**1-Project Planning & Management**

**Project Proposal**

1. **Project Overview**

This project aims to leverage HR data to improve decision-making in employee performance management, compensation strategies, and recruitment effectiveness. The dataset includes key employee attributes such as performance scores, salary, department, position, and recruitment sources.

1. **Objectives**

Analyze factors affecting employee performance based on PerfScoreID, Salary, and other attributes.

Identify patterns in recruitment success based on RecruitmentSource.

Assess salary equity across departments, positions, and demographics.

Provide insights into employee retention and turnover trends using hire dates and performance data.

Determined what is the relation between the employees ages and their satisfaction level.

1. **Scope**

Data Cleaning & Preprocessing: Handling missing values, standardizing formats, and ensuring data integrity.

Exploratory Data Analysis (EDA): Identifying patterns in performance, recruitment success, and salary trends.

Predictive Modeling: Developing machine learning models to predict high-performing employees and turnover risks.

Data Visualization & Reporting: Creating dashboards to provide actionable insights for HR decision-makers**.**

1. **Project Plan & Timeline**

|  |  |  |
| --- | --- | --- |
| **Phase** | **Activiti** | **Duration** |
| Build Data Model, Data Cleaning and Preprocessing | Build a data model and clean and preprocess the data. | 1week |
| Analysis Questions Phase | Determine all possible analysis questions that can be deducted from the given dataset and would be of interest to the organization’s decision makers, | 2weeks |
| Forecasting Questions Phase | Determine a set of forecasting questions and answer them using the trends found in the given dataset. | 2weeks |
| Visualization Dashboard and Final Presentation | Build a Tableau visualization dashboard that visualize the answers to all answered questions | 2weeks |

**5. Risk Assessment & Mitigation**

Data Quality Issues → Implement data validation and cleaning procedures.

Bias in Predictions → Ensure fairness by testing for demographic biases.

Stakeholder Buy-in → Regular feedback sessions with HR teams**.**

**6. KPIs for Success**

Improved hiring efficiency (e.g., best recruitment sources identified).

Increased performance prediction accuracy (e.g., correlation between hiring source and performance).

Salary equity analysis results (e.g., fair compensation strategies suggested).

Dashboard usability feedback from HR professionals

**2. Literature Review**

Feedback & Evaluation

Suggested Improvements

Final Grading Criteria

**3. Requirements Gathering**

**Stakeholder Analysis**

**Employee Performance & Productivity** – Tracking performance metrics to identify high and low performers, training needs, and productivity trends.

**Recruitment & Retention** – Assessing hiring trends, employee turnover, and reasons for attrition to improve talent acquisition and retention strategies.

**Training & Development** – Identifying skill gaps and opportunities for professional growth through training programs.

**HR Cost Management** – Evaluating HR-related expenses to optimize budget allocation and cost efficiency.

**Strategic Decision-Making** – Providing data-driven insights to improve overall workforce management and business outcomes.

**2. User Stories & Use Cases**

**User Stories:**

* As an **HR Manager**, I want to track employee absences and lateness so that I can identify patterns and take corrective actions.
* As a **Department Head**, I need to evaluate performance scores to ensure employee productivity aligns with company goals.
* As an **Employee**, I want to view my engagement survey results to understand how my feedback impacts workplace policies.
* As a **Finance Officer**, I need salary and department data to allocate budgets effectively.
* As an **IT Administrator**, I want a structured dataset to integrate with HR analytics tools for reporting and visualization.

**Use Cases:**

1. **Employee Performance Tracking**: HR analyzes performance scores and satisfaction levels to identify high and low-performing employees.
2. **Absence & Lateness Analysis**: HR tracks absences to flag potential attendance issues.
3. **Salary & Budget Planning**: Finance uses salary data to forecast costs and allocate resources.
4. **Manager Performance Evaluation**: Management reviews department and employee performance under each manager.
5. **Employee Retention Analysis**: HR monitors terminations and their reasons to improve retention strategies.

**3. Functional Requirements**

* Ability to track employee information, including department, position, manager, and salary.
* Record and analyze employee absences and late occurrences.
* Store and retrieve employee satisfaction and engagement survey results.
* Map managers to their respective employees and departments.
* Maintain termination records with reasons and employment status.
* Performance tracking through score mapping and analysis.
* Department-wise employee and budget allocation insights.
* Data export functionality for further analysis and reporting.

**4. Non-Functional Requirements**

* **Performance**: The system should efficiently handle large HR datasets without latency.
* **Security**: Access control to ensure that sensitive employee information is available only to authorized users.
* **Usability**: Data should be structured in a user-friendly manner for easy analysis and reporting.
* **Reliability**: The system should ensure accurate data processing and prevent inconsistencies.
* **Scalability**: Should support future data expansion and integration with other HR tools.

This document provides a comprehensive requirements gathering framework for HR analytics using the given dataset.

**4. System Analysis & Design**

**1.Problem Statement & Objectives – Define the problem being solved and project goals.**

**Problem Statement:**

**The system aims to efficiently manage and analyze employee data within an organization. The challenge lies in handling a large and diverse dataset that includes employees' personal details, performance metrics, job-related information, and more. The data needs to be cleaned, organized, and easily accessible to facilitate effective decision-making, reporting, and human resources management.**

**Possible issues to address could include:**

* **Inconsistent or missing data that impacts accurate reporting.**

**Difficulty in tracking employee performance, satisfaction, and engagement.**

* **Lack of centralized access to employee records for managers and HR teams.**
* **Insufficient tools to analyze key factors like employee turnover, performance scores, absenteeism, and other critical HR metrics.**

**Objectives:**

**The primary goal of the system is to streamline HR data management by:**

* **Centralizing Employee Information: Collecting all relevant data in a single, organized system to simplify management and decision-making.**
* **Tracking and Reporting Employee Metrics: Enabling HR and management to track performance, absences, satisfaction, and other key metrics.**
* **Improving Employee Engagement: Using data insights to identify opportunities for improving employee satisfaction and engagement.**
* **Predicting Trends: Analyzing historical data to predict trends like employee turnover, performance issues, or potential absenteeism.**
* **Automating Reporting: Providing automated reports on performance, absences, promotions, and other relevant aspects to assist in strategic planning.**

**\* Use Case Diagram & Descriptions – Identify system actors and interactions.**

**Diagram:**

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**Description:**

**Actors and Interactions:**

* **HR Manager**: The person responsible for overseeing employee records, managing data updates, generating reports, and handling employee-related decisions.
* **Employee**: The individual whose data (personal, performance, satisfaction, etc.) is stored and can be accessed by HR or managers for review.
* **Manager**: The person directly responsible for overseeing employees, evaluating their performance, and providing feedback.

**Use Case Diagram:**

1. **HR Manager**:
   * View employee records.
   * Update employee data (e.g., salary, position, status).
   * Generate performance and attendance reports.
   * Monitor trends in employee engagement and satisfaction.
2. **Employee**:
   * View personal and job-related information.
   * Update personal information (e.g., marital status, recruitment source).
   * Participate in surveys for engagement and satisfaction.
3. **Manager**:
   * View performance scores of team members.
   * Evaluate employee performance and leave comments.
   * Provide feedback on engagement surveys.

**\* Functional & Non-Functional Requirements – Clearly state system capabilities and constraints.**

1. Functional Requirements

* Functional requirements describe the system’s behavior, actions, and services. They outline the features and functionality that the system must support in order to meet the needs of users.

Key Functional Requirements for an HR System:

1. Employee Data Management:

The system must allow HR managers to add, update, delete, and retrieve employee records, including personal details (e.g., name, date of birth, marital status), job information (e.g., department, position, manager), performance data (e.g., performance scores), and attendance records.

1. Performance Tracking:

The system must allow HR managers and managers to track employee performance scores over time. This should include the ability to:

* View current and historical performance scores.
* Generate performance reports.
* Flag employees with low performance scores.

1. Absence and Attendance Management:

The system should allow HR and managers to track employee absences and lateness, including:

* Viewing absence records for the last 30 days.
* Generating reports on employee attendance trends.

1. Reporting:

The system must generate various reports based on employee data, such as:

Employee performance reports (e.g., performance score over time).

* Absence reports (e.g., absenteeism trends, frequency of tardiness).
* Employee satisfaction surveys and engagement metrics.
* Departmental performance comparison.

1. Data Filtering and Search:

The system should allow HR and managers to search employee records by various attributes, such as:

* Department ID, Position ID, Manager ID, Employee ID.
* Performance scores, salary range, marital status.
* Date of hire, termination status.

1. User Access Control:

The system must support role-based access, where:

* HR Managers have full access to all employee records.
* Managers have access to data related to their direct reports.
* Employees can only view and edit their own data (e.g., personal details, performance scores).

1. Employee Engagement Surveys:

The system must allow employees to participate in engagement and satisfaction surveys. HR managers should be able to view aggregated results for analysis.

1. Data Import and Export:

The system should provide the capability to import employee data from external sources (e.g., Excel files) and export data for further analysis or reporting.

1. Notifications:

The system should send notifications to HR or managers when:

* An employee's performance score falls below a certain threshold.
* An employee exceeds a certain number of absences or lateness.

**2.Database Design & Data Modeling**

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**3. Data Flow & System Behavior**

**DFD**

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**Sequence Diagrams**

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**State Diagram**

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**Class Diagram**

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