Role of Descriptive, Predictive and Prescriptive Data Analytics in HR: A Deep Insight into Talent Management

Geetika Parmar

Abstract **- The Human resources department of any big organization is becoming very demanding in terms of companywide HR operations. The management leaders are resorting to analytics solutions to extract meaning from the huge volumes of data to help improve decision making in HR especially pertaining to Hiring talent, retaining talent and Training & Performance management of employees. The objective of this study is to understand the role of descriptive, predictive and prescriptive HR analytics in various talent management business operations.**

This paper covers the different aspects of the business analytics into the working of the organizations so that better productivity and performance could be extracted from the employees. It also describes the role of business analytics in order to manage the talent of employees. This study also looks into the different ways in which big data analytics is shaping Talent Management and also presents a review of literature available on transformation of talent management using Big Data Analytics tool.

Keywords **- Predictive Analytics, Descriptive Analytics, Prescriptive Analytics, Business Analytics (BA), Talent Management, Big Data Analytics (BDA), Human Resource (HR), HR Metrics, HR Analytics.**

I. INTRODUCTION

Data Analytics is the application of analytical process through which the collection, storing and examination of facts and figures are done. refers to the capabilities, technology, practices for non-stop iterative exploration and research of beyond commercial enterprise performance to gain insight and drive enterprise planning. Commercial enterprise analytics specializes in growing new insights and understanding of commercial enterprise overall performance primarily based on facts and statistical techniques. In contrast, commercial enterprise intelligence traditionally specializes in using a regular set of metrics to each measure beyond performance and manual enterprise planning, which is likewise based on statistics and statistical methods.

Research Scholar and Assistant Professor, Faculty of Management (Under Graduate)
MIT World Peace University, Pune, Maharashtra, India
geetika.rathod@gmail.com

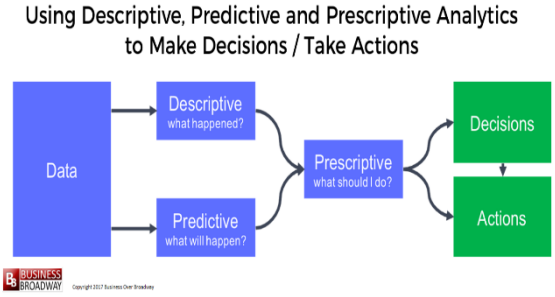
Data analytics makes great use of statistical evaluation, together with explanatory and predictive modelling, and truth-based totally control to pressure choice making. Big data analytics tools can be used as input for human selections or may additionally force completely automatic decisions. Enterprise intelligence is querying, reporting, online analytical processing (OLAP), and "indicators." Enterprise analytics can answer questions like why is that taking place, what if these tendencies continue, what's going to appear next (expect), and what is the great final results that could occur. In order to manage the talent and business processing, there are various kinds of business analytics which plays an important role in an organization.

HR Analytics is primarily a communication device, which cohesively works on data from disparate sources such as surveys, records, and business operations to paint an actionable picture of current conditions and likely future outcomes. It is an evidence-based approach to make better decisions for the future. Analytics is divided into three levels:

1. **Descriptive:** Traditional HR metrics are largely efficiency metrics like turnover rate, time, cost of hire, number hired and trained etc. Descriptive HR Analytics reveal and describe relationships and current & historical data patterns. It is basically used for gaining insight of the past. They are useful because they allow us to learn from past behaviours and understand how they might influence future outcomes.
2. **Predictive**: This category of analytics has to do with making predictions about the future which are derived from the current and historical data. They provide organizations with actionable insights based on data. Predictive analysis covers a variety of techniques which encompasses areas of statistics, modelling, data mining that use current and historical facts to make predictions about the future. It involves models used for increasing the probability of selecting the right talent to hire, train and promote.
3. **Prescriptive**: The relatively new field of business analytics allows users to "prescribe" a number of different possible actions and guide them towards a solution. This category of analytics is basically for suggesting the best course of action for the predictions made

using predictive modelling. This also provides recommendations regarding actions that will take advantage of the predictions.[1]

This helps in making better decisions and enhancing employee performance [2]. All these three phases of Analytics can be performed through professional services or technology or a combination of both. The process starts with simple reporting of HR metrics and goes all the way up to prescriptive modelling of business practices. Although cash and intangible assets are the lifeline of a business, it is human capital that apply cash and leverage intangible assets to drive business performance. As you move from descriptive to prescriptive, the value addition grows exponentially [9].



Source : businessoverbroadway.com

II. EMERGENCE OF BIG DATA IN HR

In earlier days the human resource department was completely dependent upon management information systems, which use to give them the required data for managing talent in terms of reports and graphs. But with the advent of big data analytics technology and increasing real time demands of the HR industry, it is becoming crucial to implement and have such systems in place. Big data analytics tools provided by major technology vendors like IBM, SAP, Oracle, Visier and Evolv offer HR analytics solutions (Tools and Techniques), which can be customized by the HR managers, pacing with their needs, to get edge in decision making. Relying only on the management information systems it is difficult to predict human resource needs of the organisation, growth curve of the employees and employee turnover effectively. If HR uses this Big Data philosophy and continue to explore such technology, HR department can yield more accurate and objective data.[3]

With the growing amounts of employee, customer, and transactions data, Human Resources departments are compelled to divert themselves towards the newer technologies to help quicker decision-making amid a volatile business atmosphere.

A huge quantity of talent or people-related data pertaining to employee skill set, performance ratings, age, tenure, sales performance, academic background, managing previous roles etc. With such voluminous data, HR professionals can judge and enhance practices like recruitment, training and development, performance, compensation, and overall business performance.

III. APPLICATION OF BIG DATA IN HR

The Human Resource department is an essential element of any organization. The HR department is responsible for recruiting, training, placing and managing the human resources of the companies. It is found that the in many service company's new technologies have been adopted. The HR managers are facing difficulties to take provide adequate training and motivation to the employees as the employees are having different needs and aspirations [4]. Moreover, some employees are not found to be cooperative in nature because of which the HR managers were not able to motivate the employees in a progressive and constructive manner.

Big data denotes gathering data from several data sources and collate same using HR analytics tool for decision making. HR data need to be big data for its obvious alignment with the organizational business and strategies.

Big data for human resources helps us in assessing the trends, patterns, correlations and further insights into intricacies of HRM in relation to organizational business and strategies. Even for understanding employee engagement, which is more related to HR decisions for HR functions, we need Big Data in terms of performance results, productivity, employee promotion and transfer data and so on. Thus, Big data for Human Resources facilitates better informed HR decision making, as it can give better insight into business situations and ensure better HR results in terms of retention, training and HR acquisition.

IV. PRELIMINARY LITERATURE REVIEW

4.1 Business analytics in Human Resource Departments of service industry

According to Wang, Gunasekaran, Ngai & Papadopoulos, (2016), business analytics is referred to the examination of skills, technologies, applications, and procedures that are utilized by the different companies to get a better knowledge and learning of the data and statistics that are related to business so that the organizations could run their businesses accordingly[5]**.** It is used to carry out evaluations procedures that are related to the different operations of the companies. It also helps the Human resource management by making implications with data management and warehousing technologies. The use of Business Analytics (BA) into the working of

the service sector companies like Tata Consultancy Services, Infosys, Wipro, etc. help in acquiring fact-based data, statistics, Quantitative Analysis, business modelling, and data investigation. This helps the Human Resource managers to determine and examine the performance of employees. It is necessary to analyse the performance of the employees so that they could be recognized and awarded for their better performance. The application of BA will enable the HR managers to forecast the performance of the employees on the basis of their historical information. It will also help the HR managers to record, examine, validate, explore, and understand the data in a more comprehensive way. Through the application of BA repetitive trends could be identified that will enable the HR managers to identify the underlying problems and provide better solutions.

4.2 Implications of business analytics towards talent management in service industry

According to Wamba, Gunasekaran, Akter, Ren, Dubey & Childe, (2017), Data management is referred to as the procedure that is implemented by the organizations to maintain and organize the data processes. This is done so that information could be circulated and utilized by the service companies in an effective way [6]. By using this technique of DA (Data Analytics), companies track systems through which the activities of the employees could be recorded. BA helps in talent acquisition by providing algorithms that are more than the available data. Talent management is referred to the steps taken by organizations to manage the talent present in the organization. Business analytics helps in finding talent that is similar to current top talent, controlling, tracking, managing to recruit and hiring practices, etc. it also helps in talent nurturing through which predicting and harvesting of potential becomes easier**.** Data reveals that due to implementation of BA into its talent acquisition process Wipro was able to match the profile of the employees to the job requirement. This helped the HR managers to recruit the right individual for the right position. Because of which the productivity of the Wipro company increased by 7.8%. Data warehousing is referred to the system which can be used to carry out data analysis procedure. It is found to be the main element of business intelligence (BI). It is the centre point of all the analytical sources. By using this technique of DA, the complex analytical queries could be done in a proper manner. Data reveals that due to the implementation of data warehousing in the operating system of HCL Technologies, the HR managers are able to analyse of the facts and figures related to the talent management of the employees in an appropriate manner. It was found that the HR managers were able to identify and assign the work to the employees in a better manner because of which the employees were able to accomplish their task in real time. This increased the productivity of the company to high levels. The productivity of service company HCL Technologies increased to about 32.9 % from the earlier levels of 21.8%.

Data reveals that Mahindra Group has applied BA to its working operations due to which the employee's feedback could be gained properly. This enabled the Mahindra Group Service Company to bring about necessary changes into its operative systems due to which the performance of the employees and productivity of the company increased significantly. As per Rasmussen & Ulrich, (2015) point of view, the productivity of the Mahindra group increased to 37.8% which was about 23.7% earlier [7]. The inclusion of BA also enables to track employee efficiency and monitor talent retention in an appropriate manner. The HR managers were able to track, accumulate and report the factors that could motivate the employees exponentially. The use of BA is also done by the HR managers to track the various implication of training process that is being conducted by the companies. The training programs that are initiated by the companies help in developing the leadership skills of the employees which helps the HR in reducing employee retention rates. The use of such technological advancements the HR will be able to identify the needs of the companies in a proper manner and could suggest recommendations and improvements in a better way. This will strengthen the company and reduce employee turnover rates.

V. WAYS BUSINESS ANALYTICS IS SHAPING TALENT MANAGEMENT

Managing talent effectively places a huge demand on any organization. And with the advent of the Big Data technology, the talent management tasks are taking a different shape considering the below tasks:

i. **Performance Management**:

Most of the times HR departments of the organisations have a tough time managing the employee performance. Performance management allows the organization to find out skill gaps and hence design learning and development programs, retain employees and do appropriate succession planning. Data analytics helps a great deal in managing the performance of the employee or team of employees. As this technology is completely driven by mathematical and statistical models working in the background, it provides a very methodical approach for assessing and managing the employee performance. By doing so, the HR will be able to monitor employee performance at regular intervals and predict their

behaviour, that may have an effect on their engagement levels.

ii. Talent retention:

A key HR concern for businesses is talent retention. There are significant financial and intangible costs associated with losing loyal and high-performing talented employees. Organisations have to incur a huge cost to find, hire, and train their replacements. Many companies have resorted to predictive analytics to enhance their ability to mitigate the risk of employee turnover and increase talent retention. Big data analytics tools heave been widely used by the organisations to predict the employee turnover. These statistical models help the HR managers to predict turnover and make conducive work environment for the top performers. This helps in reducing the top performer turnover. These statistical models use the historical data to identify which variables are used to as strong predictors of retaining talent and employee turnover. This analysis informed the development of focused retention strategies. [8]

iii. Training and Development:

The role of predictive analytics in employee performance is now clear. At the same time, this technology also gives the organisation, knowledge about the necessary skills that the organisation needs to thrive in the future. It is important that the organisations understand the skill sets of its current employees and clearly map with the future skill sets needed to thrive. The skills needed to thrive in 2020 will look drastically different in 2035. Predictive analytics technologies efficiently help in mapping the workforce inefficiencies with e employee skill set gaps. This real time employee data allows the organisations to draft a training and development plan and see how employees can progressing towards the future. Using employee data, the algorithms can predict the state of the organisation if it continues to work with the current skillset of the employees. Hence, employers can then make informed decisions on training and development activities for employees which will benefit the employer and its employees in the long run.

VI. REAL WORLD APPLICATIONS OF HR ANALYTICS IN INDUSTRIES

BA helps in talent acquisition by providing algorithms that are more than the available data. Talent management is referred to the steps taken by organizations to manage the talent present in the organization. Business analytics helps in finding talent that is similar to current top talent, controlling, tracking, managing to recruit and hiring practices, and many more. It also helps in talent nurturing through which predicting and harvesting of potential becomes easier [10]. Data reveals that due to implementation of BA into its talent acquisition process Wipro was able to match the profile of the employees to the job requirement. This helped the HR managers to recruit the right individual for the right position. Because of which the productivity of the Wipro company increased by 7.8 percent. Data warehousing is referred to the system which can be used to carry out data analysis procedures. It is found to be the main element of business intelligence (BI). It is the centre point of all the analytical sources. By using this technique of Data Analytics, the complex analytical queries could be solved in a proper manner [11]. Data reveals that due to the implementation of data warehousing in the operating system of HCL Technologies, the HR managers are able to analyse the facts and figures related to the talent management of the employees in an appropriate manner. It was found that the HR managers were able to identify and assign the work to the employees in a better manner because of which the employees were able to accomplish their task in real time. This increased the productivity of the company to high levels. The productivity of service company HCL Technologies increased to about 32.9 percent from the earlier levels of 21.8 percent [12].

VII. WHAT DOES THE FUTURE LOOK LIKE?

In the near future, the HR department will envisage the below changes in the organisation:

i. There will be extensive use of talent management software on which the HR Department can completely rely for day to day talent management activities on regular basis.
ii. Data scientists will have a major role to play within HR departments to assess the various talent management parameters and use prescriptive tools to decide the course of future actions.
iii. HR departments will be more empowered in terms of managing HR activities and increase productivity of the employees. Predictive analytics will help managers in driving HR strategies and aligning them well with the business goals.

VIII. CONCLUSION

Human resources are in the midst of a transformation. Ever changing human dynamics within the organisation, and an increasingly competitive talent landscape have raised employee expectations from their workplace to new heights. The result is that talent management is being redefined with the utilisation of technology and analytics in new and innovative ways, to fulfil the dynamic business demands. Once an organization understands the importance and benefits of predictive analytics and big data tools, it can use them to develop tactical

solutions for various HR functions and long-term strategic plan as per the need of the organisation. The benefits that such emerging technologies reap can automate the hiring process and as well reduce costs and speed up the time to hire.

Skills for data integration, transforming data into valuable insights and then managing and monitoring employees would be essential requirements for future human resources.

REFERENCES

[1] https://halobi.com/blog/descriptive-predictive-and-prescriptive-analytics-explained/

[2] Wang, Y., Kung, L., & Byrd, T. A. (2018). Big data analytics: Understanding its capabilities and potential benefits for healthcare organizations. *Technological Forecasting and Social Change*, *126*, 3-13. https://www.researchgate.net/.../295920015_Big_data_analytics_Understanding_its_ca...

[3] Zang, S.Y. and Ye, M.L. (2015) Human Resource Management in the Era of Big Data. Journal of Human Resource and Sustainability Studies, 3, 41-45. http://dx.doi.org/10.4236/jhrss.2015.31006

[4] Pape, T. (2016). Prioritising data items for business analytics: Framework and application to human resources. European Journal of Operational Research, 252(2), 687-698. https://ideas.repec.org/a/eee/ejores/v252y2016i2p687-698.html

[5] Wang, G., Gunasekaran, A., Ngai, E. W., & Papadopoulos, T. (2016). Big data analytics in logistics and supply chain management: Certain investigations for research and applications. International Journal of Production Economics, 176, 98-110. https://econpapers.repec.org/article/eeeproeco/v_3a176_3ay_3a2016_3ai_3ac_3ap_3a98-110.htm

[6] Wamba, S. F., Gunasekaran, A., Akter, S., Ren, S. J. F., Dubey, R., & Childe, S. J. (2017). Big data analytics and firm performance: Effects of dynamic capabilities. Journal of Business Research, 70, 356-365. https://ro.uow.edu.au/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=193&context=buspapers

[7] Rasmussen, T., & Ulrich, D. (2015). Learning from practice: how HR analytics avoids being a management fad. Organizational Dynamics, 44(3), 236-242. https://www.sciencedirect.com/science/article/pii/S0090261615000443

[8] Grillo, M., & Hackett, A. (2015). What types of predictive analytics are being used in talent management organizations from Cornell University, ILR School site: http://digitalcommons.ilr.cornell.edu/student/74

[9] Predictive Analytics for Human Resources, by Jack Fitz-Enz and John R. Mattox II, Wiley.

[10] Liu, Y. (2014). Big data and predictive business analytics. The Journal of Business Forecasting, 33, 40–42.

[11] Hagstrom, M. (2012). High-performance analytics fuels innovation and inclusive growth: Use big data, hyperconnectivity and speed to intelligence to get true value in the digital economy. Journal of Advanced Analytics, 3–4.

[12] Ward, D. G. J. D. (2014). A guide to the strategic use of big data. Information Management, 48, 45–47.