Understanding Employee Attrition Pattern through HR Analytics - Generating Meaningful Insights

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ABSTRACT

One of the biggest problems faced by any organization is employee attrition and retention. It not only affects work flow and increases the cost for the organization it also hampers productivity of the organization. The study will evaluate factors affecting the employee's attrition in a company. This is an exploratory study based on secondary data available of the employees in a company. The analysis will be done through data mining using R tool. The data will be cleaned and then different models will be applied such as KNN Model, Regression, Random Forest to predict the employee attrition. The aim here is to identify data points and features which are crucial to engage employees and reduce unhealthy attrition rate as well as improve the quality of hire. The data points then can be monitored so as to improve quality of hire. Practical application is to measure the HR process effectiveness & help in enabling faster decision making through Key Insights. The paper is aimed at enabling the companies in improving their HR processes and drive performance through effective human capital management.

Keywords
Data Mining, HR Analytics, Prescriptive Analytics, Predictive Analytics, Employee Attrition, HR Metric

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Introduction

The most important and integral part of HRM is the decision making and managerial tasks on critical issues for a company. Decision making is considered to be most critical organizational undertakings among others such as behavior of the employees at workplace, their performance level, their motivation levels for the assigned work and the stress put on them at workplace. Macke, J., & Genari, D. (2019) To keep in perspective of how an employee should behave in an organization and their characteristics, different business behaviors and strategies can be aligned with effectiveness in critical areas such as decision making within organizational conditions.

HR analytics is a rather new but great intervention in the large context of HRM Edwards, M. R., & Edwards, K. (2019). That require the use of mathematical instruments and tests, complex visualizations to derive insights, mathematical conversion of HR Metrics which in turn is very helpful in understanding or supporting the most important decision in HRM strategies and practices. HR analytics proves to be a support function to the HRM as it provides with facts and data about the genuineness of decisions through statistics and it aides in the creation of new business strategies and other measures.

The present study is aimed at understanding the relationship between HR Analytics and its role to improve the existing HR related tasks and functions associated with it. It will give an analysis and relationship between the factors and features which affect the employee and lead to his/her separation from the organization. Since organizations spend a lot of their money on recruitment, unwanted separation is a pain point. If HR analytics could help in forecasting the employee's intent on leaving the organization then HRM could take engagement measures to stop that employee from leaving. This would result in better organization performance and employee's engagement will also increase thereby improving the quality of hire.

Literature Review

Birth of HR Analytics: Within a highly unpredictable corporate climate, human resources are the greatest strength a company has. HRM 's management of each and every employee with varied skills to enable the organizational strategy through shared goals and vision is a huge challenge. This also requires the need of managing such vast amount of data associated with an employee during entire employee life cycle in an organization for effective decision making. All this makes the requirement of tools to help the managers gain insights from the different functions of HR and then filter out the high potential performers from the rest of the employees. To help achieve this, there is a requirement of analytics which is a mathematical approach to understanding and quantifying data associated with employees related to organizational outcome. "HR Analytics" includes the use of statistical techniques, research design, and algorithms to evaluate employee data and translating results into evocative reports (Levenson 2005). HR analytics involves the application of mathematical model to employee data which in turn helps in predicting employee behavioral details like attrition, engagement, performance and costs associated with them. A traditional data management program includes the HRIS (Human Resources Information Program) compilation of workplace data and other maintained company records and then merging into a Data Warehouse where all the transformation of data happens which is then worked upon by statistical and mathematical models to provide and give an understanding of the hidden relations/patterns/probabilities between the different features of employee data.

The efficient HR Analytics can help HR managers execute HR activities, such as forecasting workplace demand and availability, finding appropriate jobs to complement worker preferences, assessing workforce preparation requirements, evaluating performance-based pay, and maintaining successful employee knowledge to determine benefits and maintain organizations. Generally, it helps HR administrators to make choices based on the outcomes of recruiting, selection, preparedness, advancement, career creation and organizational success and effectiveness.

HR Analytics Categories: The numerous computational styles include informative, predictive, and prescriptive analytics (Watson 2010; Narula 2015). Descriptive analytics is a preliminary stage of data processing which describes historical data in order to provide valuable insight and potentially prepare the data for further study. Data aggregation and data mining methods organize the data and enable patterns and relationships that would otherwise not be visible to be identified within it. It involves usage of SQL structured queries, data visualization, ad hoc reports, excel reports, visual dashboards etc. Attrition rate, hiring cost per employee and absenteeism can be evaluated based on descriptive analytics. Predictive Analytics involves predictions of future actions and results based on the happenings in the past. This involves the usage of data mining (fact correlation), decision trees, pattern analysis, predicting, root cause inquiry and predictive analytics. HR managers are assisted by predictive modelling in forecasting turnover levels, employee performance depends on recruitment / selection methods for work probabilities. When it comes to Prescriptive analysis, not only does it anticipate what will happen, and when, but also why. In addition, prescriptive analytics recommend options for taking advantage of a future opportunity or mitigating a future risk, and display the consequences of each decision choice.

HR Analytics Success Examples – HR Analytics is now widely being adopted and utilized in various ways to generate meaningful insights. One such example is of Google which utilized their expertise in analytics and statistics for people management during the interview. The questions which were put up for the interviewee are fully automated, as well as they are perfectly modified in the way that it is remodeled and researched through by understanding the profile of the candidate and relevant experience to find the best among all those who had applied and were considered suitable candidates. Google also used HR Analytics to estimate what is the probability an employee will resign from the company done through using HR predictive analysis, and got to know that Employees who may not obtain a raise during the first four years would potentially quit the organization.

Best Buy uses HR analytics to forecast store results based on employee engagement behaviors for each year, forecasting that a 0.1 per cent rise in employee engagement resulted in a $100,000 improvement in store sales. Hewlett-Packard (HP) also incorporated the usage of HR data analytics to forecast whether the employee is going to leave which they termed as "Flight Risk Score". They consider that higher wages and promotions as well as higher performance scores are adversely related to each other, and anyone who has achieved promotion but has not won wage rise is likely to quit the company in the near future.

HR Analytical Tools: There are many analytical tools available in the market but the most commonly used in the industry are from Business Intelligence providers such as SAP, IBM, Oracle and Microsoft. The BI platform has BI and data processing applications in HR modules (Wu, D. D., Kapoor, B., & Sherif, J. (2012)). R-Studio is a very common software application for data processing and visualization, which can be used for large data sets such as employee data sets. For computational data analysis and visualization, Python which is also widely considered by all data scientists. But companies opt for the most readily available software at their disposal that is MS Excel for analytics. Microsoft Excel is historically a powerful method for data processing, processing and converting data using algorithms, pivot tables, scenario design and visualization software. Another offering from Microsoft is a Power Business Intelligence platform capable of gathering data from multiple sources and making it easy for us to interpret, compile and visualize data.

Rasmussen and Ulrich's (2015) study claims the flow of HR Analytics, by providing statistically backed and verified data, it brings added value to managerial and HR decision making for an organization hence making it effective and efficient decision-making body. The study also aims that to reduce the risk of HR Analytics becomes yet another fad of management, hence it should be used to better the traditional HR processes and practices to provide quantifiable outcomes. There is a need to move from a upside down managerial approach to a more bottom up managerial practice where concrete action can be taken starting from starting level. The research by Ulrich and Rasmussen provides readers with case studies on the application of HR analytics in business processes and discusses its useful outcomes for maximizing performance and managing organizational talent growth. The study introduces a judicious tool which is HR Analytics to maximize HR's objective effect in attaining company objectives.

It is therefore important to understand how HR analytics should be used according to HR strategies and organizational outcomes predicted, as Mondore, Douthitt and Carson (2011) illustrated through their study on HR analytics and got the outcome on how to enable HR strategies and drive outcomes interest of organizations through HR Analytics. The steps outlined in the study include the identification of the most relevant findings; the creation of a cross-functional data plan; successful approaches to assess crucial results; planning and execution; evaluating, updating and making certain improvements post implementation. We also get to know through the study that how it can be employed to recognize and attain potential talent for the company's recruitment process planning. The suggested HR analytics program presented in the report is focused on application of certain organizations and thus can be understood as offering detailed input by subtle Recommendations such as rendering HR analytics available for individuals in business leadership roles.

Technology has driven the development of HR analytical tools and is increasingly integrating the landscape of the analytics. Now we are going to review some literature on the technological usage in decision-making to expand the

application of HR analytics. The study by Fairhurst (2014) provides with an overview of the extent of the measures to be taken to integrate data-driven architecture in HR analytics and to assimilate HRM research. The study listed a set of five measures that included procedure of translating business issues into questions of data understanding, i.e. some answers that with respect to company centric questions. Additional steps which are included in making the required arrangements for the systemization and storage of the acquired data; Interpretation of data by appropriate mathematical instruments and measures; further analysis of data through algorithms, machine intelligence and neural networking and reporting of results or conclusions in a consistent manner to the applicable organization or entity.

Study by King (2016) looked at the major part of HRM and applicability of HR analytics by indulging into a case study and then reviewing it critically. As per the report, Changes in the area have generated some doubt about the willingness of HR practitioners to use the evidence or information available to deliver positive outcomes. The thesis analyzed research that is dual in nature as well as pro and examines the disadvantages of human resource and application of analytics on this important function of a business and called participation in the conduct of analytics and related activities. The reading of case studies for the paper proved beneficial as it provided with practicality and suggested importance of applied and action-oriented approach towards HR business problems. Henceforth, the research established some strategic targets, proposed strategies such as outsourcing and ensuring that the data generated is accurate and under supervision, as well as creating frameworks for using the available data.

Jasmit Kaur and Alexis A. Fink (2017) conducted 22 interviews with 16 companies from which they discovered that most (94 percent) of the companies were using R Studio. It is used in the study and visualization of data, and is closely accompanied by Tableau (83%), another very common method for visualization and dashboard development. Python is also used by several organizations for data processing, data maintenance, management of the qualitative as well as quantitative data, and also about the application of machine adeptness or machine learning. Many businesses also use SPSS and Excel as standard and trustworthy tools for specialists in business analytics. A number of new technology tools that enable Artificial Intelligence are the IBM Watson Talent, Intel's Saffron, HireVue's video analytics platform. Sirota is used for Qualtrics, SurveyGizmo surveys and Cognos Visier is used for business intelligence and analytics. This list of emerging technology resources shows that HR analytics is still in the testing process and there is time for its widespread adoption.

Predictive Decision Making: Predictive analysis is used for predicting unpredictable events use mathematical data processing, simulation, Machine learning, data processing, and artificial intelligence (AI) to evaluate historical and present data to forecast possible outcomes. Analyzed and processed data is in big demand in HR is being demanded everywhere in the industry and is a growing area of utmost importance. HR predictive analytics is used in businesses by HR executives to model human activity and boost performance and provide organizations with Good financial performance by making actions based on statistical empirical approaches. This segment will analyze applicable literature to explain the predictive analysis of HR processes. Fitz-Enz, J., & John Mattox, I. I. (2014) research explored thoroughly predictive analytics and its role in the field, Analysis of the three stages at which the analytics are separated, including the predictive, descriptive and prescriptive analyses and the various strategies underlying them. The research explored the broad range of processes from the creation of an empirical supply chain to the production of analytical models to the different processes involved in the transformation of evidence into knowledge; Along with several descriptions of statistical data and functional quantitative studies. The research also provides examples of predictive analytics use. That involves building up templates to demonstrate how to utilize raw data and obtain knowledge and draw inferences, for example exit interviews performed by management may be an important method used to explain when prospective and underperforming employees want to quit and thus boost the organization’s potential.

In their 2016 study, Ballinger, G. A., Cross, R., & Holtom, B. C. (2016) analyzed the network structure 's role as a proxy for volunteer turnover. The work centered on the employee's social ties as a factor affecting the labour-capital cost of the business. The primary conclusion that can be made from the analysis to the employee turnover is that Employees with a more developed social network have more options for trading and recognition and are more inclined to exit company. Study by Mishra, S. N., Lama, D. R., & Pal, Y. (2016) explored the role of the predictive analytics domain within HR analytics. According to the report, through defining and recommending such measures that can be used for predictive modelling, HR predictive analytics have wide ramifications in all fields related to the management of human capital. It helps businesses to reduce compliance expenses due to HR-related steps, and to increase company performance and have higher employee retention levels. The study helps understand the correlation between factors like low talent retention and high attrition rate.

Jasmit Kaur and Alexis A. Fink (2017) Driven 22 interviews with 16 organizations showed that HR analytics firms are utilizing statistical models to hire, attract, distribute and schedule workplace compensation based on employee characteristics and attrition patterns. Organizations utilize HR analytics to involve workers through retention surveys, create recruiting plans focused on departmental vacancy positions obtained from HR, workforce turnover (transfers, promotions) and labor force data, gather employee feedback on good or poor management activities to allow managers to consider workplace preferences and growth needs. Measuring the success of educational systems is also a significant feature of HR analytics.

Saradhi, V. V., & Palshikar, G. K. (2011) worked on Employee churn prediction. Employee turnover contributes directly to the loss of employees yet not customer attrition like. They studied for this and compared some essential machine learning methods for halting attrition of employees. In this context they conducted different methods of making and compared different predictive attrition models for employees. This work is useful in building the best workforce Project forecast.

HR Analytics Data Governance Problems: Data Governance uses structured mechanisms to ensure the collection and use of accurate data in an ethical and legal manner. The HR Analytics field has potential for ethical and legal concerns as it uses new technology to source, analyzing vast amounts of data to promote strategic decision-making. Toyama, K. (2015) proposed that the first sin in Artificial Intelligence will be to enable computer programs (machines) to make ethically questionable choices, and to recommend that human decision-makers receive input from HR evaluations. Predictive models can be helpful in alerting decision-makers but not in making or reaching decisions. Although the actions do not break essential labor laws such as segregation, disabilities. Owing to HR data mining and the use of clean data for decision-making, Employee confidentiality, confidence and privacy are at stake.

Women in Nigeria have seen remarkable gains in workplace participation in the past three decades, with increased workforce engagement, significant educational gains, higher-pay employment, and significant real income gains. Despite these gains, however, the pay gap between men and women still exists for women in nearly every occupation [10]. Even in China, women managers are paid far less than men. More than individual characteristics, a large share of gender gaps can be attributed to the levels of an organization. Higher salaries are associated with fewer organization-level characteristics for female managers, and if they do show the characteristics then they are usually paid a smaller salary premium [11].

Studies have generally shown that working women typically experience major drawbacks at the workplace compared to men. Women are over-represented in less paying jobs (Banyard, 2010; Bradley, 2007). Although women are less autonomous and have a significantly lower status in the workplace than men, research has shown that women tend to exhibit higher levels of employment satisfaction than their male counterparts [12]. Researches have also shown that while men enjoy high-income job positions, responsibility and leadership opportunities; women prefer jobs with good colleagues, good managers and opportunities to help others [15]. Such employment differences stem from the socialization of the gender and the longing to combine family and work. Women want to integrate work and family more; hence they choose to work part-time more frequently [12], [16].

Research Methodology

This research work explains various supervised machine learning algorithms in brief. The ability to predict employee turnover has been demonstrated and evaluated. This section gives a summary of the theory behind certain algorithms and their usage in the forecasting of attrition rate and employee attrition in the future. The research also aims to get the best suited algorithm and model which has high accuracy overall. Some of those algorithms are defined below.

A. Reseach Method

Decision framework is a controlled method constructing classification or regression structures in a tree-like structure. It is a proven system, which Morgan and Sonquist first published in 1963. The decision tree algorithm is powerful yet simple to understand and implement. It can handle missing values and features in a data set and can select variables on its own but it has its limitations. It is usually not efficient when the model at hand is highly variable and even minute variations in the data can offset the tree structure to a great extent.

Random Forest is similar to decision tree with an improvement that it takes the ensemble approach by combining the weak links in a decision tree to form a stronger link. This approach is effective as it uses the divide and conquer method to build up the model. Here a reduction in variance is achieved by neglecting the majority of the predictors hence it is established that all of the individual trees are not being affected by some predictors. This way random forest approach is more reliable and consisting of less variability.

Logistic Regression, as proposed by Cox in 1958, is a standard classification algorithm that involves linear discriminants. The key contribution here is the likelihood that the reference point is in a certain class or area. The model sets a linear boundary, centred on the likelihood value. Logistic regression of linear groups is relatively straightforward to apply and works well, making it one of the most commonly employed classifiers.

Linear Regression establishes a mathematical equation between contingent and independent variables. When the independent variable is only one then it is called a simple linear regression and when there are multiple independent variables involved then it is termed as multiple linear regression. It is fairly easy to implement and works based on the mean of the data. Linear regression is extensively used to determine relationships between data and features. It is a conditional probability distribution and is widely used for analysis in wide range of business functions. Although the accuracy of linear models is not very high.

K-nearest neighbours is an algorithm where there are no parameters are defined exclusively and is mostly used for grouping and regression kind of questions. The goal here is to identify as many as possible K data points which are nearest to the desired attribute or parameter and to assign the new value as per the voting system and the distance from which it is far away from the neighbours it has. The very famous some of the distance formulas which are used everywhere include the Euclidean distance, the Manhattan distance and the third one is Minkowski method.

B. Sampling

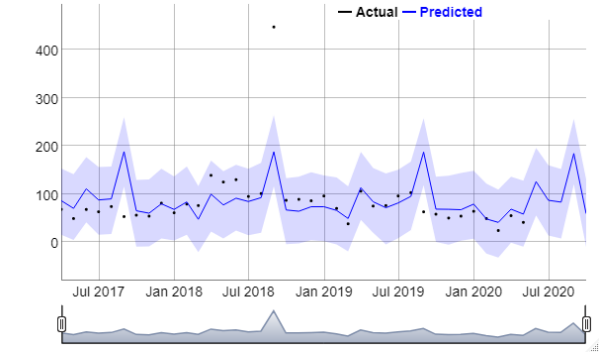
For this research there are two datasets which are used to look into the power of HR Analytics to forecast employee attrition and also predict attrition in the future. The first data set is a time series data of attrition rate per month for the company of Mahindra and Mahindra. The second data set is an employee dataset consisting of 1470 records and 35 fields. Employee database consists of all the information of all the employees who are working in a company and each record identifies an employee with his/her details and attributes.

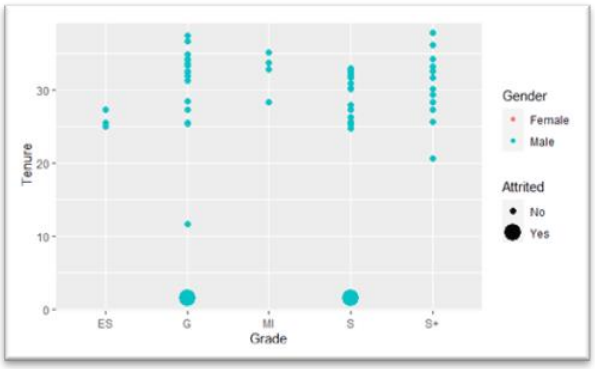
The primary time series data was analyzed through applying forecasting model in R software which is a powerful statistical tool for data visualization and analysis. This time

series data is of attrition numbers per month for the duration of 38 months. The most important model used to forecast in this case is prophet model. It is then plotted for future months to know about the future attrition rates. This is fairly simple forecasting as it does not take into account the reason of attrition and is only a tool to help HR managers look at the possible attrition levels in the future.

Results And Analysis

After the data modelling on R software, we get the following results. The meaning of this confusion matrix is that the data set was divided into testing and training data set. The prediction model when applied on the testing data set gives an idea about the data and how it is affected by the features on which it is dependent. Now once the model is trained on the training set, we need to check the validity of the prediction model and how reliant and accurate it is. For this to happen, we need to test the training model on our testing set. So, when we look at the test results of our prediction model, we see that we have got prediction accuracy of 98.38% since our model failed to predict the correct attrition for an employee only one. The testing and training data set were randomly mixed first to remove any patterns in the data and then the data was also randomly assigned to the respective data sets in 80:20 ratio. So, we can see from here that our model is accurate for the small data set of 62 observations.



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Confusion matrix:
     No Yes class.error
No   57   1  0.01724138
Yes   0   4  0.00000000
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The aim of this paper is to quantify the data which was last seen as qualitative in nature by HR Managers and then derive insights based on those parameters on various HR functions namely Employee Engagement, Employee Attrition/Separation, performance management among others. In this paper we are evaluating the effect of employee data attributes such as their age, tenure in the company, their designation in the company on the outcome whether they will leave or not. We also came up with an easy to adapt model of time series forecast of attrition rate which is new since it considers the attrition data for the previous years. It shows how past data could be utilized to forecast attrition by using R tool. The time series analysis is an easy way to understand this employee metric and take decisions by HR Managers.

Limitation

The major challenges and limitations of the research undertaken concentrate mainly on the abundance of data which could be analyzed and successful case studies on the topic of HR Analytics and its complete integration into organizational framework. There is a significant void which is presently left in the current statistical modelling literature and there is also a limitation considering the organizational research are constrained in scope. Therefore, current research needs to be adequately comprehensive and focused on case studies in statistical analysis and operational studies to ensure that the accepted models and road maps are safe, tested and tried many times.

Recommnedation

When we come to the part of recommendations to improve the study and its applicability, we must review more and more real-life case studies where the application of HR Analytics and predictive analysis really helped an organization to take decision and saved money. One must also study the various applications of predictive analysis other than forecasting attrition for employees. Researching on the motivation and engagement levels of an employee could be mapped through cluster analysis where what they post online regarding work could be analyzed and then actions can be taken to improve engagement/motivation through the generated insights.

HR Analytics will continue to expand and more users will get added every day to its applicability. The essence of HR Analytics is the data backed decision making which it provides but the decision will be taken by the human part of the organization as HR Analytics can only suggest the way ahead but it remains up to us whether we want to execute it or not.

References

[1] Levenson, A. (2005). Harnessing the power of HR analytics. Strategic HR Review.

[2] NARULA, S. (2015). HR ANALYTICS: ITS USE, TECHNIQUES AND IMPACT. CLEAR International Journal of Research in Commerce & Management, 6(8).

[3] Wu, D. D., Kapoor, B., & Sherif, J. (2012). Human resources in an enriched environment of business intelligence. Kybernetes.

[4] Rasmussen, T., & Ulrich, D. (2015). Learning from practice: how HR analytics avoids being a management fad. Organizational Dynamics, 44(3), 236-242.

[5] Mondore, S., Douthitt, S., & Carson, M. (2011). Maximizing the impact and effectiveness of HR analytics to drive business outcomes. People and Strategy, 34(2), 20.

[6] Fairhurst, P. (2014). Big data and HR analytics. IES Perspectives on HR, 2014, 7-13.

[7] King, K. G. (2016). Data analytics in human resources: A case study and critical review. Human Resource Development Review, 15(4), 487-495.

[8] Kaur, J., & Fink, A. A. (2017). Trends and practices in talent analytics. Society for Human Resource Management (SHRM)-Society for Industrial-Organizational Psychology (SIOP) Science of HR White Paper Series. Source: http://www. siop. org/SIOPSHRM/2017% 2010_SHRM-SIOP% 20Talent, 20.

[9] Fitz-Enz, J., & John Mattox, I. I. (2014). Predictive analytics for human resources. John Wiley & Sons.

[10] Ballinger, G. A., Cross, R., & Holtom, B. C. (2016). The right friends in the right places: Understanding network structure as a predictor of voluntary turnover. Journal of Applied Psychology, 101(4), 535.

[11] Mishra, S. N., Lama, D. R., & Pal, Y. (2016). Human Resource Predictive Analytics (HRPA) for HR management in organizations. International Journal of Scientific & Technology Research, 5(5), 33-35.

[12] Saradhi, V. V., & Palshikar, G. K. (2011). Employee churn prediction. Expert Systems with Applications, 38(3), 1999-2006.

[13] Mohammed, D., & Quddus, A. (2019). HR Analytics: A Modern Tool in HR for Predictive Decision Making. Journal of Management, 6(3).

[14] Toyama, K. (2015). Geek heresy: Rescuing social change from the cult of technology. PublicAffairs.

[15] Narula, S. (2015). Hr Analytics: Its Use, Techniques And Impact. Clear International Journal of Research in Commerce & Management

[16] Wu, D. D., Kapoor, B., & Sherif, J. (2012). Human resources in an enriched environment of business intelligence. Kybernetes.

[17] Andrews, F., Morgan, J., & Sonquist, J. (1967). Multiple classification analysis: A report on a computer program for multiple regression using categorical predictors.

[18] Cox, D. R. (1958). Two further applications of a model for binary regression. Biometrika

[19] Marler, J. H., & Boudreau, J. W. (2017). An evidence-based review of HR Analytics. The International Journal of Human Resource Management, 28(1), 3-26.

[20] Angrave, D., Charlwood, A., Kirkpatrick, I., Lawrence, M., & Stuart, M. (2016). HR and analytics: why HR is set to fail the big data challenge. Human Resource Management Journal, 26(1), 1-11.

[21] Sharma, A., & Sharma, T. (2017). HR analytics and performance appraisal system. Management Research Review.

[22] Van den Heuvel, S., & Bondarouk, T. (2017). The rise (and fall?) of HR analytics. Journal of Organizational Effectiveness: People and Performance.

[23] Ben-Gal, H. C. (2019). An ROI-based review of HR analytics: practical implementation tools. Personnel Review.

[24] Fernandez, J. (2019). The ball of wax we call HR analytics. Strategic HR Review.

[25] Stone, C. B., Neely, A. R., & Lengnick-Hall, M. L. (2018). Human resource management in the digital age: Big data, HR analytics and artificial intelligence. In Management and technological challenges in the digital age (pp. 13-42). CRC Press.

[26] Mayo, A. (2018). Applying HR analytics to talent management. Strategic HR Review.

[27] Reddy, P. R., & Lakshmikeerthi, P. (2017). HR analytics-An effective evidence based HRM tool. International Journal of Business and Management Invention, 6(7), 23-34.