

Report On

HR Analytics Dashboard using Power BI

Submitted in partial fulfillment of the requirements of the Course project in
Semester VII of Final Year Artificial Intelligence and Data Science

by

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(2023-24)

Vidyavardhini's College of Engineering & Technology
Department of Artificial Intelligence and Data Science

CERTIFICATE

This is to certify that the project entitled “HR Analytics Dashboard Using Power BI” is a bonafide work of" Sanil Gokarn (Roll No. 33), Prachi Kadam (Roll No. 34), Sanskar Tawre (Roll No. 38)" submitted to the University of Mumbai in partial fulfillment of the requirement for the Course project in semester VII of Final Year Artificial Intelligence and Data Science engineering.

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Abstract

This comprehensive research project utilizes Power BI as a robust tool to dissect the intricate fabric of employee attrition within the organization. Through an exhaustive analysis of diverse datasets, we meticulously identify the multifaceted factors contributing to attrition, ranging from demographic variables to job satisfaction indicators. The resultant insights fuel the creation of targeted, data-driven retention strategies tailored to specific employee segments. By incorporating cutting-edge predictive analytics and seamlessly integrating with existing HR systems, our approach transcends mere analysis, transitioning into a proactive, adaptive methodology. This initiative marks a paradigm shift, illuminating the transformative potential of harnessing big data for HR purposes. The findings not only empower strategic decision-making but also lay the foundation for nurturing a resilient and engaged workforce, thereby ensuring sustained organizational success in the ever-evolving corporate landscape.

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Chapter # 1

1.1 Problem Statement:

The problem at hand revolves around the pressing issue of employee attrition within the organization. High turnover rates not only disrupt workflow but also impact productivity, team dynamics, and overall morale. The challenge lies in understanding the intricate web of factors leading to attrition, encompassing diverse variables such as job satisfaction, work-life balance, and career growth opportunities. This lack of retention not only incurs substantial costs but also hampers the organization's ability to maintain a stable and motivated workforce. To address this problem effectively, our project aims to delve deep into the underlying causes of attrition, utilizing advanced data analytics powered by Power BI. By identifying these key factors, we intend to develop tailored strategies that enhance employee satisfaction, improve retention rates, and create a workplace conducive to long-term employee commitment and organizational success.

Chapter # 2

2.1 Description and Working:

This project involves the implementation of an HR analytics dashboard using Power BI, a powerful business analytics tool by Microsoft. The primary objective is to analyze and address the issue of employee attrition within the organization. By integrating various data sources, including employee records, surveys, and performance data, the project aims to identify patterns and factors contributing to attrition. Through data visualization and analysis, the project seeks to gain valuable insights into employee behavior, job satisfaction, and other pertinent factors affecting retention. The ultimate goal is to develop data-driven strategies that enhance employee engagement, reduce attrition rates, and foster a positive work environment.

Working:

1. **Data Collection and Integration:**
Gather data from multiple sources such as employee databases, surveys, and performance records. Integrate this data into a unified dataset for analysis.
2. **Data Cleaning and Transformation:**
Cleanse the data by removing inconsistencies and inaccuracies. Transform the data into a format suitable for analysis, ensuring data quality and consistency.
3. **Data Analysis and Visualization:**
Utilize Power BI's features to create visually appealing charts, graphs, and dashboards. Analyze attrition trends, demographic patterns, and correlations among various factors contributing to attrition.
4. **Identifying Key Factors:**
Use statistical methods and machine learning algorithms to identify key factors leading to attrition, such as job satisfaction levels, work-life balance, performance ratings, and career growth opportunities.
5. **Developing Retention Strategies:**
Based on the insights gained, formulate targeted retention strategies. These may include personalized training programs, mentorship initiatives, flexible work arrangements, and benefits enhancements.

6. **Dashboard Implementation:**
Design and implement an interactive HR analytics dashboard using Power BI. The dashboard should provide real-time insights and allow users to explore data dynamically.
7. **Continuous Monitoring and Optimization:**
Implement mechanisms for continuous data monitoring. Regularly update the dashboard to reflect the most recent data. Monitor the effectiveness of implemented strategies and optimize them based on ongoing feedback and results.
8. **Documentation and Reporting:**
Document the analysis methods, findings, and implemented strategies. Prepare detailed reports and presentations to communicate the insights and recommendations to stakeholders and management.

By following these steps, the project aims to create a comprehensive HR analytics solution that not only identifies attrition factors but also empowers the organization to take proactive measures, ensuring a motivated and engaged workforce.

2.2 Software & Hardware used:

Software:

- Power BI
- Windows 10 OS

Hardware:

- 64-bit Operating System
- 6gb RAM
- Intel i5 processor

Chapter # 3

3.1 Dataset:

File Home Help Table tools

Name: HR_Analytics (2)

Structure: Mark as date table, Calendars, Manage relationships, Relationships, New measure, Quick measure, New column, New table, Calculations

Table: HR_Analytics (2) (1,470 rows)

EmpID	Age	AgeGroup	Attrition	BusinessTravel	DailyRate	Department	DistanceFromHome	Education	EducationField	EmployeeCount	EmployeeNumber	Env
RM150	19	18-25	No	Travel_Rarely	1181	Research & Development	3	1	Medical	1	201	
RM423	19	18-25	Yes	Travel_Rarely	489	Human Resources	2	2	Technical Degree	1	566	
RM689	19	18-25	Yes	Travel_Rarely	419	Sales	21	3	Other	1	959	
RM910	19	18-25	No	Travel_Rarely	265	Research & Development	25	3	Life Sciences	1	1269	
RM488	20	18-25	No	Travel_Rarely	959	Research & Development	1	3	Life Sciences	1	657	
RM690	20	18-25	Yes	Travel_Rarely	129	Research & Development	4	3	Technical Degree	1	960	
RM732	20	18-25	Yes	Travel_Rarely	1097	Research & Development	11	3	Medical	1	1016	
RM371	21	18-25	Yes	Travel_Rarely	156	Sales	12	3	Life Sciences	1	494	
RM664	21	18-25	Yes	Travel_Rarely	1427	Research & Development	18	1	Other	1	923	
RM018	22	18-25	No	Non-Travel	7123	Research & Development	16	2	Medical	1	22	
RM1274	22	18-25	Yes	Travel_Rarely	1294	Research & Development	8	1	Medical	1	1783	
RM587	24	18-25	No	Non-Travel	1092	Research & Development	9	3	Life Sciences	1	812	
RM872	24	18-25	Yes	Travel_Rarely	984	Research & Development	17	2	Life Sciences	1	1219	
RM1062	24	18-25	No	Non-Travel	830	Sales	13	2	Life Sciences	1	1495	
RM1223	24	18-25	Yes	Travel_Rarely	240	Human Resources	22	1	Human Resources	1	1714	
RM684	25	18-25	Yes	Travel_Rarely	867	Sales	19	2	Marketing	1	952	
RM043	26	26-35	Yes	Travel_Rarely	1357	Research & Development	25	3	Life Sciences	1	55	
RM464	26	26-35	Yes	Travel_Rarely	471	Research & Development	24	3	Technical Degree	1	622	
RM042	27	26-35	No	Travel_Rarely	1240	Research & Development	2	4	Life Sciences	1	54	
RM971	27	26-35	No	Travel_Rarely	1291	Sales	11	3	Medical	1	1364	
RM1380	27	26-35	Yes	Travel_Frequently	1337	Human Resources	22	3	Human Resources	1	1944	
RM801	28	26-35	Yes	Travel_Frequently	1009	Research & Development	1	3	Medical	1	1111	
RM1070	28	26-35	No	Travel_Rarely	1423	Research & Development	1	3	Life Sciences	1	1506	
RM1338	28	26-35	No	Travel_Rarely	7172	Sales	3	3	Medical	1	1875	
RM547	29	26-35	No	Travel_Rarely	1396	Sales	10	3	Life Sciences	1	749	
RM590	29	26-35	Yes	Travel_Rarely	805	Research & Development	1	2	Life Sciences	1	816	
RM1105	29	26-35	No	Travel_Rarely	598	Research & Development	9	3	Life Sciences	1	1558	

Project2 [Read-Only] - Power BI Desktop - Last saved: Today at 11:01 PM

File Home Help Table tools

Name: HR_Analytics (2)

Structure: Mark as date table, Calendars, Manage relationships, Relationships, New measure, Quick measure, New column, New table, Calculations

Table: HR_Analytics (2) (1,470 rows)

EmpID	Age	AgeGroup	Attrition	BusinessTravel	DailyRate	Department	DistanceFromHome	Education	EducationField	EmployeeCount	EmployeeNumber	Env
RM711	33	26-35	No	Non-Travel	722	Sales	17	3	Life Sciences	1	992	
RM1096	33	26-35	No	Travel_Rarely	589	Research & Development	28	4	Life Sciences	1	1549	
RM1211	33	26-35	No	Travel_Rarely	267	Research & Development	21	3	Medical	1	1698	
RM104	34	26-35	No	Travel_Rarely	665	Research & Development	6	4	Other	1	138	
RM203	34	26-35	No	Travel_Frequently	878	Research & Development	10	4	Medical	1	277	
RM463	34	26-35	No	Travel_Rarely	258	Sales	21	4	Life Sciences	1	621	
RM504	34	26-35	No	Travel_Rarely	1397	Research & Development	1	5	Life Sciences	1	683	
RM525	34	26-35	No	Travel_Rarely	1442	Research & Development	9	3	Medical	1	717	
RM965	34	26-35	No	Travel_Rarely	507	Sales	15	2	Medical	1	1356	
RM984	34	26-35	No	Travel_Rarely	404	Research & Development	2	4	Technical Degree	1	1383	
RM1040	34	26-35	Yes	Travel_Rarely	1107	Human Resources	9	4	Technical Degree	1	1467	
RM1085	34	26-35	No	Travel_Rarely	971	Sales	1	3	Technical Degree	1	1535	
RM1132	34	26-35	No	Travel_Frequently	653	Research & Development	10	4	Technical Degree	1	1597	
RM1147	34	26-35	No	Travel_Frequently	426	Research & Development	10	4	Life Sciences	1	1615	
RM1180	34	26-35	No	Travel_Rarely	1130	Research & Development	3	3	Life Sciences	1	1658	
RM1209	34	26-35	No	Travel_Rarely	1157	Research & Development	3	2	Medical	1	1696	
RM1213	34	26-35	No	Travel_Rarely	678	Research & Development	19	3	Life Sciences	1	1701	
RM1369	34	26-35	No	Travel_Frequently	735	Research & Development	22	4	Other	1	1932	
RM038	35	26-35	No	Travel_Rarely	890	Sales	2	3	Marketing	1	49	
RM509	35	26-35	No	Travel_Rarely	1017	Research & Development	6	4	Life Sciences	1	691	
RM637	35	26-35	Yes	Travel_Frequently	130	Research & Development	25	4	Life Sciences	1	881	
RM730	35	26-35	No	Travel_Rarely	583	Research & Development	25	4	Medical	1	1014	
RM849	35	26-35	No	Travel_Frequently	636	Research & Development	4	4	Other	1	1185	
RM1082	35	26-35	No	Travel_Rarely	1029	Research & Development	16	3	Life Sciences	1	1529	
RM1131	35	26-35	No	Travel_Rarely	750	Research & Development	28	3	Life Sciences	1	1596	
RM1158	35	26-35	No	Non-Travel	208	Research & Development	8	4	Life Sciences	1	1620	
RM1282	35	26-35	Yes	Travel_Rarely	303	Sales	27	3	Life Sciences	1	1797	

FileHomeHelp

Clipboard

Get data
Excel workbook
OneLake data hub
SQL Server data
Dataaverse recent sources

Transform Refresh data
Queries

Manage relationships
Relationships

New measure column
Calculations

New table
New table

Manage roles
Security

View as
Security

Q&A setup
Q&A

Language
Q&A

Linguistic schema
Q&A

Sensitivity
Sensitivity

Publish
Share

HR_Analytics (2)

Σ Age

AgeGroup

Attrition

Σ AttritionCount

BusinessTravel

Σ DailyRate

Department

Σ DistanceFromHome

Education

Collapse ^

Properties

Data

Search

HR_Analytics (2)

Σ Age

AgeGroup

Attrition

Σ AttritionCount

AttritionRate

BusinessTravel

Σ DailyRate

Department

Σ DistanceFromHome

Education

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EmpID

Σ EmployeeCount

Σ EmployeeNumber

Σ EnvironmentSatisfaction

Gender

Σ HourlyRate

Σ JobInvolvement

JobLevel

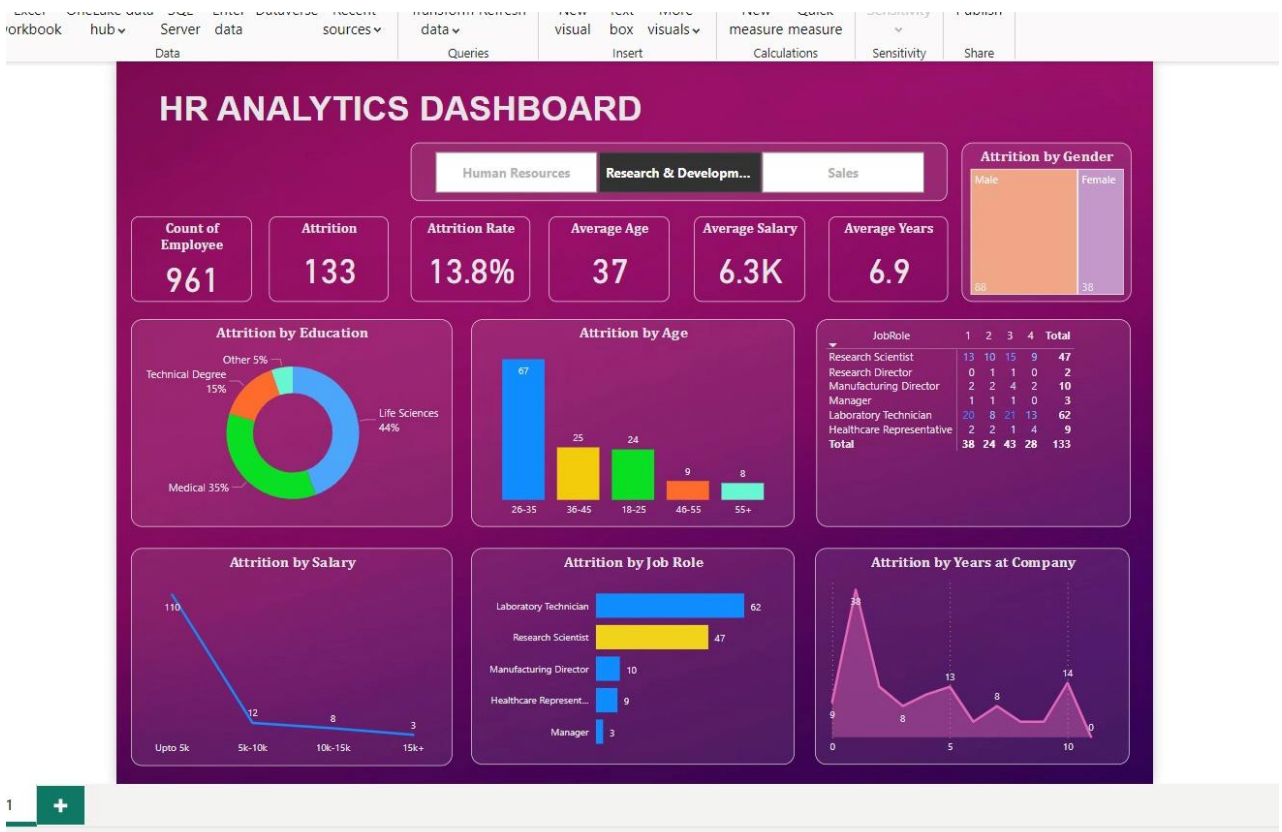
JobRole

Σ JobSatisfaction

MaritalStatus

All tables +

3.2 Result:



HR ANALYTICS DASHBOARD

Human Resources

Research & Developm...

Sales

Count of
Employee
446

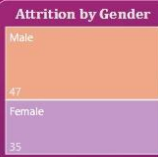
Attrition
92

Attrition Rate
20.6%

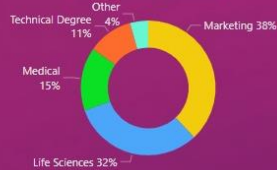
Average Age
37

Average Salary
7.0K

Average Years
7.3



Attrition by Education

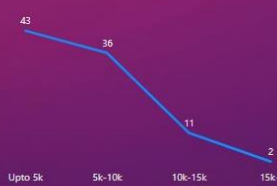


Attrition by Age



JobRole	1	2	3	4	Total
Sales Representative	7	10	9	7	33
Sales Executive	16	9	18	14	57
Manager	0	1	0	1	2
Total	23	20	27	22	92

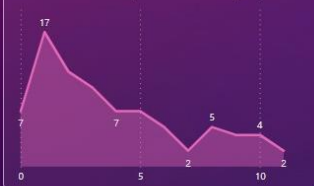
Attrition by Salary



Attrition by Job Role



Attrition by Years at Company



ge 1

HR ANALYTICS DASHBOARD

Human Resources

Research & Developm...

Sales

Count of
Employee
159

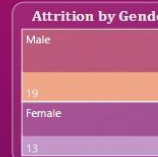
Attrition
35

Attrition Rate
22.0%

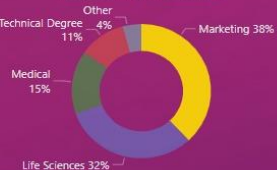
Average Age
38

Average Salary
7.3K

Average Years
7.6



Attrition by Education



Attrition by Age



JobRole	1	2	3	4	Total
Sales Representative	2	5	4	1	12
Sales Executive	5	3	7	6	21
Manager	0	1	0	1	2
Total	7	9	11	8	35

Attrition by Salary



Attrition by Job Role



Attrition by Years at Company



1

HR ANALYTICS DASHBOARD

Human Resources

Research & Developm...

Sales

Count of Employee
150

Attrition
29

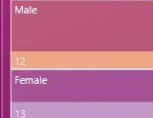
Attrition Rate
19.3%

Average Age
37

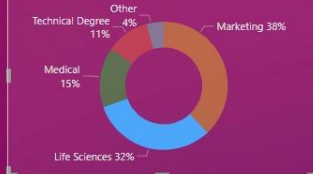
Average Salary
7.2K

Average Years
7.5

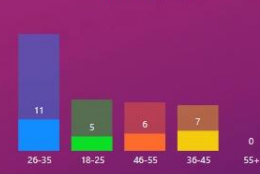
Attrition by Gender



Attrition by Education



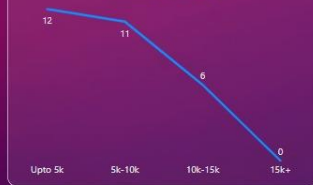
Attrition by Age



Job Role

JobRole	1	2	3	4	Total
Sales Representative	3	2	1	3	9
Sales Executive	6	4	7	3	20
Manager	0	0	0	0	0
Total	9	6	8	6	29

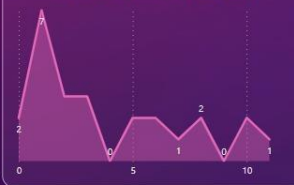
Attrition by Salary



Attrition by Job Role



Attrition by Years at Company



3.3 CONCLUSION AND FUTURE SCOPE:

In conclusion, the successful implementation of the HR analytics dashboard using Power BI has provided us with profound insights into the factors driving employee attrition. Through rigorous data analysis, we've identified key patterns, enabling the formulation of targeted retention strategies. This data-driven approach not only enhances our grasp of workforce dynamics but also lays the foundation for a more proactive and informed HR management, fostering a positive workplace culture.

Looking ahead, there are exciting prospects on the horizon. Integrating advanced machine learning algorithms promises enhanced predictive analytics, empowering us to anticipate attrition trends and take proactive measures. Expanding the dashboard to include additional HR metrics such as talent acquisition efficiency and diversity indices could provide a more comprehensive organizational view. Incorporating natural language processing (NLP) for sentiment analysis in employee feedback would deepen our understanding further. Real-time data integration and continuous feedback loops are avenues for future exploration, ensuring our strategies remain adaptive and effective. By embracing these advancements, our organization can continue fostering a data-informed, engaged, and thriving work environment.

Chapter # 4

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