Employee Data Analysis using Excel

STUDENT NAME: D.Dhanalakshmi
REGISTER NO: asunm221122201032 (21)
DEPARTMENT: commerce
COLLEGE: TMG college

PROJECT TITLE

IBM HR ANALYTICS EMPLOYEE ATTRITION AND PERFORMANCE

AGENDA

1.Problem Statement
2.Project Overview
3.End Users
4.Our Solution and Proposition
5.Dataset Description
6.Modelling Approach
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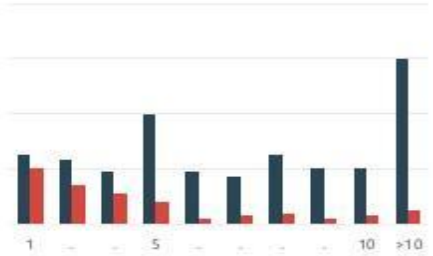
PROBLEM STATEMENT

Human Resources are critical resources of any organization. Organizations spend huge amount of time and money to hire and nurture their employees. It is a huge loss for companies if employees leave, especially the key resources.

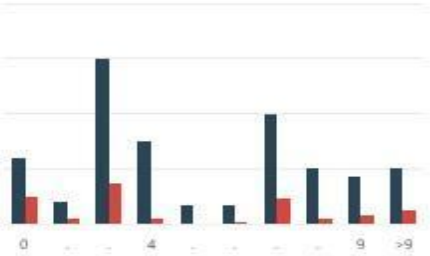
HR Employee Attrition Analysis Dashboard

This graph/chart is linked to excel, and changes automatically based on data. Just left click on it and select "Edit Data".

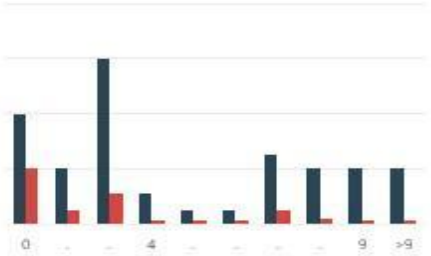
Attrition Share by Time Dimension



Year with Company



Year in Current Role



Year with Current Manager

Employee Attrition

Attrition Head Count & Percentage

Attrition Age Distribution By Gender

Female

Male

Total
771

Total
477

Attrition by Job Role

PROJECT OVERVIEW

HR analytics is the gathering, analyzing and reporting of data that surrounds the management of human resources. It is the method of getting a better understanding of the people within an organization and how well the human resources team is performing.

WHO ARE THE END USERS?

IBM's HR Analytics for employee end users typically involves tools and processes designed to help organizations manage and optimize their workforce. Here's a brief overview:

1. **Employee Engagement:** Tools to gauge and improve employee satisfaction and engagement levels.
2. **Performance Metrics:** Analytics to monitor and enhance employee performance and productivity.
3. **Attrition Analysis**: Insights into employee turnover trends and retention strategies.
4. **Talent Management:** Identifying high-potential employees and managing career development.
5. **Workforce Planning:** Analyzing workforce data to align with organizational goals and future needs.

These analytics can help HR professionals make data-driven decisions, improve employee experience, and align HR strategies with business objectives.

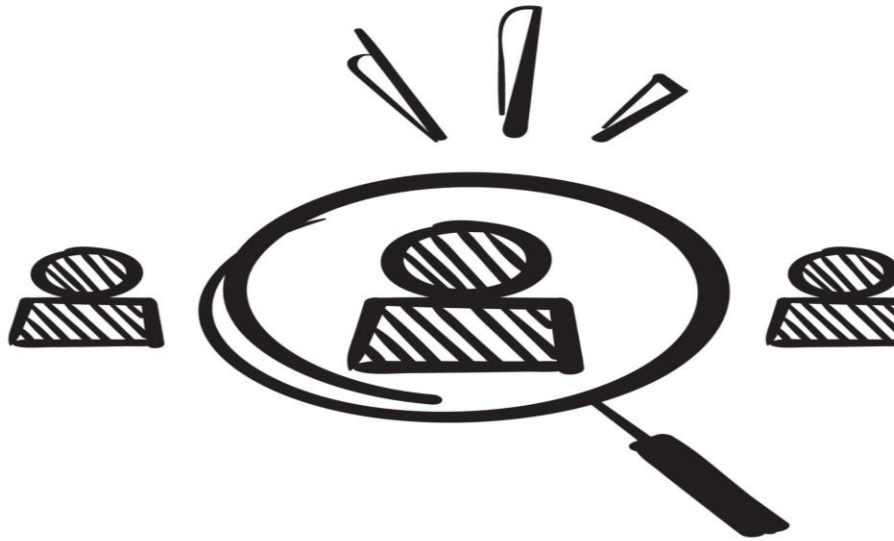
OUR SOLUTION AND ITS VALUE PROPOSITION

IBM HR Analytics for employees focuses on leveraging data to improve human resources processes and drive better business outcomes. The core value proposition of IBM HR Analytics includes:

1. **Data-Driven Insights**: IBM HR Analytics provides actionable insights by analyzing employee data, which helps in making informed decisions about talent management, recruitment, and retention.
2. **Predictive Analytics**: By using advanced algorithms, the solution can predict trends and potential issues, such as employee turnover, allowing HR to proactively address challenges.
3. **Improved Employee Experience**: Insights gained from analytics help in enhancing employee engagement and satisfaction by identifying factors that contribute to a positive work environment.
4. **Efficient Recruitment and Retention**: The solution aids in optimizing recruitment strategies by identifying the best-fit candidates and improving retention strategies by understanding what factors lead to employee attrition.
5. **Performance Management**: IBM HR Analytics helps in assessing employee performance and identifying areas for development, thus supporting better talent management and career growth initiatives.
6. **Cost Savings**: By streamlining HR processes and improving decision-making, organizations can achieve cost savings related to recruitment, training, and turnover.

Overall, IBM HR Analytics helps organizations transform their HR function from a reactive to a proactive and strategic role, ultimately driving better organizational performance and employee satisfaction.

Dataset description:



1. **Age:** The age of the employee.
2. **Attrition:** Indicates whether the employee has left the company (Yes/No)
3. **Education:** The level of education (e.g., Bachelor, Master, Doctorate).
4. **EducationField:** The field of education (e.g., Life Sciences, Marketing).
5. **EmployeeCount:** The number of employees in the company (usually constant at 1).
6. **EmployeeNumber:** A unique employee number.
7. **EnvironmentSatisfaction:** The satisfaction level with the work environment (1 to 4 scale).
8. **HourlyRate:** The hourly rate of pay.
9. **JobInvolvement:** The level of job involvement (1 to 4 scale).
10. **JobLevel:** The job level (1 to 5 scale)
11. **JobSatisfaction:** The satisfaction level with the job (1 to 4 scale).
12. **MaritalStatus:** Marital status of the employee (e.g., Single, Married).
13. **MonthlyIncome:** The monthly income of the employee
14. **OverTime:** Whether the employee works overtime (Yes/No).
15. **PercentSalaryHike:** The percentage increase in salary.
16. **PerformanceRating:** The rating of the employee's performance (1 to 4 scale).

Dataset:

Age	Attrition	Education	EducationField	EmployeeCount	EmployeeNumber	EnvironmentSatisfaction	Gender	HourlyRate	JobInvolvement	JobSatisfaction	MaritalStatus
41	Yes	2	Life Sciences	1	1	2	Female	94	3	4	Single
49	No	1	Life Sciences	1	2	3	Male	61	2	2	Married
37	Yes	2	Other	1	4	4	Male	92	2	3	Single
33	No	4	Life Sciences	1	5	4	Female	56	3	3	Married
27	No	1	Medical	1	7	1	Male	40	3	2	Married
32	No	2	Life Sciences	1	8	4	Male	79	3	4	Single
59	No	3	Medical	1	10	3	Female	81	4	1	Married
30	No	1	Life Sciences	1	11	4	Male	67	3	3	Divorced
38	No	3	Life Sciences	1	12	4	Male	44	2	3	Single
36	No	3	Medical	1	13	3	Male	94	3	3	Married
35	No	3	Medical	1	14	1	Male	84	4	2	Married
29	No	2	Life Sciences	1	15	4	Female	49	2	3	Single
31	No	1	Life Sciences	1	16	1	Male	31	3	3	Divorced
34	No	2	Medical	1	18	2	Male	93	3	4	Divorced
28	Yes	3	Life Sciences	1	19	3	Male	50	2	3	Single
29	No	4	Life Sciences	1	20	2	Female	51	4	1	Divorced
32	No	2	Life Sciences	1	21	1	Male	80	4	2	Divorced
22	No	2	Medical	1	22	4	Male	96	4	4	Divorced
53	No	4	Life Sciences	1	23	1	Female	78	2	4	Married
38	No	3	Life Sciences	1	24	4	Male	45	3	4	Single
24	No	2	Other	1	26	1	Female	96	4	3	Divorced
36	Yes	4	Life Sciences	1	27	3	Male	82	2	1	Single
34	No	4	Life Sciences	1	28	1	Female	53	3	2	Single
21	No	2	Life Sciences	1	30	3	Male	96	3	4	Single
34	Yes	1	Medical	1	31	2	Male	83	3	1	Single
53	No	3	Other	1	32	3	Female	58	3	3	Divorced
32	Yes	1	Life Sciences	1	33	2	Female	72	1	1	Single
42	No	4	Marketing	1	35	3	Male	48	3	2	Married
44	No	4	Medical	1	36	1	Female	42	2	4	Married
46	No	4	Marketing	1	38	2	Female	83	3	1	Single
33	No	3	Medical	1	39	3	Male	78	3	4	Single
44	No	4	Other	1	40	4	Male	41	3	4	Married
30	No	2	Medical	1	41	4	Male	83	2	3	Single
39	Yes	3	Technical Degree	1	42	4	Male	56	3	4	Married
24	Yes	3	Medical	1	45	2	Male	61	3	4	Married
43	No	2	Medical	1	46	4	Female	72	4	3	Divorced
50	Yes	2	Marketing	1	47	1	Male	86	2	3	Married
35	No	3	Marketing	1	49	4	Female	97	3	4	Married
36	No	4	Life Sciences	1	51	2	Female	82	2	1	Married
33	No	3	Life Sciences	1	52	3	Female	42	4	1	Married
35	No	2	Other	1	53	3	Male	75	3	4	Divorced
27	No	4	Life Sciences	1	54	4	Female	33	3	1	Divorced
26	Yes	3	Life Sciences	1	55	1	Male	48	1	3	Single
27	No	3	Life Sciences	1	56	4	Male	37	3	3	Single
30	No	2	Medical	1	57	3	Female	58	3	4	Single
41	Yes	3	Technical Degree	1	58	2	Female	49	3	3	Married

THE "WOW" IN OUR SOLUTION

IBM's HR Analytics solutions for employee attrition and performance focus on leveraging data to improve workforce management. The "wow" factor in these solutions often includes:

1. **Predictive Analytics:** Advanced algorithms forecast potential employee turnover, allowing organizations to proactively address issues before they lead to attrition.
2. **Real-time Insights:** Continuous monitoring and analysis provide up-to-date insights into employee performance and satisfaction, helping HR teams make informed decisions.
3. **Customized Recommendations:** Tailored suggestions for improving employee engagement and performance based on data-driven insights.
4. **Integrated Data Sources:** Combining data from various sources (e.g., performance reviews, surveys, and HR systems) to create a comprehensive view of employee dynamics.
5. **Visual Analytics:** Interactive dashboards and visualizations make complex data more accessible and actionable for HR professionals.

These features help organizations optimize their workforce, reduce turnover, and enhance overall performance through informed decision-making.

MODELLING

IBM HR Analytics often focuses on using data-driven insights to understand and improve employee attrition and performance. Here's a high-level overview of how it might be approached:

1. **Data Collection**: Gather data from various sources such as employee records, performance reviews, surveys, and external factors. This data might include employee demographics, job roles, tenure, salary, performance metrics, and reasons for leaving.
2. **Data Preparation**: Clean and preprocess the data to handle missing values, remove duplicates, and ensure consistency. This may involve normalizing data and encoding categorical variables.
3. **Exploratory Data Analysis (EDA)**: Analyze the data to identify patterns, correlations, and trends. This step involves visualizing data through charts and graphs to understand factors influencing attrition and performance.
4. **Attrition Modelling**: Use statistical models or machine learning algorithms to predict employee turnover. Techniques might include logistic regression, decision trees, random forests, or more advanced methods like gradient boosting and neural networks. The goal is to identify high-risk employees and the factors contributing to their likelihood of leaving.
5. **Performance Modelling**: Analyze performance data to understand what drives high performance and identify areas for improvement. Models can include regression analysis to link performance metrics with various factors like job satisfaction, compensation, and work environment.
6. **Insight Generation**: Translate model results into actionable insights. For instance, if high turnover is linked to low job satisfaction, HR might focus on improving workplace culture or compensation.
7. **Intervention Strategies**: Develop strategies based on insights, such as targeted retention programs, personalized development plans, or changes in management practices to enhance employee performance and reduce attrition.

IBM's Watson Analytics and other tools can facilitate these processes by providing advanced analytical capabilities, data visualization, and predictive modelling.

conclusion

In analyzing employee attrition and performance with IBM's HR Analytics, several conclusions can typically be drawn:

1.Key Drivers of Attrition: Identifying factors such as job satisfaction, compensation, work-life balance, and career development opportunities helps in understanding why employees leave. High attrition rates might be associated with certain departments, job roles, or demographic groups.

2.Performance Correlation: There's often a correlation between employee performance and various factors like tenure, job role, and engagement levels. High performers might have different needs or challenges compared to low performers, affecting their retention.

3.Predictive Modeling: Using predictive analytics, organizations can forecast potential attrition and performance issues, allowing for proactive measures. For example, if the model indicates that employees with certain characteristics are more likely to leave, targeted retention strategies can be implemented.

4.Impact of Interventions: Analyzing the effectiveness of HR interventions, such as training programs or changes in policies, can provide insights into what works best for improving employee satisfaction and performance.

5.Strategic Recommendations: Based on the data, HR can develop strategies to improve retention and performance, such as enhancing employee engagement initiatives, revising compensation structures, or offering career development opportunities.

Overall, leveraging HR analytics for attrition and performance helps organizations make data-driven decisions to improve workforce stability and productivity.