"RESEARCH ON HR ANALYTICS USING POWER BI AND MACHINE LEARNING"

Prof. Ashvini Ganesh Bhosale[1], Ms. Rashmi Mrugank Shah[2], Ms. Ankita Anil Patil[3], Ms. Anisha Anil Khamkar[4]

Ms. Rashmi Mrugank Shah[2], Students, Dept of Computer Engineering, GSMCOE, Maharashtra, India
Ms. Ankita Anil Patil[3], Students, Dept of Computer Engineering, GSMCOE, Maharashtra, India
Ms. Anisha Anil Khamkar[4], Students, Dept of Computer Engineering, GSMCOE, Maharashtra, India

ABSTRACT

A subject of vast knowledge in which predictive and descriptive analytics is of its main components which includes employee work performance analysis, promotion analysis and attrition rate analysis as results. The main purpose of Human Resource management is to measure the achievement of employees and their role in the work services or business which acts as benefits to the company and to analyze employee period in the company. The main motto of Human Resource analytics is to identify skilled individuals strive extremely for of who the return investment for the organization by considering several factors which a better understanding of the for help predictive analysis. Employee is individual churn by considered a major problem for many organizations. It is one of the crucial problems to identify because it affects sustainability and also the organization" s planning and enhancing work culture harmony. Therefore, the Human Resource department in every organization is striving hard paying attention identify underlying and the to improvements. By identifying this demand, the study aims to increase the ability to identify employee churn using POWER BI with the help of real-time data insights in dashboards for HR management.HR report is an analytical method used to display human resources -related status , insights , and metrics with the primary purpose of improving workforce performance , recruiting procedures and other relevant HR processes with the help of HR dashboards.

Keywords: *Predictive analysis, employee churn ,power BI, random forest ,logistic regression, HR management*

Introduction

HR report is an analytical method used to display human resources-related stats, insights, and metrics with the primary purpose of improving workforce performance, recruiting procedures and other relevant HR processes with the help of HR dashboards Human Resource (HR) analytics is an integrated approach to improvise the decision making capability to achieve organizational goals. High-end predictive modelling is used in HR analytics where the organization faces the scenarios to forecast the consequences of the organization or enterprise policies [4]. Most of the organizations lack a widespread look towards the workforce and require human resources predictive, analysis to perform workforce development and is necessary for the organization to develop various aspects of the company such as IT and financial skills for better ROI(Return On Investment). Predictive analytics is much of forecasting the organization's goals based on the workforce rather than a descriptive analysis .

An HR dashboard is a business intelligence tool that allows Human Resource teams to track, analyze and report on HR KPIs. Modern, interactive dashboards leverage an HR analytics platform which makes it easy to combine data from all systems and to deeply explore this data directly within the dashboard. This way, HR teams can quickly find insights that will improve recruiting, optimize workplace management and enhance employee performance.

Employee performance dashboards help HR teams and business managers understand the effectiveness, satisfaction and goal progress of their workforce. To analyze compensation vs. performance this project shows the number of active employees by rating level and salary by employee rating.

Employees are the most important asset within an organization. This HR dashboard project shows an HR leader training program metrics such as completion percentage, hours and cost. Interactive charts allow the user to break out data by dimensions like department, program, gender and more.

HR executives strive to maintain a diverse and balanced workforce, so they need to fully understand the demographic characteristics of their employees. HR dashboard analysis allows them to deeply analyze data on age, gender, location, department and ethnic groups. Using an interactive dashboard, HR professionals can dig deeper into demographic data and analyze one variable, such as ethnic diversity.

The second part of this HR dashboard looks at the Overall Labor Effectiveness (OLE), ie. employee productivity. It helps to measure the workforce efficiency over time according to specific criteria and goals that your business sets. The 'traditional' approach to work such as the 9-to-5 workday is changing as flexibility becomes the main requirement for new generations of workers. So, the traditional way of measuring performance by watching who is showing up and for how long is more and more obsolete – what matters is what people have actually achieved. This is why setting up an employee productivity index is important, and even if it is traditionally measured dividing the total sales by the number of employees, the standards change from one organization to another, from function to function, and have to be tailored to your business specificities.

Another metric that you can track on your HR dashboard template and that is linked to the previous ones is the average overtime hours worked by your employees. Tracking the overtime hours is a good thing to see if your personnel is understaffed, or may lack a bit of training in certain areas, which will impact their productivity. It might also indicate a sudden rise in activity and business growth. But it shouldn't become the norm, because a constant high pressure and work fatigue will inevitably lead to demotivated and unsatisfied employees that will then tend to not show up or call sick. A simple way for you to fix abnormally high overtime hours is to hire and train new workers. That might impact your finances and momentarily increase your training costs, but it is always a certain risk to take and when the hiring is made correctly, the return on such investment always pays off.

An HR dashboard is an advanced analytics tool that displays important HR metrics using interactive data visualizations. It helps the HR department to improve recruiting processes, optimize the workplace management as well as to enhance the overall employee performance. Just like so many of today's business departments, human resources is slowly but surely evolving into a data-driven function. Filled with numerous HR KPIs, the purpose is to go from simple reporting to smarter use of analytics, enabling companies and managers to track and predict employees' performance, make better-informed talent decisions, and have the opportunity to operate advanced workforce planning with the help of modern HR analytics software. Turning to a professional online dashboard, HR professionals can keep a close eye on employee performance, recruiting, and talent management processes.

This first human resources dashboard focuses on the employees' behavior and performance. It provides an overview for managers of their workforce and how they work: the first part on top of this HR dashboard informs us of absenteeism, the average yearly absenteeism in days, the average rate and their evolution over the last five years. This is an important indicator as it illustrates the workers' engagement and motivation. Indeed, low-motivated workers are more likely to call in sick or skip workdays, and their overall productivity is naturally impacted. This is a metric to keep under your watch because a high absenteeism rate will really harm your finances and your business in general, so digging into the potential causes and reasons for absenteeism is a must-do.

The second part of this HR dashboard looks at the Overall Labor Effectiveness (OLE), ie. employee productivity. It helps to measure the workforce efficiency over time according to specific criteria and goals that your business sets. The 'traditional' approach to work such as the 9-to-5 workday is changing as flexibility becomes the main requirement for new generations of workers. So, the traditional way of measuring performance by watching who is showing up and for how long is more and more obsolete – what matters is what people have actually achieved. This is why setting up an employee productivity index is important, and even if it is traditionally measured dividing the total sales by the number of employees, the standards change from one organization to another, from function to function, and have to be tailored to your business specificities.

Another metric that you can track on your HR dashboard template and that is linked to the previous ones is the average overtime hours worked by your employees. Tracking the overtime hours is a good thing to see if your personnel is understaffed, or may lack a bit of training in certain areas, which will impact their productivity. It might also indicate a sudden rise in activity and business growth. But it shouldn't become the norm, because a constant high pressure and work fatigue will inevitably lead to demotivated and unsatisfied employees that will then tend to not show up or call sick. A simple way for you to fix abnormally high overtime hours is to hire and train new workers. That might impact your finances and momentarily increase your training costs, but it is always a certain risk to take and when the hiring is made correctly, the return on such investment always pays off.

Various HR Processes:

1. Human resource planning (Recruitment, Training, Orientation, Evaluation, Promotion and Layoff).
2. Employee remuneration and Benefits Administration.
3. Performance Management.
4. Employee Relations.

The efficient designing of these processes apart from other things depends upon the degree of correspondence of each of these. This means that each process is subservient to other. You start from Human resource Planning and there is a continual value addition at each step.

1. **Human Resource Planning:** Generally, we consider Human Resource Planning as the process of people forecasting. Right but incomplete! It also involves the processes of Evaluation, Promotion and Layoff.
2. **Employee Remuneration and Benefits Administration:** The process involves deciding upon salaries and wages, Incentives, Fringe Benefits and Perquisites etc. Money is the prime motivator in any job and therefore the importance of this process. Performing employees seek raises, better salaries and bonuses.
3. **Performance Management:** It is meant to help the organization train, motivate and reward workers. It is also meant to ensure that the organizational goals are met with efficiency. The process not only includes the employees but can also be for a department, product, service or customer process; all towards enhancing or adding value to them.
4. **Employee Relations:** Employee retention is a nuisance with organizations especially in industries that are hugely competitive in nature. Though there are myriad factors that motivate an individual to stick to or leave an organization, but certainly few are under our control.

All processes are integral to the survival and success of HR strategies and no single process can work in isolation; there has to be a high level of conformity and cohesiveness between the same.

HR KPI's:
Headcount summary:
Headcount summary explains present headcount of employees by Location, race, gender, department, company, job level and timeline.

Employee Service Analytics:
This view explains average service by employees in its organization by various segments like company, job level, service department and location.

Promotion Status:

No. of employees that needs to be promoted to the higher position based on their performance, experience and other factors that contribute to the employees promotion.

Employees of the Month:
There needs to be an system and checklist in place to identify the best employees based on different attributes and the output of the analysis based on those attribute will provide us with our desired result.

Employee Satisfaction:
This is a very important HR KPI one should not neglect, especially due to the 'war for talent'. Employee satisfaction is dependent on a range of factors beyond just financial benefits. These include a positive work-life balance, remote working and flexible working options, non-monetary benefits.

Employee Productive:
This KPI is going to measure the efficiency of your workforce. It analyses how long it takes for employees to accomplish certain tasks and goals that have been set for their position in the company.

Education and Training:
Courses and L&D programs for employees have a direct impact on the company's activity. This HR KPI is meant to help boost the productivity levels of each employee. It does this by creating specific strategies to increase the loyalty and satisfaction levels that employees feel when working with the company.

Duration in the Position:
If they feel they won't be promoted, many employees tend to look for new opportunities outside of the company.

LITERATURE SURVEY

Nucleus Research, 2014 states Analytics pays back $13.01 for every dollar spent.

• In paper A Study on the Acceptance of HR Analytics in Organisations by Lije George and T. J. Kamalanabhan, 2016 states that the popularity of business analytics can also be seen in the growth of the business analytics software market which was valued as $40 million worldwide with a growth rate of 6.5%

• Workforce Analytics Market Analysis By Type (Solution, Services), By Services (Managed, Consulting, System Integration), By Deployment, By Organization, By Application, By Region, And Segment Forecasts, 2018 – 2025 Published Date: Jun 2017 - Base Year for Estimate: 2016 - Report ID: GVR-1-68038-947-0 - Format: Electronic (PDF) - Historical Data: 2014 – 2015 valued the global workforce analytics market size at USD 430.9 million in 2015.

• Global HR analytics market to grow by 12% by Anushree Sharma on People Matters states the report Outlook on the World HR Analytics Market, 2019-2025 estimates around 12 percent growth at CAGR in the global HR analytics market by 2019-2025.

• Markets and Markets estimates growth from USD 1.9 billion in 2019 to USD 3.6 billion by 2024 at CAGR of 13.7% in the global HR analytics market size as stated in Human Resource Analytics Market Component, Application Area in Workforce Management, Recruitment, and Employee Development, Organization Size, Deployment Type, Vertical (Industry like Banking, Financial Services And Insurance, Manufacturing, and IT and Telecom), showing Region to Global Forecast from 2019-2024. Published Date: Jun 2019 | Report Code: TC 7162 states

METHODOLOGY

Simple random sampling

In this case each individual is chosen entirely by chance and each member of the population has an equal chance, or probability, of being selected. As with all probability sampling methods, simple random sampling allows the sampling error to be calculated and reduces selection bias. A specific advantage is that it is the most straightforward method of probability sampling. A disadvantage of simple random sampling is that you may not select enough individuals with your characteristic of T interest especially if that characteristic is uncommon.

Research Design

As we know, the research design refers to the overall strategy that you choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring you will effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data.
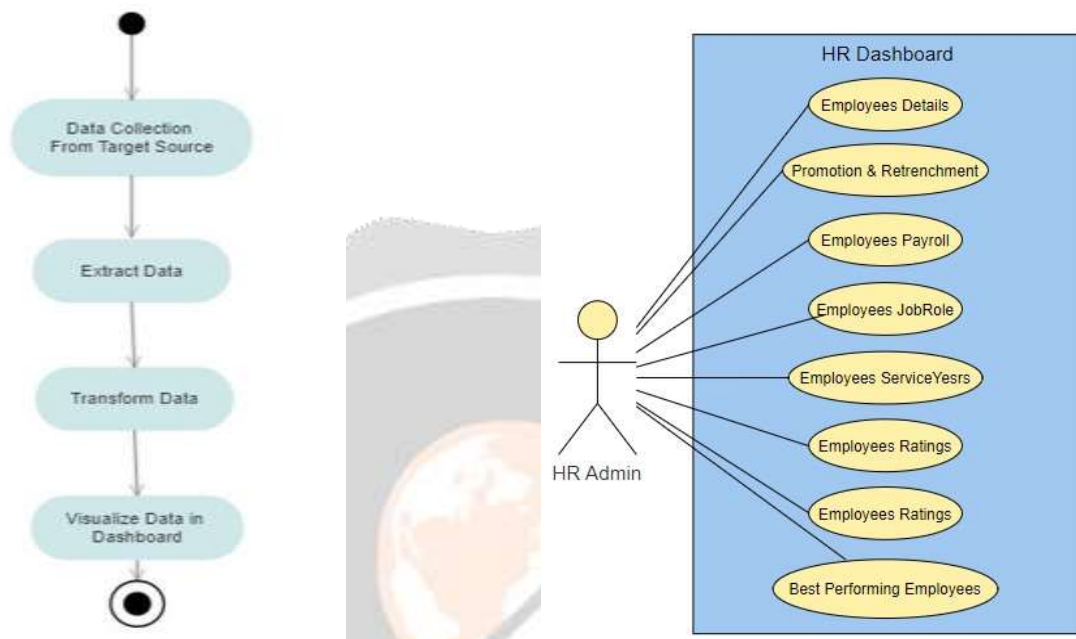

Fig. Activity diagram   **Fig. Use Case Diagram**

Descriptive Research Design

Descriptive research seeks to describe the current status of Tan identified variable. These research projects are designed to provide systematic information about a phenomenon. The researcher does not usually begin with a hypothesis, but is likely to develop one after collecting data. The analysis and synthesis of T the data provide the test of the hypothesis.
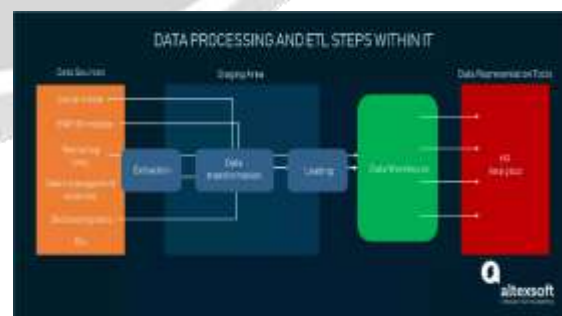
Data Collection Technique

I will include data collection technique a s interviews, observations (direct and participant), questionnaires, past records, and relevant documents. The use of multiple data collection techniques and sources strengthens the credibility of T outcomes and enables different interpretations and meanings to be included in data analysis.

CONCLUSION

HR analytics quantifies and provides data-driven decision making by using statistical models and techniques. HR analytics handles all relevant data related to HR and interpret better result. HR analytics has been helping businesses in gaining competitive advantage, solving HR related problems, improving organizational performance, and has improved HR function. Knowledge and skill gap can be filled by learning and adopting certain knowledge and skills. Data can be used and maintained ethically and legally if the organization follows relevant policies and norms. The study explains that HR analytics usage and implementation have both pros and cons but if analyzed on a broader concept then opportunities of using HR analytics diminishes the challenges and lead to tremendous growth of the organization. It is analyzed that if an organization understands the right purpose of implementing HR analytics than they can get a better return on investment and businesses will accept and start involving HR analytics in HR departments. Soon HR analytics usage will rise and help the organization in getting evidence-based results and will transform the working of HR department from traditional to statistical decision making. The right use of HR analytics at the right time and in the right business can lead to tremendous growth of HR analytics in an organization providing them to grow faster.

REFERENCES:

[1] Sujeet Narendra Mishra, Dev Raghavendra Lama, shri Rama Swaroop, "A Decision Making Model for Human Resource Management in Organizations using data mining and predictive analytics", International Journal of Computer Science and Information Security (IJCSIS), Vol 14, No. 5, May 2016.

[2] Abdulquddus Mohammed, "HR ANALYTICS: A modern tool in hr. for predictive decision making", Journal of Management · May 2019

[3] Alao D & Adeyemo A.B "Analyzing employee attrition using decision tree algorithm"s" Computing, Information Systems & Development Informatics Vol. 4 No. 1 March, 2013

[4] Chib, S. (2019), "Monograph on HR reporting using using HR dashboards", International Journal of Scientific and Research Publications.

[5] Gurusinghe, N, Arachchige, B.J.H. and Dayarathna, D. (2019), Identified Research Gaps in HR Analytics, Conference: Challenges to Humankind in the Face of New Technologies at Colombo, Sri Lanka. 6. Jabir, B., Falih, N. and Rahmani, K. (2019)

[6] Momin, W.Y.M. and Mishra, K. (2016), "HR analytics: Re-inventing human resource management", International Journal of Applied Research, Vol. 2, No. 5, pp. 785-790. 15. Opatha, H.H.D.N.P. (2009).

[7] Jabir, B., Falih, N. and Rahmani, K. (2019), "HR analytics a roadmap for decision making: case study", Indonesian Journal of Electrical Engineering and Computer Science, Vol. 15, No. 2, pp. 979-990.

[8] Reddy, P.R. and Lakshmikeerthi, P. (2017), ""HR Analytics" - An Effective Evidence Based HRM Tool", International Journal of Business and Management Invention, Vol. 6, No. 7, pp. 23-34

[9] Reena, R, Ansari, M.M.K. and Jayakrishnan, S.S. (2019), "Emerging trends in human resource analytics in upcoming decade", International Journal of Engineering Applied Sciences and Technology, Vol. 4, No. 8, pp. 260-264

[10] Momin, W.Y.M. and Mishra, K. (2016), "HR analytics: Re-inventing human resource management", International Journal of Applied Research, Vol. 2, No. 5, pp. 785-790