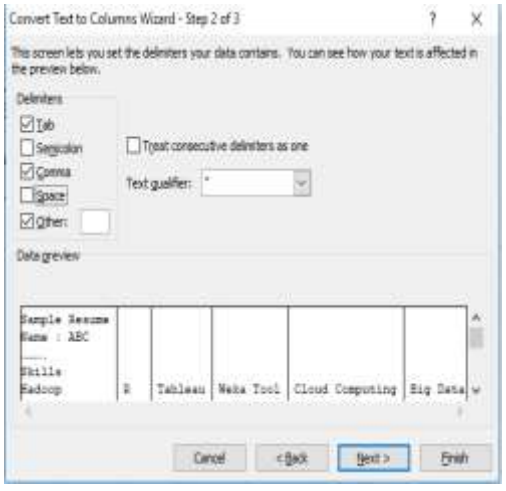
4. Data conversion into Excel

The Ms-Word file is pasted in Ms-Excel. The text is converted into cells using DATA TAB and **Text To Column** feature. The Excel file is saved as CSV file (comma separated file).



Step 1: Copying Ms-Word file in MS-Excel
Figure 4.1

Step 2: Applying Data Tab > Text to Column
Figure 4.2



Step 3: Applying Data Tab > Text to Column with comma as a separator
Figure 4.3

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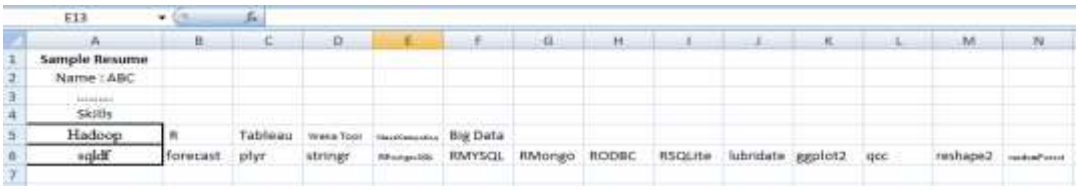
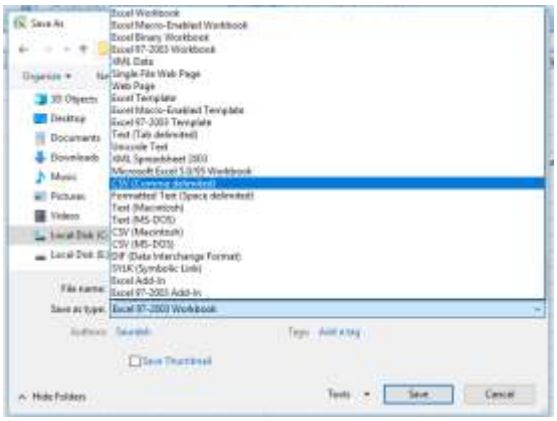
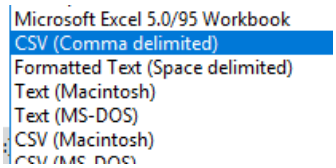


Result: The keywords are separated and stored in a separate cell.
Figure 4.4



Step 4: The file is saved as .CSV file
Figure 4.5



'Zoom In' picture of step 5: The file is saved as .CSV file
Figure 4.6

5. Assigning Weights to Keywords

Each keyword associated with a job profile can be given a weight. For example, if the HR Manager is looking for a Data Scientist, he will look for 'Certification in Hadoop', Knowledge of R Programming etc. Thus weights are assigned for the technical skills the HR manager is looking for. Consider the example, job profile for a Data Scientist.

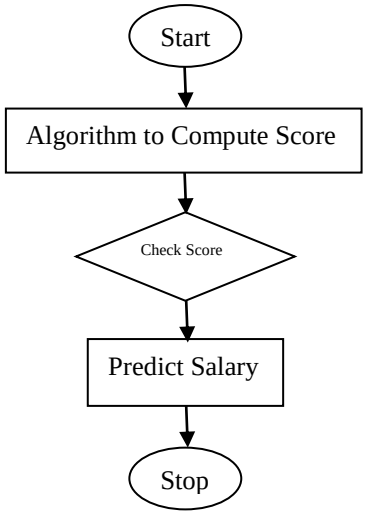
Table 5.1:Weights assigned to keywords

Srl.	Keyword	Weight
1.	Hadoop, R, Tableau, Weka Tool, Cloud Computing, Big Data	10
2.	sqldf ,forecast, plyr,stringr, RPostgreSQL, RMYSQL, RMongo, RODBC, RSQLite, lubridate, ggplot2, qcc, reshape2, randomForest	9.5
3.	MCA, M.Sc., Experience	7
4.	Diploma in Data Analytics	5
5.	English	4.5
6.	International, Research	4
7.	Flexible, Negotiation Skills, Soft Skills	3.5
8.	Projects	2

6. Development of Algorithm

This algorithm takes the resume of a candidate as an input into a program as a .CSV file and computes the score for every resume on the predefined criteria given by the organization in terms of dataset; keyword and associated weights.

6.1 Flowchart of Algorithm



6.2 Code snippet to read a CSV file

```
# Read CSV into R
MyData<-read.csv(file="c:/
TheDataIWantToReadIn.csv",header=TRUE , sep=",")
```

6.3 Algorithm to Compute Score

```
Open resume-database
Set index to first record
Read 'resume-file'
While not end of file [resume file]
        Read word
       While not end of file [keyword file]
         {If (word = keyword)
            Score = Score + Weight_k;
          Next keyword;
         }
       Next word
  Next record
 Close resume-database
```

7. Analysis of Salary Package

The algorithm computes the score which can be used to find out the salary package for that candidate. For example, a score of more than 500 points can suggest the HR manager to give a package of 6 lakhs per annum and give a comment 'Expert'. A score of 250 points can give a comment 'Novice' and suggest an annual package of 5 lakh.

8. Future Scope

Such expert systems can be developed for various major tasks involved in HR department.The data analytics can lead to various decisions pertaining to i) salary hikes ii) promotions iii) giving interdisciplinary tasks iv) layoffs. This can very easily smoothen the task of a HR manager and the supporting staff in analyzing the situation.

9. Conclusion

It is apparent that organizations cannot breathe in the long run if they do not have predictive analytics skills from the human resource management. HR predictive analytics will save time of HR managers from reading, discussing and screening lakh of resume. It produces better return on investment on HR managers in terms of man hours. The scope of predictive analytics is wider and hence application in all related areas of HRM is essential and can be developed. HRPA helps organizations contain HR-related costs while optimizing business performance as well as employee engagement and satisfaction. HRPA is rapidly changing and growing technology which has potential to achieve 100% accuracy in decision making for HR. Till 2020, HRPA will fully take over old methods of analytics in organizations.

10. References

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