

The background features a series of concentric circles in a light gray color, centered on the page. On the left side, there are three large geometric shapes: a blue parallelogram pointing downwards, a gray parallelogram pointing upwards, and an orange triangle pointing upwards.

TEAM VEGA

**PROJECT PRESENTATION ON
DATA-DRIVEN EMPLOYEE
PERFORMANCE AND RETENTION
PLATFORM FOR 10ALYTICS.**

DATE: JANUARY 2025

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INTRODUCTION

The data-driven employee performance and retention platform is designed to empower 10alytics with actionable insights to improve employee retention and optimize performance management.

Leveraging advanced data analytics and machine learning, the platform addresses pressing business challenges such as high attrition rates and declining employee performance. This initiative aims to shift HR operations from a reactive to a proactive approach, ultimately enhancing employee satisfaction and organizational success.

ABOUT THE TEAM

We are **Team Vega**, a dedicated and multidisciplinary team committed to transforming employee management at **10alytics** through the development of the **data-driven employee performance and retention platform**. Combining expertise in business analysis, agile/scrum project management, data analytics, machine learning, and human resources, our mission is to deliver a cutting-edge solution that empowers HR teams with actionable insights to reduce attrition, optimize performance, and foster employee satisfaction.

With a collaborative approach and a passion for innovation, Team Vega is here to drive meaningful change and support the company's growth objectives.



BACKGROUND

Employee turnover has far-reaching consequences, including increased recruitment costs, operational disruptions, and loss of institutional knowledge. Current HR practices at **10alytics** are largely reactive, addressing issues only after employees leave or performance deteriorates. This lack of foresight limits the company's ability to mitigate risks effectively.

The development of a predictive analytics platform will enable **10alytics** to gain deeper insights into employee behavior, forecast risks, and implement timely interventions, ensuring sustained organizational growth and employee well-being.

DATA COLLECTION AND PROCESSING



Data Sources:

The platform utilizes multiple data sources to ensure comprehensive insights, including:

- **Employee Records:** Tenure, job roles, salary progression, promotions, and department affiliations.
- **Performance Data:** Historical performance reviews, project evaluations, and departmental benchmarks.
- **Engagement Metrics:** Survey responses, feedback sessions, and employee Net Promoter Scores (eNPS).
- **Attrition Data:** Historical records of employee exits and associated reasons.

Preprocessing Steps:

- **Data Cleaning:** Address missing values, correct inconsistencies, and standardize formats for uniformity.
- **Feature Engineering:** Generate predictive variables such as engagement trends, promotion frequency, and cross-department interactions.
- **Data Transformation:** Normalize and encode categorical data for compatibility with machine learning models.
- **Integration:** Consolidate structured and unstructured data into a unified analytical dataset.

EXPLORATORY DATA ANALYSIS (EDA)

Key Insights Derived:

Attrition Trends: Departments with high workload intensity exhibited the highest turnover rates.

Correlation Analysis: Engagement levels and stagnated salary growth were strong predictors of attrition risk.

Performance Insights: Employees with declining performance scores often displayed early signs in engagement metrics.

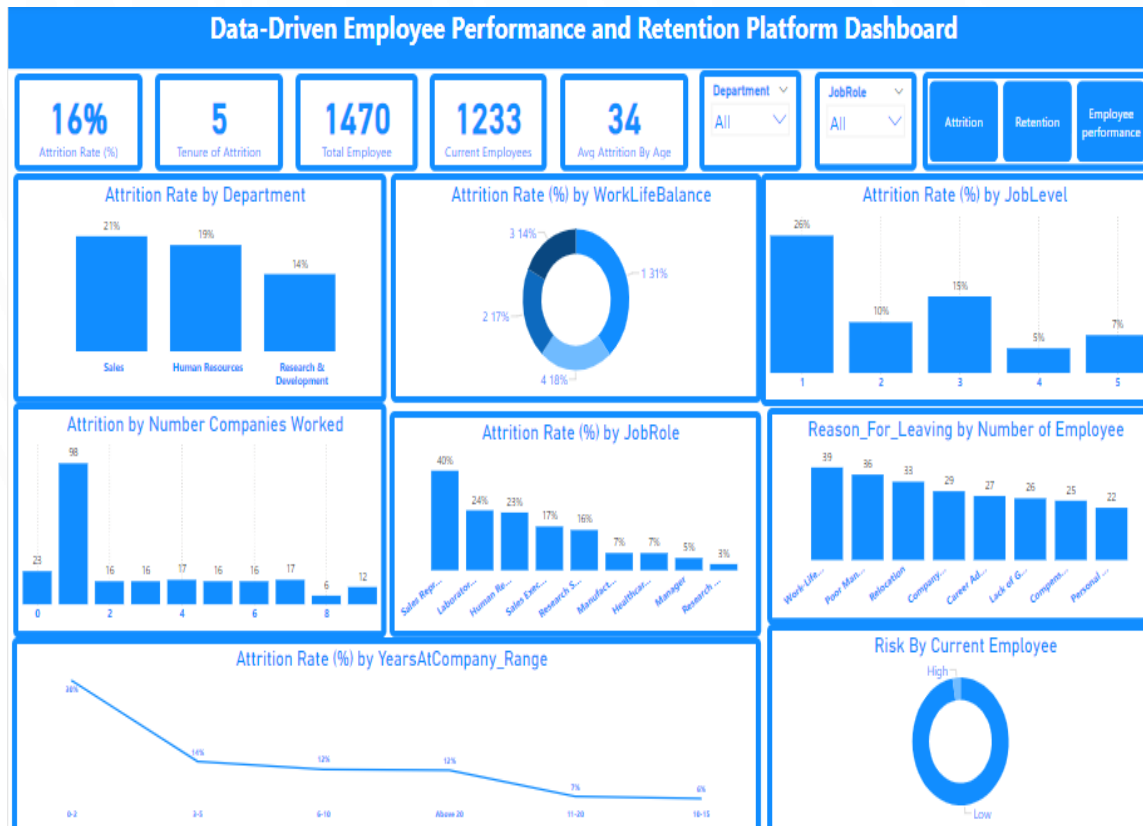
Visual Representations:

Attrition Heatmap: Visualizing turnover by department and tenure.

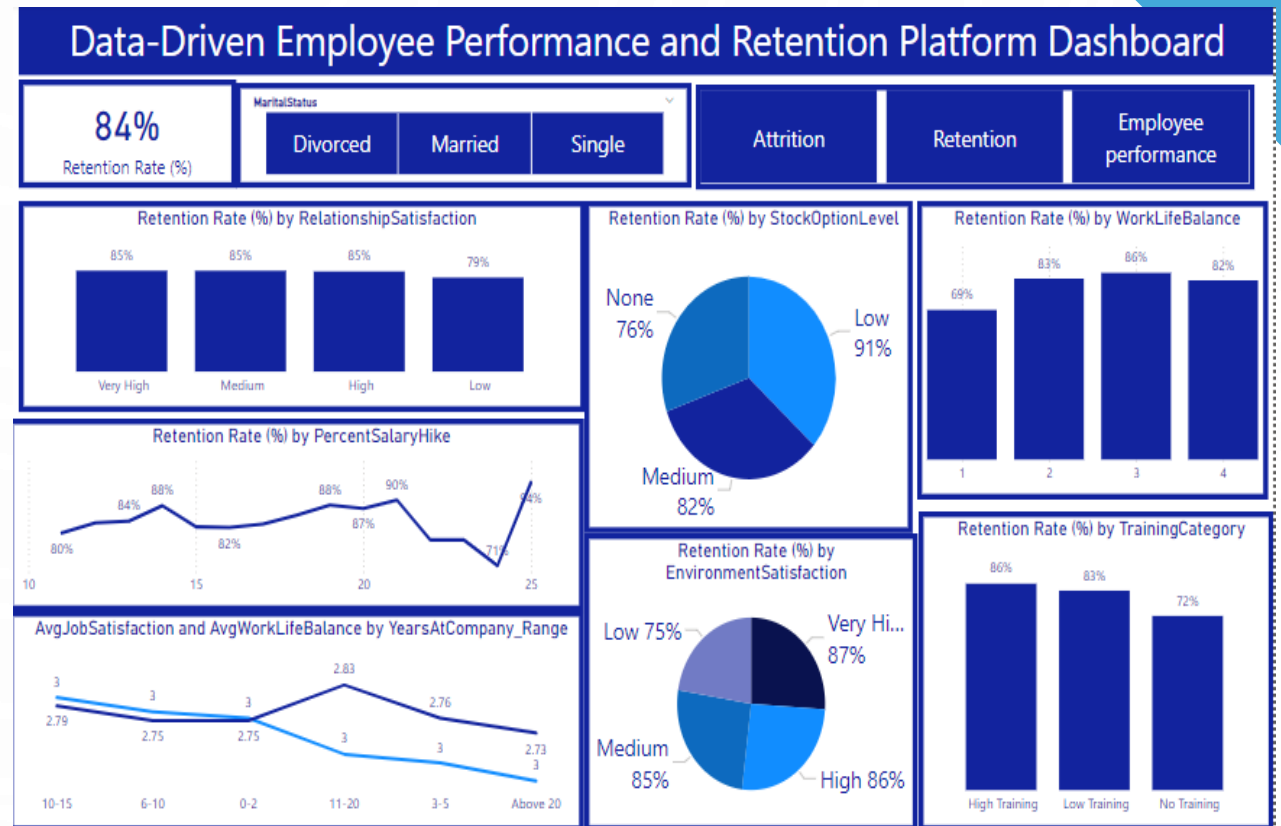
Correlation Matrix: Highlighting relationships between predictors (E.G., Salary growth and attrition risk).

Engagement Vs. Performance Scatterplot: Showing patterns of declining engagement correlating with performance dips.

VISUAL REPRESENTATIONS



Attrition Dashboard



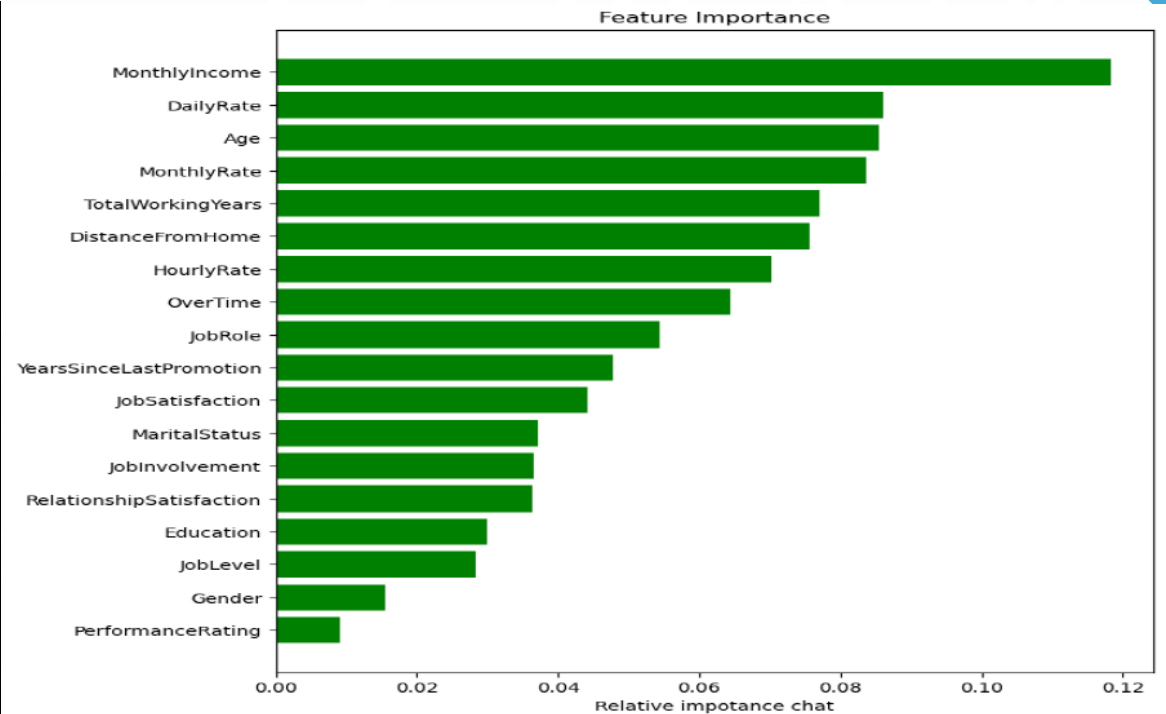
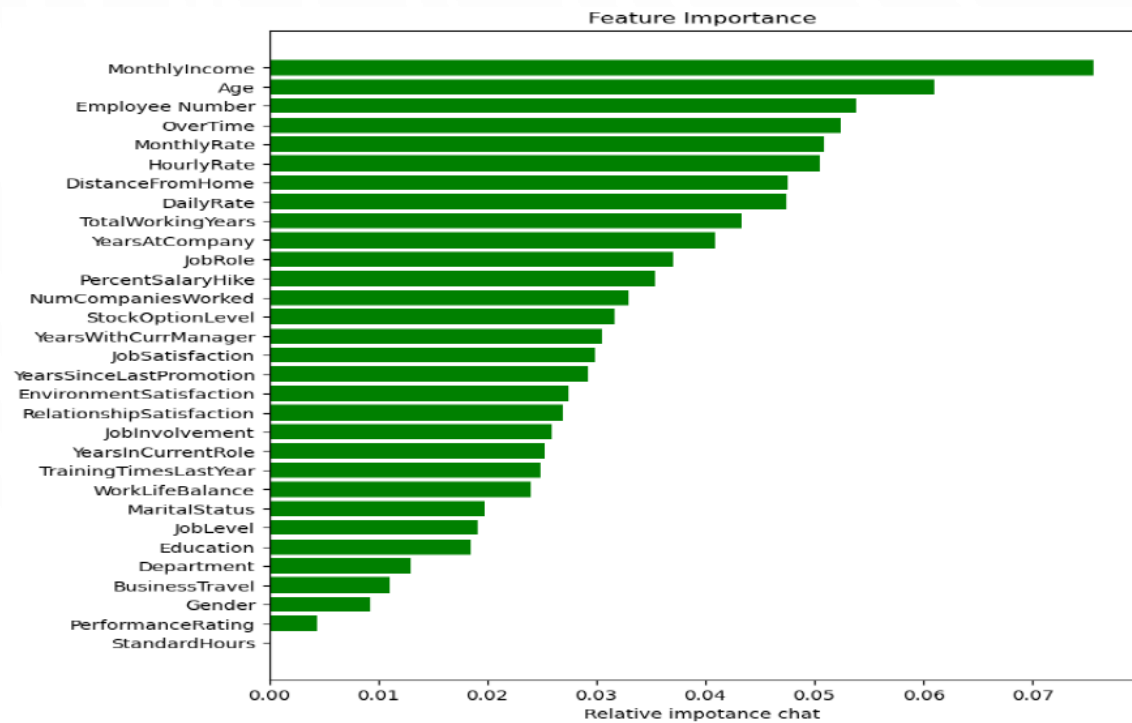
Retention Dashboard

VISUAL REPRESENTATION CONTD.



Performance Dashboard

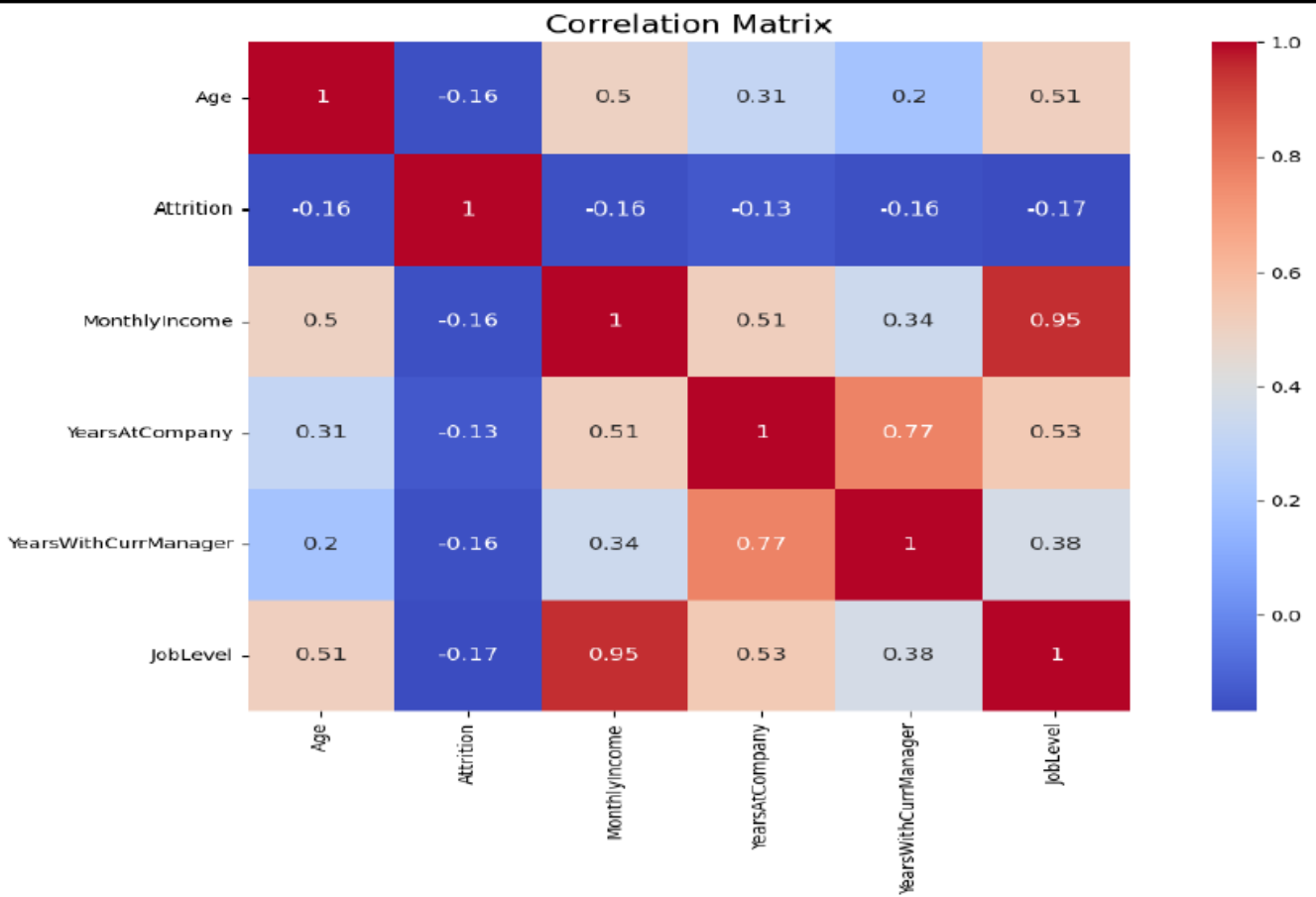
ORDER OF INFLUENCE ON ATTRITION & MODEL FEATURES



The analysis reveals that attrition is negatively correlated with the following factors:

- Age
- Monthly income
- Years in the company
- Years with the current manager
- Job level

This means that as these factors increase, the likelihood of attrition decreases. In other words, older employees, those with higher monthly income, longer tenure, longer time with their current manger, and higher job levels tend to have lower rate of attrition



CORRELATION MATRIX

The Platform Development Follows A Structured And Iterative Methodology

Analytical Methods:

Attrition Prediction: Logistic Regression, Random Forest, and Gradient Boosting to identify at-risk employees.

Performance Prediction: Time-series modeling (arima, lstm) to forecast individual and team performance trends.

Recommendation System: Collaborative filtering to generate personalized retention strategies.

Platform Development Tools:

Data Analytics: Python (pandas, numpy, scikit-learn), SQL for data querying.

Visualization: Tableau and Power BI for interactive dashboards.

Machine Learning: Tensorflow, Keras for predictive model training and evaluation.



METHODOLOGY

RESULT



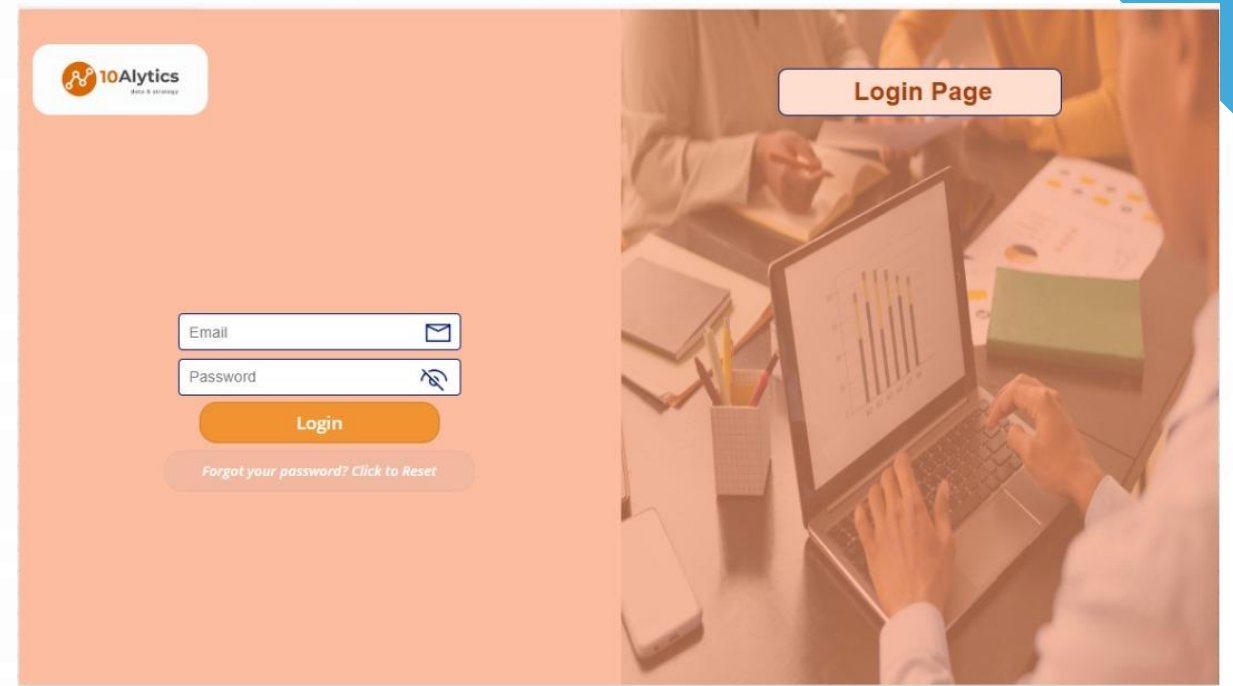
MODEL PERFORMANCE: The most suitable and selected model for the project is Logistic Regression. The Confusion Matrix for the Logistic Regression Model provides more insights after cross validation:-

- **False Negative (FN) rate: 2.27%** (i.e., 2.27% of actual attritors were misclassified as retainers)
- **True Positive (TP) rate: 70.5%** (i.e., 70.5% of actual attritors were correctly classified as attritors)
- **Average Recall for attrition (class 1): 70%**
- **Average Recall for retention (class 0): 71%**

Further work is being done to improve on the model performance.

DEVELOPMENT INTERFACES

(HOME & LOGIN PAGES)



DEVELOPMENT INTERFACE

(PASSWORD RESET & OTP VALIDATION PAGES)

Password Reset

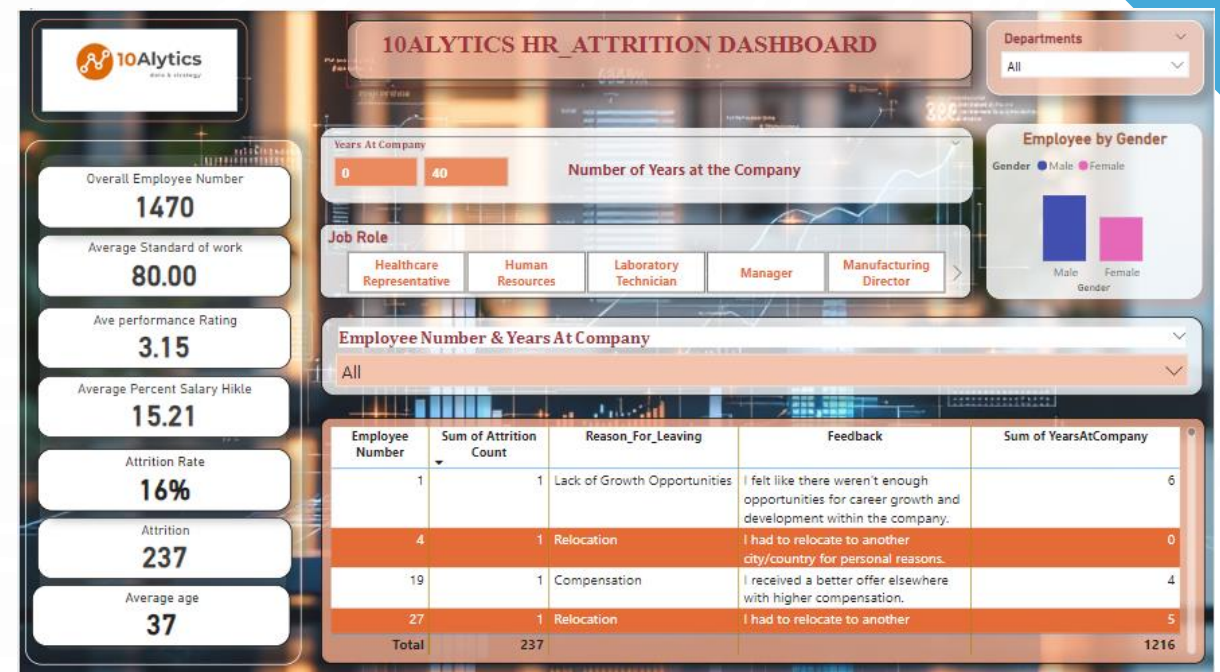
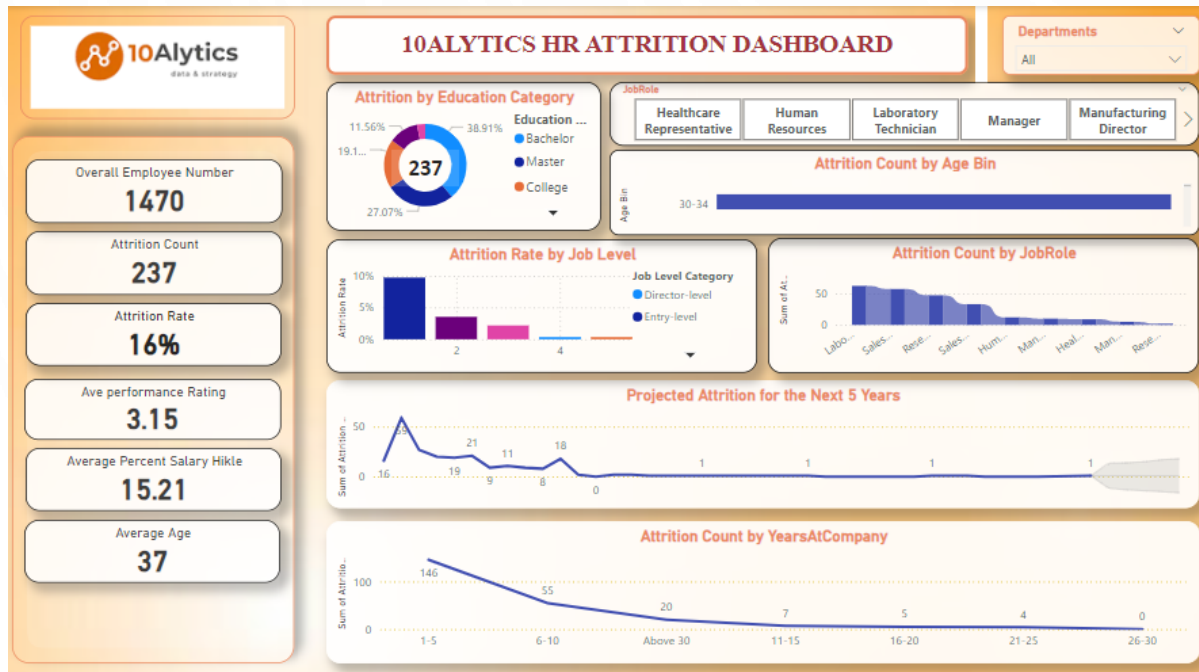
Enter New Password	<input type="password"/>
Confirm New Password	<input type="password"/>
<input type="button" value="Save"/>	

Hello, please validate your OTP (6 Digits) sent to your email

Enter your OTP	<input type="text"/>
<input type="button" value="Validate"/>	

DEVELOPMENT INTERFACE

(ATTRITION PAGES)



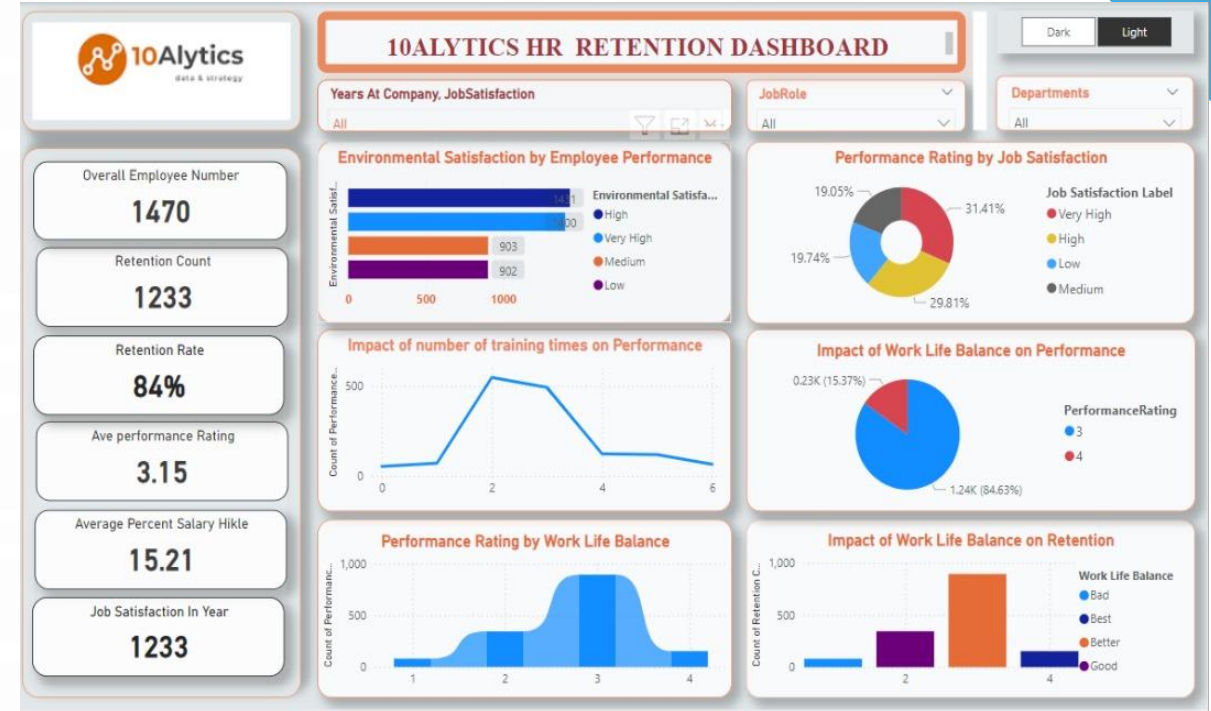
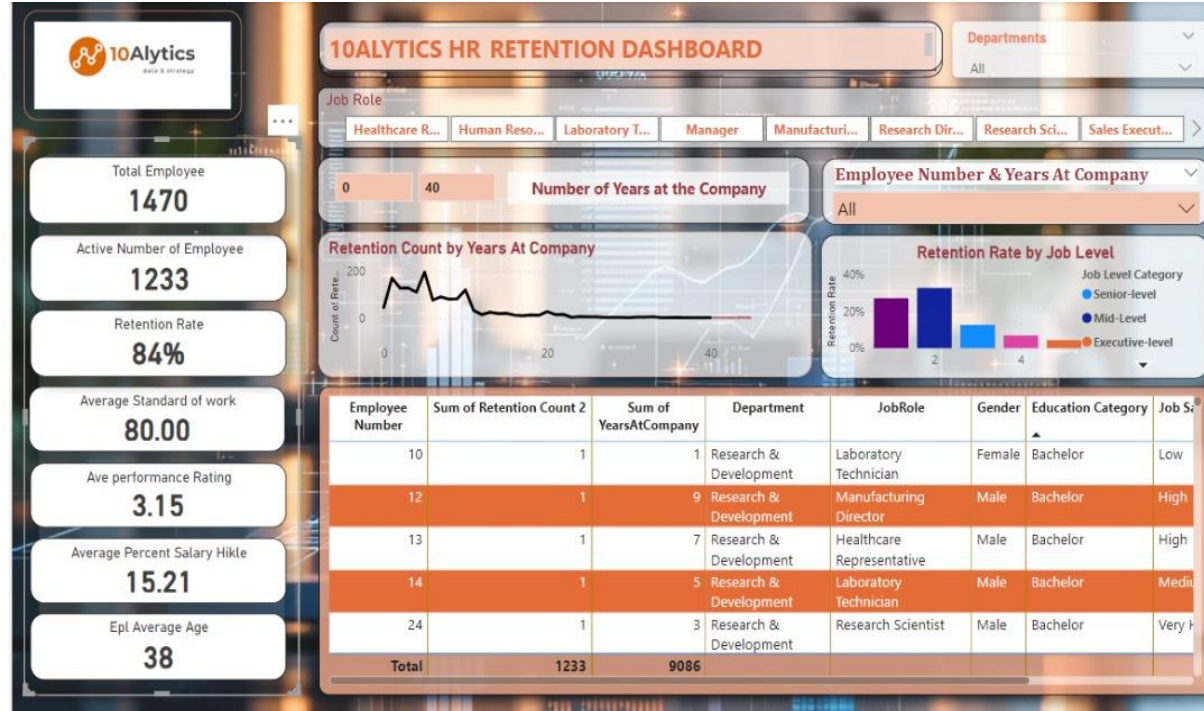
DEVELOPMENT INTERFACE

(ATTRITION RISK LEVEL PAGE)



DEVELOPMENT INTERFACE

(RETENTION PAGES)



DEVELOPMENT INTERFACE

(TURNOVER & CAUSES DASHBOARD)



DEVELOPMENT INTERFACE

(PERFORMANCE DASHBOARD)



DEVELOPMENT INTERFACE

(HR MANAGER PLATFORM – EMPLOYEE DETAILS)



DEVELOPMENT INTERFACE

(TOP & LEAST PERFORMING EMPLOYEES)


10Alytics
data & strategy

TOP AND LEAST PERFORMING EMPLOYEE

Employee's Job Role
Healthcare Repre...

Department
All

Top 6 Performing Employee

Employee Number	Attrition	Gender	Age	MaritalStatus	Department	MonthlyIncome	PerformanceRat
653	No	Male	31	Divorced	Sales	5460	4
714	No	Female	27	Divorced	Sales	4647	4
874	No	Male	44	Married	Research & Development	2818	4
1116	No	Male	48	Single	Research & Development	16885	4
1177	No	Male	26	Married	Research & Development	4420	4
2017	No	Female	37	Married	Research & Development	13744	4

Bottom 4 Performing Employee

Employee Number	Attrition	Gender	Sum of Age	MaritalStatus	Sum of Education	Department	Sum of MonthlyInco
1419	No	Male	29	Single	3	Human Resources	7988
837	No	Male	38	Divorced	3	Research & Development	6288
1019	No	Male	22	Married	1	Research & Development	2451
1961	No	Male	38	Single	3	Sales	2858

HR_Manager Desk
Select Employee Number to Open Form


DEVELOPMENT INTERFACE

(EMPLOYEE DRILL DOWN INSIGHT)



DEVELOPMENT INTERFACE

(HR MGR UPLOAD & MODIFY PAGES)



Employee Details

Employee's Job Role
Laboratory Techn...

Department
All

Search Field

Employee Number	Count of Attrition	Gender	Sum of Age	Sum of MonthlyIncome	Sum of PerformanceRating	Sum of JobSatisfac
1	1	Female	41	5993	3	4
2	1	Male	49	5130	4	2
4	1	Male	37	2090	3	3
5	1	Female	33	2909	3	3
7	1	Male	27	3468	3	2
8	1	Male	32	3068	3	4
10	1	Female	59	2670	4	1
11	1	Male	30	2693	4	3
12	1	Male	38	9526	4	3
13	1	Male	36	5237	3	3
14	1	Male	35	2426	3	2
Total	1473		54382	9559309	4636	4011

Attrition
(...)

Attrition
Yes

Employee Number
4

Attrition Rate
100%

Education Level

Employee Data_Form

Employee Number
4

Age
37
HR_Manager's Desk

MaritalStatus
Single

Education
2

Attrition
Yes

Department
Research & Development

Submit



Employee Details

Employee's Job Role
Laboratory Techn...

Department
All

Search Field

Employee Number	Count of Attrition	Gender	Sum of Age	Sum of MonthlyIncome	Sum of PerformanceRating	Sum of JobSatisfac
1	1	Female	41	5993	3	4
2	1	Male	49	5130	4	2
4	1	Male	37	2090	3	3
5	1	Female	33	2909	3	3
7	1	Male	27	3468	3	2
8	1	Male	32	3068	3	4
10	1	Female	59	2670	4	1
11	1	Male	30	2693	4	3
12	1	Male	38	9526	4	3
13	1	Male	36	5237	3	3
14	1	Male	35	2426	3	2
Total	1473		54382	9559309	4636	4011

Attrition
(...)

Attrition
Yes

Employee Number
4

Attrition Rate
100%

Education Level

Employee Feedback Form

Employee Number

Age

Attrition

BusinessTravel


Department

JobRole

Submit

DEVELOPMENT INTERFACE

(LINE MGRS. VIEW & UPLOAD PAGES)



Employee Data Page

Monthly Income
10M

Attrition
No

Active Employee
1233

Total Employee
1470

Employee Job Role
Healthcare Repre...

Department


All


Search Field

Employee Details

Employee Number	Gender	Sum of Age	MaritalStatus	Department	Sum of PerformanceRating	Sum of Jo
1	Female	41	Single	Sales	3	
5	Female	33	Married	Research & Development	3	
10	Female	59	Married	Research & Development	4	
15	Female	29	Single	Research & Development	3	
20	Female	29	Divorced	Research & Development	3	
23	Female	53	Married	Sales	3	
26	Female	24	Divorced	Research & Development	3	
28	Female	34	Single	Research & Development	3	
32	Female	53	Divorced	Research & Development	3	
33	Female	32	Single	Research & Development	4	
36	Female	44	Married	Research & Development	3	
38	Female	46	Single	Sales	3	
46	Female	43	Divorced	Research & Development	3	
49	Female	35	Married	Sales	3	
51	Female	36	Married	Research & Development	3	
52	Female	33	Married	Sales	3	

Select a Record to Activate Form





Employee Data Page

Monthly Income
9980

Attrition
No

Active Employee
1

Total Employee
1

Employee Job Role
Manufacturing D...

Department

All

Search Field

Employee Details

Employee Number	Gender	Sum of Age	MaritalStatus	Department	Sum of PerformanceRating	Sum of Jo
1	Female	41	Single	Sales	3	
5	Female	33	Married	Research & Development	3	
10	Female	59	Married	Research & Development	4	
15	Female	29	Single	Research & Development	3	
20	Female	29	Divorced	Research & Development	3	
23	Female	53	Married	Sales	3	
26	Female	24	Divorced	Research & Development	3	
28	Female	34	Single	Research & Development	3	
32	Female	53	Divorced	Research & Development	3	
33	Female	32	Single	Research & Development	4	
36	Female	44	Married	Research & Development	3	
38	Female	46	Single	Sales	3	
46	Female	43	Divorced	Research & Development	3	
49	Female	35	Married	Sales	3	
51	Female	36	Married	Research & Development	3	
52	Female	33	Married	Sales	3	

Employee Data

Employee Number

Age

MaritalStatus

Gender

Education

Department

Submit

KPI METRICS

Retention Factors Metrics

Overall Employee No:	1,470
Retention Count	1,233
Retention Rate	83.88%
Average Performance Rating	3.15
Average Percentage Salary Hike	15.21%
Job Satisfaction in Year	1,233
Average Age	38
Average Standard at Work	80.00

Attrition Factors Metrics

Overall Employee No:	1,470
Attrition Count	237
Attrition Rate	16%
Average Performance Rating	3.15
Average Percentage Salary Hike	15.21%
Average Attrition Age	37

RECOMMENDATIONS

Based On The Findings, The Following Actionable Steps Are Recommended:

Customized Retention Programs: Target high-risk departments with mentorship, skill enhancement, education assistance program and wellness initiatives.

Proactive Engagement Strategies: Increase regular feedback touchpoints for employees flagged with declining engagement.

Compensation Adjustments: Reassess salary progression and promotion timelines to enhance job satisfaction.

Predictive Monitoring: Continuously update the platform with real-time data to adapt retention strategies dynamically.

FUTURE WORK

To Further Enhance The Platform, Potential Areas Of Expansion Include:

Incorporating External Benchmarks: Compare internal data with industry standards for competitive analysis.

Behavioral Analytics: Use sentiment analysis on employee feedback to gain nuanced insights.

Mobile Integration: Develop a mobile application for easier access to platform features by HR personnel.

Ai-driven Recommendations: Enhance retention strategy suggestions using advanced ai algorithms for more precise outcomes.

CONCLUSION

The **data-driven employee performance and retention platform** provides **10alytics** with A transformative tool to predict and mitigate employee attrition risks while optimizing performance management.

By adopting this data-driven approach, **10alytics** demonstrates its commitment to fostering a supportive and innovative work environment. The platform's ability to deliver real-time insights and actionable recommendations ensures long-term organizational success and employee satisfaction.

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THANK YOU

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HR ANALYSTS

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