Power BI Case Study: Hr Analytics Dashboard

---

1. Business Problem Statement

The Human Resources (HR) department is facing challenges with: - High employee turnover - Inconsistent employee performance across departments - Varying employee satisfaction and engagement levels

Management wants to analyze employee demographics, performance, and termination patterns to build **data-driven HR strategies** for: 1. Reducing attrition 2. Improving employee engagement 3. Enhancing workforce performance

A **Power BI dashboard** will be developed to provide actionable insights into these areas.

---

2. Dataset: HR_Dataset

Data Dictionary

Column	Description
Employee_Name	Full name of the employee
EmpID	Unique employee identifier
MarriedID	Encoded marital status (married or not)
MaritalStatusID	Encoded marital category
GenderID	Encoded gender (1 = Male, 0 = Female)
EmpStatusID	Employment status code
DeptID	Encoded department ID
PerfScoreID	Encoded performance score ID
FromDiversityJobFairID	1 = Hired from diversity job fair, 0 = Not
Salary	Employee salary

Column	Description
Termd	1 = Terminated, 0 = Active
PositionID	Encoded job position ID
Position	Job title
State	Work location (state)
Zip	Zip code
DOB	Date of birth
Sex	Gender (M/F)
MaritalDesc	Marital status
CitizenDesc	Citizenship status
HispanicLatino	Yes/No ethnicity
RaceDesc	Race
DateofHire	Hire date
DateofTermination	Termination date (if applicable)
TermReason	Termination reason
EmploymentStatus	Active/Terminated status
Department	Department name
ManagerName	Reporting manager
ManagerID	Manager unique ID
RecruitmentSource	Hiring source
PerformanceScore	Performance rating (Exceeds, Meets, etc.)
EngagementSurvey	Engagement score (0–5)
EmpSatisfaction	Satisfaction score (1–5)

Column	Description
SpecialProjectsCount	Number of projects
LastPerformanceReview_Date	Date of last performance review
DaysLateLast30	Days late in last 30 days
Absences	Number of absences

---

3. Data Cleaning & Transformation (Power Query)

Before visualization, the dataset will be cleaned in **Power Query**:

1. Remove Duplicates

- Identified and removed duplicate records using the Employee ID field.

2. Replace Null Values

- For the `TermReason` column: Replaced null or "N/A - Still Employed " with "Still Employed".
- For `Manager ID`: Null values (only for Webster Butler) replaced with `0`.
- For `Date of Termination`: Null values replaced with a placeholder date "20-10-2019".

3. Data Type Conversion

- Columns like `DOB`, `Date of Hire`, `Date of Termination`, `Last Performance Review Date` were converted from "MM-DD-YYYY" to "DD-MM-YYYY" for consistency.
- Converted these columns into “Date” data types.
- Salary values were converted to fixed decimal numbers.
- Split and merged columns were used as needed for these conversions.

4. Create New Columns

- Added an "Age" column, as it was not present in the original data.
- Age was calculated as `(Current Date - DOB) / 365`, with type conversion to decimal.

5. Calculate Tenure

- Calculated "Tenure" as `Date of Termination - Date of Hire` and changed its data type to duration in years.

6. Attrition Flag Transformation

- Standardized `Termd` column (Yes/No format) into 0 (No) and 1 (Yes) using conditional columns.

7. Standardize Categories

- Normalized `Sex` to "M" for Male and "F" for Female.

8. Filter Out Irrelevant Fields

- Removed `Gender ID` as `Sex` column sufficed.
- Removed `PerfScoreID` and replaced it with readable categories: 1 for PIP, 2 for Needs Improvement, 3 for Fully Meets, and 4 for Exceeds.
- Removed `Dept ID` and translated values to department names: 1 for Admin Offices, 2 for Executive Office, 3 for IT, 4 for Software Engineer, 5 for Production, and 6 for Sales.
- Ensured all records matched appropriate department and performance fields after cleaning.

---

4. Data Visualization

1 Univariate Analysis (Single Variable)

- **Gender distribution** → Pie Chart (`Sex`)
- **Marital status distribution** → Donut Chart (`MaritalDesc`)
- **Performance score categories** → Bar Chart (`PerformanceScore`)
- **Salary distribution** → Histogram (`Salary`)
- **Workforce diversity by race** → Column Chart (`RaceDesc`)
- **Recruitment sources used** → Bar Chart (`RecruitmentSource`)

- **Satisfaction scores distribution** → Histogram (`EmpSatisfaction`)
- **Employee count by department** → Bar Chart (`Department`)

---

2 Bivariate Analysis (Two Variables)

- **Average salary by department** → Bar Chart (`Department`, `Salary`)
- **Performance scores across departments** → Stacked Column Chart (`Department`, `PerformanceScore`)
- **Hiring sources vs. terminations** → Clustered Column Chart (`RecruitmentSource`, `Termd`)
- **Managers vs. absences** → Bar Chart (`ManagerName`, `Absences`)
- **Employee satisfaction by gender** → Column Chart (`Sex`, `EmpSatisfaction`)
- **Engagement by race** → Bar Chart (`RaceDesc`, `EngagementSurvey`)

---

3 Multivariate Analysis (3+ Variables)

- **Department vs. Gender vs. Termination** → Stacked Bar Chart (`Department`, `Sex`, `Termd`)
- **Salary vs. Performance vs. Department** → Scatter Plot (color-coded by Department)
- **Satisfaction vs. Engagement vs. Performance** → Scatter Matrix
- **Salary trend by Race & Gender** → Box Plot / Clustered Bar (`Salary`, `RaceDesc`, `Sex`)

---

4 Time-Based Analysis

- **Yearly hiring trend** → Line Chart (`DateofHire` by Year)
- **Termination trend over time** → Line Chart (`DateofTermination` by Year)

---

5. Building the Dashboard (Final Layout)

The dashboard will consist of **multiple pages**:

1. **Overview Page**
    - KPIs: Total Employees, Active Employees, Terminated Employees, Avg. Tenure, Avg. Salary
    - Gender distribution, Marital status, Race diversity
2. **Attrition Analysis Page**
    - Termination by department, gender, and reason
    - Hiring source vs. attrition rate
    - Termination trend over years
3. **Performance & Engagement Page**
    - Department-wise performance scores
    - Engagement vs. satisfaction scatter plot
    - Absenteeism by manager
    - Special projects vs. performance
4. **Compensation Analysis Page**
    - Salary distribution by department and gender
    - Salary vs. performance relationship
    - Box plot for salary across race and gender
5. **Interactive Filters (Slicers)**
    - Department
    - Employment Status
    - Performance Score
    - Termination Reason
    - Manager Name
    - Recruitment Source

HR Dashboard

Clear all

Filter Panel

Department
All

Employee Status
All

Performance Score
All

Termination Reason
All

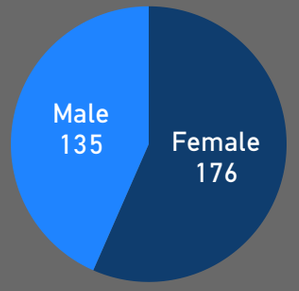
Manager Name
All

Recruitment Source
All

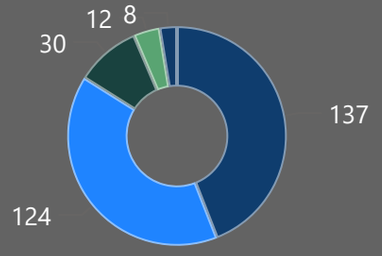
Overview

Total Employees	Active Employees	Terminated Employees	Avg Tenure	Avg Salary
311	207	104	4.8Y	69K

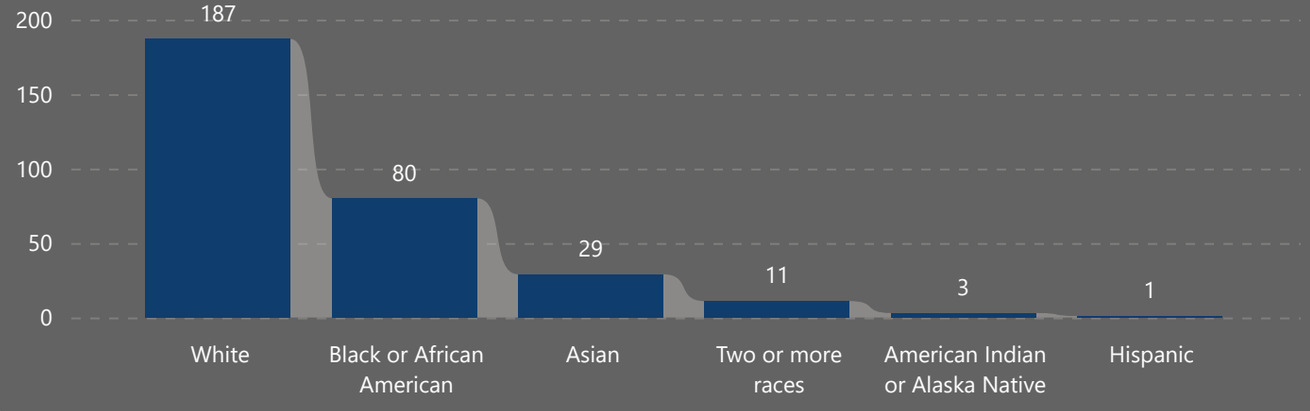
Gender Distribution



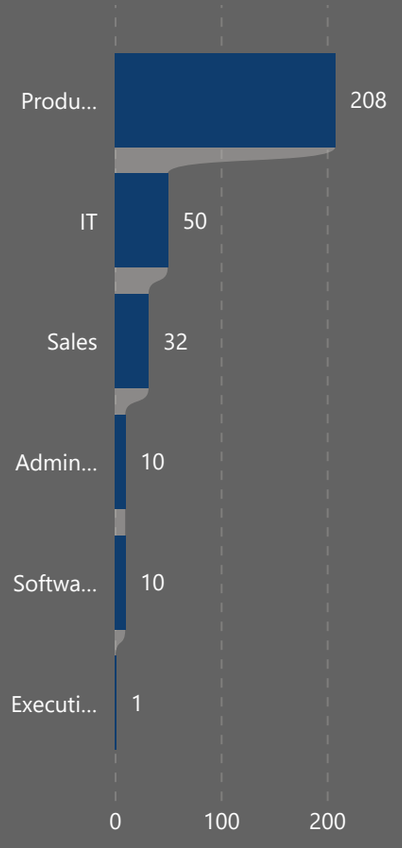
Material Status



Work Force Diversity bt Race



Employee Count by Department



HR Dashboard

Clear all

Filter Panel

Department
All

Employee Status
All

Performance Score
All

Termination Reason
All

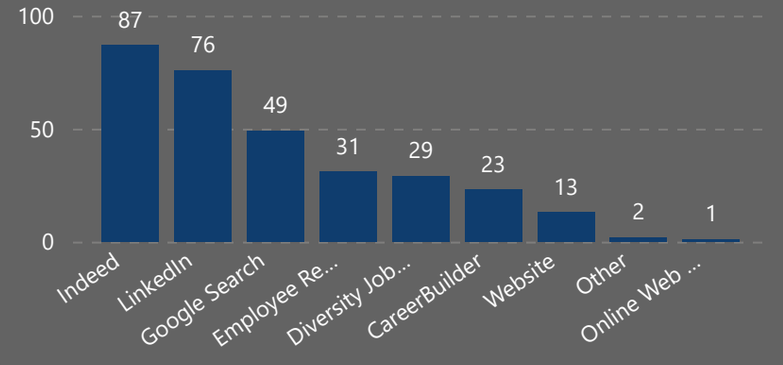
Manager Name
All

Recruitment Source
All

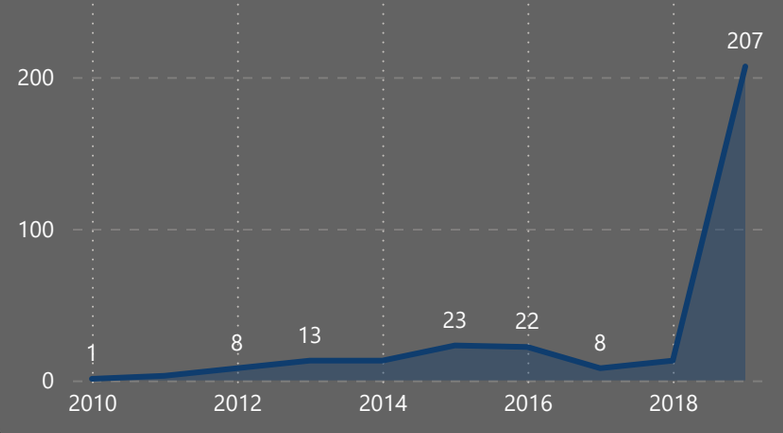
Attrition Analysis

Total Employees	Active Employees	Terminated Employees	Avg Tenure	Avg Salary
311	207	104	4.8Y	69K

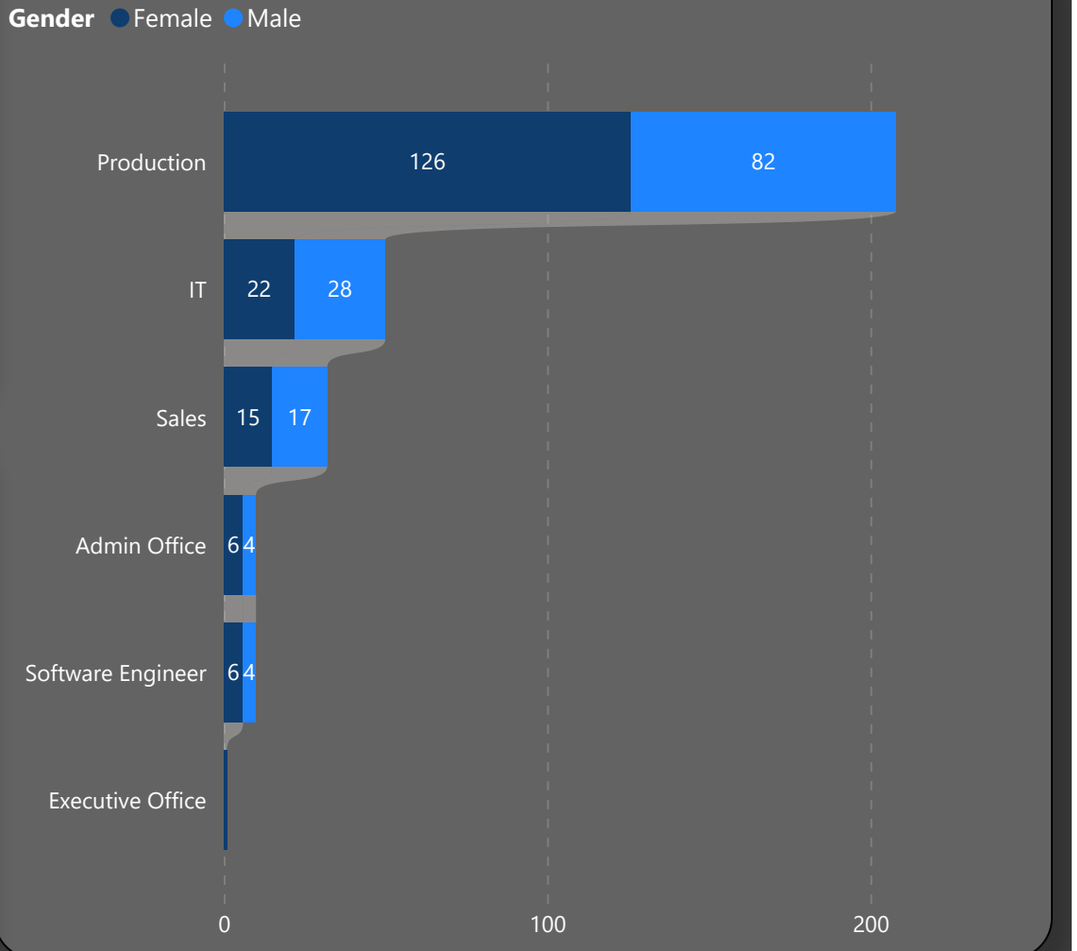
Hiring Source by Attrition Rate



Count of DateofTermination by Year



Terminated By Department, Gender



HR Dashboard

Clear all

Filter Panel

Department
All

Employee Status
All

Performance Score
All

Termination Reason
All

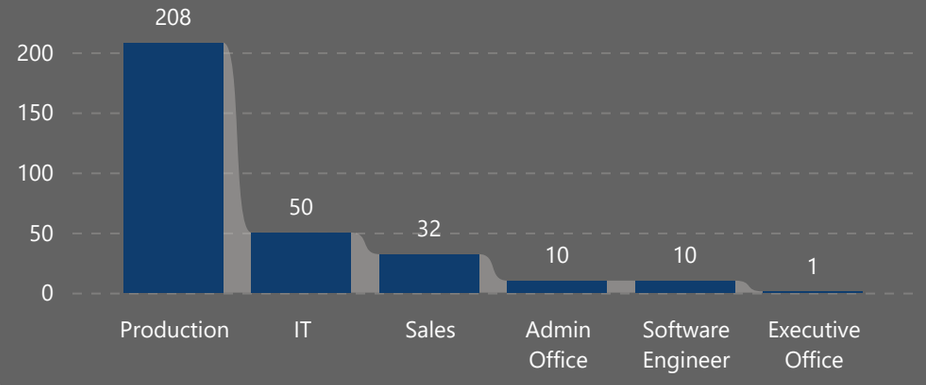
Manager Name
All

Recruitment Source
All

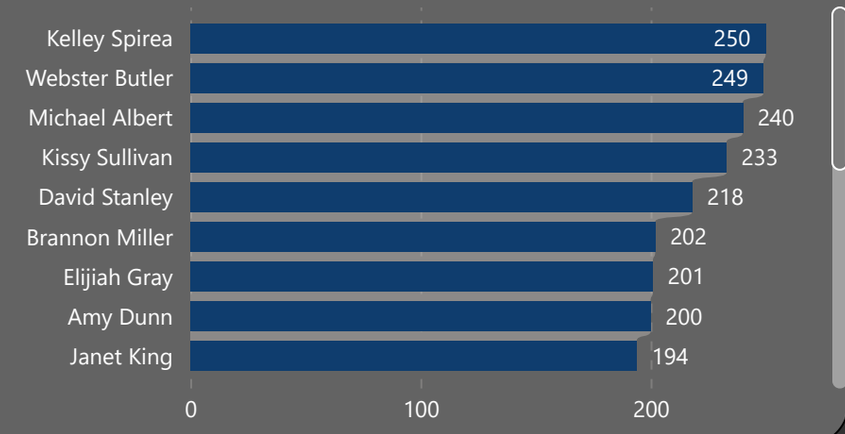
Performance and Engagement Scores

Total Employees	Active Employees	Terminated Employees	Avg Tenure	Avg Salary
311	207	104	4.8Y	69K

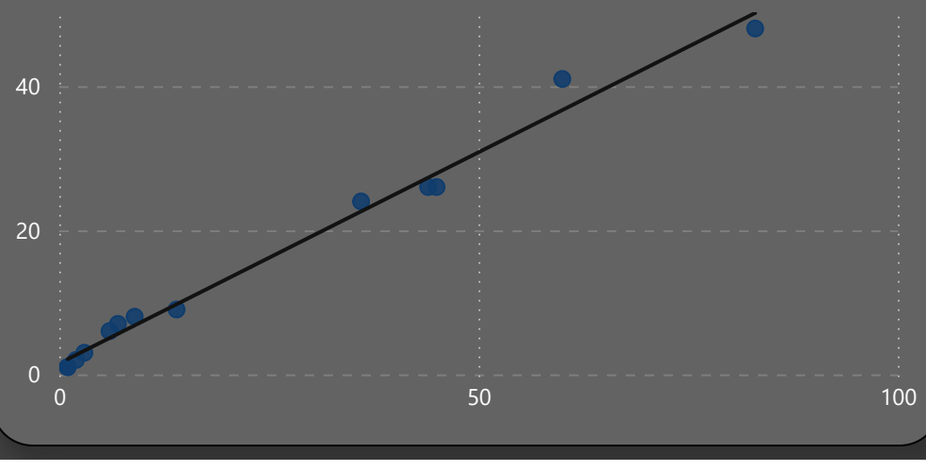
Department wise Performance Scores



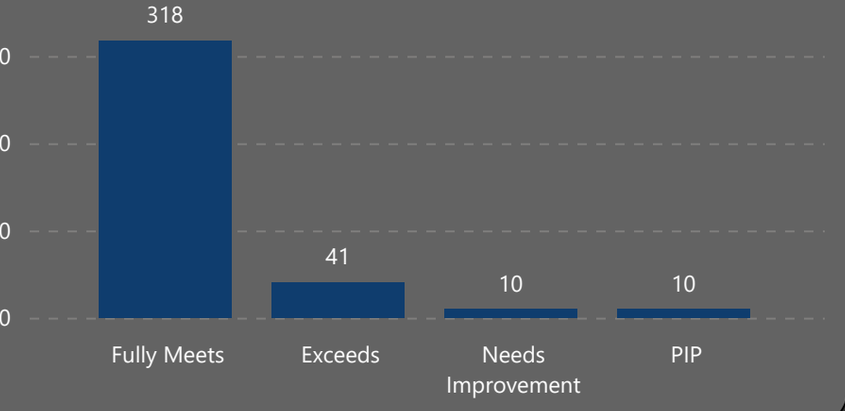
Absences by Managers



Engagement Survey by EmpID



Special project vs Performance



HR Dashboard

Clear all

Filter Panel

Department
All

Employee Status
All

Performance Score
All

Termination Reason
All

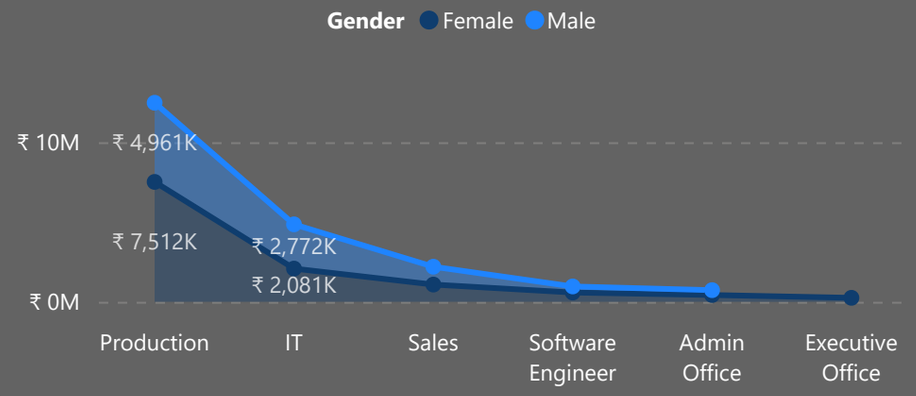
Manager Name
All

Recruitment Source
All

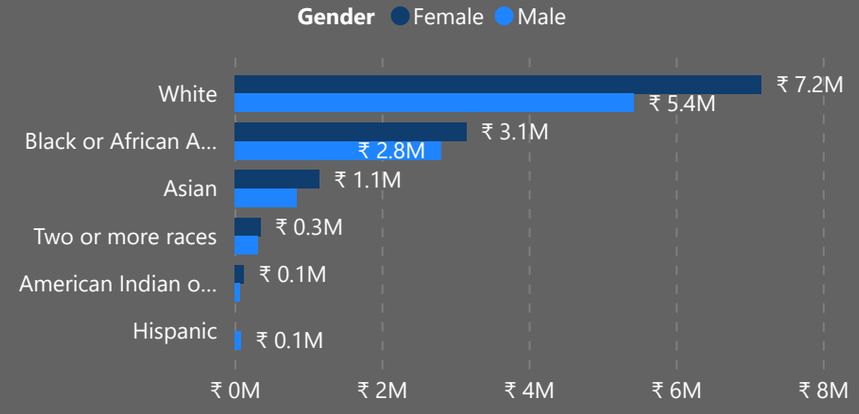
Compensation Analysis

Total Employees	Active Employees	Terminated Employees	Avg Tenure	Avg Salary
311	207	104	4.8Y	69K

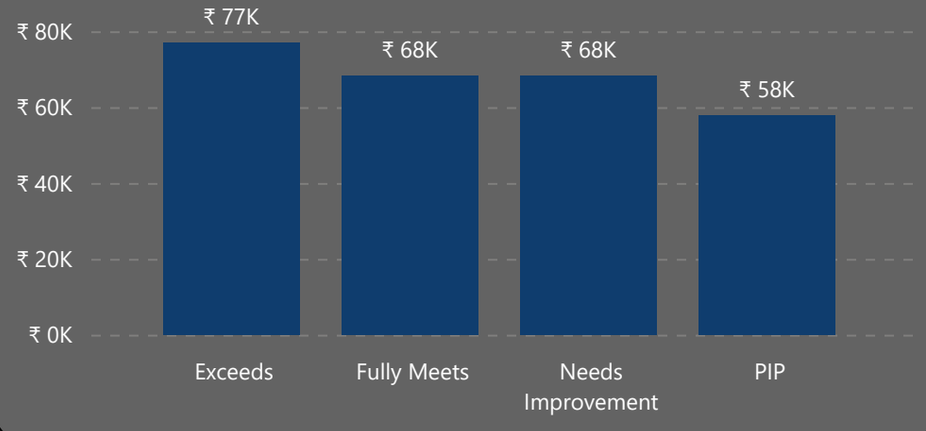
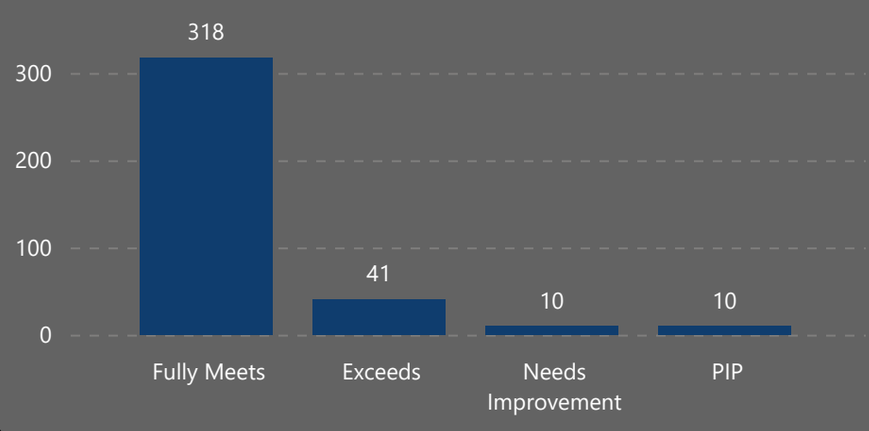
Salary distribution by Department & Gender



Salary across race and Gender



Performance vs Avg Salary



Special project vs Performance