

Data Analytics Project (DEPI)

Team Members:

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Project Idea 3: Human Resources Dataset Analysis

Tools: Excel, Python, Tableau.

Overview Of Our Data

<u>Education Level Data</u>	Provides insights into the education backgrounds of employees , highlighting their qualifications and the correlation with job performance and salary .
<u>Employee Data</u>	A comprehensive list of employees, including demographic details such as age , gender , marital status , and job roles .
<u>Performance Rating Data</u>	Tracks individual performance metrics , capturing data from employee reviews and assessments over time.
<u>Rating Level Data</u>	Details performance ratings for employees , evaluating their overall contributions and effectiveness in their roles.

<u>Satisfied Level Data</u>	This contains information on employee satisfaction ratings, categorized by various factors such as job satisfaction and work-life balance.
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EmployeeID, Gender, Age, BusinessTravel, Department, DistanceFromHome (KM), State, Ethnicity, EducationField, JobRole, MaritalStatus, Salary, StockOptionLevel, OverTime, HireDate, Attrition, YearsAtCompany, YearsInMostRecentRole, YearsSinceLastPromotion, YearsWithCurrManager

ReviewDate, EnvironmentSatisfaction, JobSatisfaction, RelationshipSatisfaction, TrainingOpportunitiesWithinYear, TrainingOpportunitiesTaken, WorkLifeBalance, SelfRating, ManagerRating

Data Cleaning

1. Deletes duplicate rows.
 2. Delete some of the columns such as the ethnicity column.
 3. Checking and handling missing values.
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Data Analysis Insights

1. Demographic Insights

Age Impact on Job Satisfaction and Attrition:

- How does job satisfaction vary across different age groups?
- What is the attrition rate for different age groups?

Gender Differences in Job Satisfaction and Performance:

- How does job satisfaction vary between male and female employees?
- Is there a difference in performance ratings between male and female employees?

Education Level and its Impact on Performance and Salary:

How does education level influence employee performance and salary variation?

- How does education level impact employee performance?
- How does salary vary by education level?

How does **education level** impact employee **performance** by **manager rating**?

Marital Status and Attrition

How does **marital status** influence **attrition rates** and **job satisfaction**?

- Does **marital status** affect **attrition** rates?
 - Is there a **relationship** between **marital status** and **job satisfaction**?
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2. Geographic Insights

Distance from Home and Its Impact on Job Satisfaction:

- How does **the distance** from home **affect job satisfaction**?

Attrition by State:

- Which **states** have **the highest** and **lowest attrition** rates?

Which **states** have the **highest percentage** of employees leaving due to **excessive overtime**?

3. Psychographic Insights

Work-Life Balance and Job Satisfaction:

- How does **work-life balance** affect overall **job satisfaction**?
- Is there a **relationship** between **work-life balance** and **business travel** frequency?

Training and Performance Improvement

- How does **participation** in **training** programs **impact** employee performance?
 - Is there a **connection** between **training** and **job satisfaction** or **promotion rates**?
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4. Behavioral Insights

Performance Behaviors and Job Satisfaction:

- How does **performance rating** correlate with **job satisfaction**?
- What is **the attrition rate** for employees with **different performance ratings**?

Overtime and Workload Behaviors:

- What is **the impact of overtime** on **job satisfaction**?

- Is there a **relationship** between **overtime** and **performance**?
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Data Analysis

Total Employee	1470
Female	675 => 45.91%
Male	651 => 44.28%
Non-Binary	124 => 8.43%
Prefer not to say	20 => 1.36%

State	Number Of Employee	Number of Attrition
CA	875 => 59.52%	153 => 17.48%
NY	419 => 28.50%	58 => 13.84%
IL	176 => 11.97%	26 => 14.77%

Age Group	Number Of Employee
Early Career / Young Adults (18-25)	650 => 44.21%
Emerging Professionals (26-35)	497 => 33.80%
Mid-Career (36-45)	252 => 17.14%
Senior Professionals (46-51)	71 => 4.82%

State	Job Role	Number Of Employee
CA	Sales Executive	188
	Software Engineer	172
	Data Scientist	162
NY	Sales Executive	98
	Software Engineer	91
	Data Scientist	67
IL	Sales Executive	41
	Data Scientist	32
	Software Engineer	31

Department	Count => Percentage
Technology	828 => 56.32%
Sales	354 => 24.08%
Human Resources	51 => 3.46%

Job Role	Average Of Salary	No Of Employee
Sales Executive	114627.8407	270
Software Engineer	54290.52227	247

Data Scientist	57632.58291	199
Machine Learning Engineer	131145.7132	136
Senior Software Engineer	124429.4472	123
Engineering Manager	282548.3562	74
Sales Representative	43437.28	50
Analytics Manager	345410.7347	49
Manager	315899.5714	35
HR Executive	88655.44	25
Recruiter	39330.13333	15
HR Business Partner	314002.4286	7
HR Manager	449330.75	4

Gender	No Of Employee
Married	624 => 52.02%
Single	549 => 44.52%
Divorced	297 => 24.08%

Observations:

- Gender Distribution:** The employee base is relatively balanced, with slightly more females (45.91%) compared to males (44.28%). A notable percentage (8.43%) identify as non-binary, reflecting the company's inclusiveness.
- State and Attrition:** California (CA) holds most employees (59.52%), but also has a significant attrition rate of 17.48%. New York (NY) and Illinois (IL) have smaller employee bases and similar attrition rates of 13-15%.
- Age Groups:** Nearly 80% of your workforce is under 35 years old, with the largest group being Early Career professionals (18-25). This suggests a relatively young workforce.
- Job Roles and Salary:** Engineering roles such as Machine Learning Engineer and Senior Software Engineer have notably higher salaries, while managerial roles such as Engineering Manager and HR roles like HR Business Partner and HR Manager receive the highest salaries.
- Department Composition:** The Technology department represents over half of the workforce (56.32%), followed by Sales (24.08%).
- Marital Status:** Over half of the workforce is married (52%), with a significant portion being single (44%).

Suggested Employee Profile

1. Junior Employee Profile

Suggested Characteristics:

- **Age Group:** Primarily from the "Early Career / Young Adults" (18-25 years) group, which represents 44.21% of your workforce. This group is adaptable, eager to learn, and generally willing to take on entry-level positions in technology, sales and so on.
- **Education and Skills:** Candidates with degrees or certifications in relevant fields like computer science, data science, software engineering, sales, or marketing are preferred. Skills in programming (for tech roles) and communication (for sales roles) are essential.
- **Job Roles:** Junior employees might fill positions like:
 - Software Engineer
 - Data Analytics
 - Machine Learning Engineer
 - Sales Representative
 - HR Executive
 - Recruiter
- **Geographic Location:** Focus on states like California and New York where many junior employees are currently based, especially in tech and sales roles and so on.
- **Personality:**
 - **Growth-Oriented:** Junior employees should show ambition and the potential for rapid development.
 - **Team Players:** Employees in junior roles are likely to work collaboratively, making team dynamics and communication key traits.
- **Marital Status:** Single candidates (44.52%) are more likely to prioritize career growth and may seek opportunities for relocation or high engagement, offering flexibility for the company.
- **Experience:** 1-5 years of experience in respective

Retention Strategy:

- Offer mentorship programs and clear career progression pathways to help them transition into senior roles.
- Offer continuous learning opportunities, such as access to courses, certifications, workshops, and conferences, especially in tech fields where skills need to evolve.
- Provide competitive starting salaries and benefits, particularly in tech roles (e.g., Software Engineers and Data Analytics and so on).
- Regularly recognize employees for their achievements through awards, bonuses, or public acknowledgment, fostering a sense of appreciation.
- Combine the benefits of both in-office and remote work to accommodate varying employee preferences.

2. Senior Employee Profile

Suggested Characteristics:

- **Age Group:** Candidates from the "Emerging Professionals" (26-35 years) and "Mid-Career" (36-45 years) age groups, which account for 50.94% of your workforce. These employees bring stability and experience to leadership roles.
- **Experience:** Senior employees should have **5+ years of experience** in their field, with proven track records in leadership, problem-solving, and team management.
- **Job Roles:** Senior employees should fill leadership and high-responsibility roles like:
 - Sales Executive
 - Data Scientist
 - Senior Software Engineer
 - Engineering Manager
 - Analytics Manager
 - HR Business Partner
 - Manager
 - HR Manager
- **Geographic Location:** Focus on retaining and hiring senior employees in **New York** and **Illinois**, where attrition rates are lower compared to California, suggesting these locations are more suitable for long-term senior roles.
- **Personality:**
 - **Strategic Thinkers:** They should be capable of making long-term decisions and managing complex projects.
 - **Leadership Skills:** Senior employees should excel at leading teams and driving innovation.
 - **Stability:** Married candidates (52.02%) may seek long-term roles, valuing benefits like retirement plans and health insurance.

Retention Strategy:

- Implement **leadership development programs** and provide **equity stakes** or long-term incentives to retain top senior talent.
 - For senior-level employees, **flexibility** can be a **significant perk**. Options for working remotely or **having flexible hours** while **maintaining senior-level responsibilities** can greatly **improve work-life balance**.
 - Provide **performance-based executive bonuses** tied to **long-term goals** such as **profitability**, **revenue growth**, or **strategic project completion**.
 - Conduct **regular salary reviews** to ensure senior employees are **compensated fairly** based on **their experience**, **industry standards**, and **contributions**. Ensure they are among the **best-compensated** employees to **reduce poaching** by **competitors**.
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