eyouth X DEPI Project Proposal

Submitted by:

Eyouth

Project Proposal: Human Resources Attrition Analysis & Dashboard

Date: October 13, 2025

Course: Digital Egypt Pioneers Initiative - Graduation Project

Project ID: Project Idea 3: Human Resources Dataset Analysis

1. Project Description

This project aims to analyze a corporate Human Resources (HR) dataset to identify, analyze, and visualize the key factors driving employee attrition. The project will involve a complete data lifecycle:

1. **Data Cleaning & Preparation:** Using Python (Pandas) to clean the raw data, remove irrelevant fields, and engineer new features (e.g., `tenure`).
2. **Data Structuring:** Splitting the data into a normalized, relational model (5 CSVs) and loading it into an SQL database.
3. **Data Analysis:** Using SQL to query the database and answer key business questions, specifically calculating the overall attrition rate and the attrition rate by department.
4. **Data Modeling & Visualization:** Developing a data model and building a final interactive dashboard in Tableau to present these insights in a clear, accessible, and actionable format for decision-makers.

2. Group Members & Roles

Member Name	Assigned Role	Key Responsibilities
[Mikhhail]	Data Modeling & Dashboard Lead	- Co-develop the final data model. - Lead the design and development of the Power bi dashboard. - Integrate analytical insights into the final visual report.
Amr	Data Modeling & Dashboard Lead	- Co-develop the final data model. - Support Tableau dashboard development and functionality. - Assist in preparing the final presentation.

Soty	Data Cleaning & Preparation (Python)	- Clean raw dataset (remove `standardHours`, `over18`, etc.). - Engineer new features (`hiredate`, `terminationdate`, `tenure`). - Split the data into 5 normalized CSV files, ensuring `employeenumber` is the foreign key.
Marian	Database & SQL Analysis	- Receive cleaned CSVs from Soty. - Create 4 tables in an SQL database using the `COPY` function. - Write and execute SQL queries for: 1. Overall Attrition Rate. 2. Attrition Rate by Department. - Provide the team with database connection details.

3. Team Leader

- **Team Leader:** [Mikhail Farag Ezzat Lawendy]

4. Objectives

The primary goals of this project are:

1. To preprocess and clean the raw HR dataset to ensure data quality, accuracy, and readiness for analysis.
2. To build a structured, relational SQL database from the cleaned data, establishing clear relationships between employee, job, salary, and attrition information.
3. To precisely calculate and analyze the overall employee attrition rate and identify variations in attrition across different departments.
4. To develop a comprehensive data model and an interactive Tableau dashboard that visually communicates key attrition metrics and trends.
5. To provide actionable recommendations based on the analysis to help the organization's leadership make informed decisions to reduce employee turnover.

5. Tools & Technologies

- **Data Cleaning & Processing:** Python (Pandas library)
- **Database Management:** SQL (PostgreSQL, which supports the `COPY` function)
- **Data Analysis:** SQL, Python (Pandas)

- **Data Visualization:** Power bi
- **Project Collaboration:** Git/GitHub (for code sharing and version control)

6. Milestones & Deadlines

The project is structured into a 4-week timeline, culminating in the final submission on December 1, 2025.

Milestone	Key Tasks	Owner(s)	Deadline
Week 1: Data Preparation	- Data cleaning & feature engineering. - Data normalization and export to 5 CSVs. - Create database and tables.	Soty	Nov 9, 2025
Week 2: Database & SQL Analysis	- Load all CSV data. - Execute SQL queries for attrition rates. - Connect Tableau to the SQL database.	Marian	Nov 16, 2025
Week 3: Modeling & Dashboard	- Develop the data model. - Build the first functional dashboard prototype. - Finalize dashboard (UI, filters, tooltips).	Mikhail, Amr	Nov 23, 2025
Week 4: Finalization & Review	- Prepare final report and presentation. - Team review and quality assurance.	All	Nov 30, 2025
Final Submission	- Submit all project deliverables.	All	**Dec 1, 2025**

7. Key Performance Indicators (KPIs)

Based on the project guidelines, our team will measure success against the following KPIs:

1. Data Cleaning & Processing

- **100%** of missing/duplicate data handled.
- **100%** of specified irrelevant columns removed.
- **100%** of new features (e.g., `tenure`) successfully engineered.

2. Analysis & Insights

- **100%** of agreed-upon business questions (Overall Attrition, Attrition by Department) answered accurately.

3. Visualization & Reporting

- Dashboard load time: **< 3 seconds**.
- Dashboard usability: **≥ 80%** of users can navigate and find key insights without help.

4. Final Documentation & Presentation

- Final report completeness: **100%**.
- Number of actionable recommendations: **≥ 3**.