HR Analytics

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Contents

Abstract:

This abstract presents an HR analytics project focused on leveraging data-driven insights to enhance various aspects of human resources management within an organization. The project aims to utilize advanced analytics techniques to extract valuable information from HR data, enabling data-driven decision-making and improving overall HR processes.

The project encompasses several key areas of HR, including recruitment and selection, employee performance evaluation, talent management, and employee engagement. By analyzing historical and real-time data, the project seeks to identify patterns, trends, and correlations to provide actionable recommendations for HR professionals.

The project will employ a combination of descriptive, predictive, and prescriptive analytics techniques to analyze large volumes of HR data, including employee demographics, performance metrics, training records, and feedback surveys. Through these analytics methods, the project aims to uncover insights such as predictors of employee success, factors impacting attrition rates, and strategies to improve employee satisfaction and productivity.

Furthermore, the project will develop interactive dashboards and reports to visualize the analyzed data, allowing HR managers to easily interpret and communicate findings to relevant stakeholders. These visualizations will facilitate data-driven decision-making and provide a comprehensive overview of the organization's HR landscape.

The anticipated outcomes of this HR analytics project include increased efficiency and effectiveness in HR operations, enhanced talent acquisition and retention strategies, improved performance management processes, and a more engaged and motivated workforce. By harnessing the power of HR data and analytics, organizations can align their HR strategies with business goals and foster a culture of continuous improvement.

Overall, this project aims to showcase the immense potential of HR analytics in optimizing HR practices, enabling organizations to make informed decisions, and ultimately driving positive outcomes for both employees and the organization as a whole.

Introduction

Why this High-Level Design Document?

The purpose of this High-Level Design (HLD) Document is to add the necessary detail to the current project description to represent a suitable model for coding. This document is also intended to help detect contradictions prior to coding, and can be used as a reference manual for how the modules interact at a high level.

The HLD will:

- Present all of the design aspects and define them in detail
- Describe the user interface being implemented
- Describe the software interfaces
- Describe the performance requirements
- Include design features and the architecture of the project

List and describe the non-functional attributes like:

- security
- reliability
- maintainability
- portability
- reusability
- application compatibility
- resource utilisation
- serviceability

Scope

The HLD documentation presents the structure of the system, such as the database architecture, application architecture (layers), application flow (Navigation), and technology architecture. The HLD uses non-technical to mildly-technical terms which should be understandable to the administrators of the system.

General Description

Problem Perspective:

HR analytics project focused on leveraging data-driven insights to enhance various aspects of human resources management within an organization. The project aims to utilize advanced analytics techniques to extract valuable information from HR data, enabling data-driven decision-making and improving overall HR processes.

Problem statement:

HR is not just about hiring people it is an ocean of its own. HR department goes through a constant journey of finding, selecting, on boarding and monitoring the right talent. You are required to use analytics concept to provide a smooth monitoring of workforce for the HR department.

To investigate how the company objective factors influence in attrition of employees, and what kind of working environment is most likely to cause attrition. You shall be looking at all variables through some charts and infer about it in my exploratory analysis. And through exploration you shall try to identify the Variables that tend to have an impact in the attrition of the most experienced and talented employees.

PROPOSED SOLUTION:

- Conduct EDA to gain initial insights into the data. Explore correlations, patterns, and trends in HR metrics to identify potential areas for improvement or further investigation with the help of excel pivot chart.

- Segment employees based on various criteria (e.g., job role, department, performance level) to identify distinct groups with unique characteristics and needs with the help of Interactive dashboard and develop employee profiles to tailor HR interventions and strategies accordingly.

- Diversity and inclusion analysis: Evaluate diversity and inclusion metrics to ensure equal opportunities and inclusivity within the organization. Identify potential biases, barriers, or underrepresented groups and develop strategies to foster a diverse and inclusive workforce.

- Create intuitive and visually appealing dashboards and reports to present key HR metrics, trends, and insights to stakeholders. Use interactive visualizations to facilitate data exploration and decision-making.

Technical requirements:

1. **Power BI Desktop:** Install Power BI Desktop, the primary tool for creating and designing reports, visualizations, and dashboards. It allows you to connect to various data sources, transform and clean the data, and build interactive visuals.

2. **Data Sources:** Identify and connect relevant data sources to Power BI. These may include HR management systems, employee surveys, performance evaluation tools, spread sheets, databases, or other HR data repositories. Ensure that the data sources are accessible and compatible with Power BI's supported connectors.

3. **Data Modelling:** Design a robust data model within Power BI Desktop. This involves creating relationships between different data tables, defining measures and calculated columns, and performing data transformations and aggregations as needed.

4. **Data Transformation:** Utilize Power Query, an embedded data transformation tool in Power BI, to perform data cleansing, shaping, and merging operations. This step ensures that the data is in the appropriate format for analysis and visualization.

5. **Data Refresh:** Establish a data refresh mechanism to keep the HR data up to date. Power BI supports various data refresh options, including scheduled refreshes, direct query, or using on-premises gateways to refresh data from local data sources.

6. **Data Visualization:** Leverage Power BI's rich collection of visualizations to create compelling HR analytics dashboards and reports. Utilize visuals such as bar charts, line charts, pie charts, tables, maps, and cards to represent HR metrics and trends effectively.

7. **Calculated Measures and KPIs:** Define calculated measures and Key Performance Indicators (KPIs) within Power BI to perform calculations and track HR performance metrics. These can include turnover rates, average time-to-fill vacancies, employee satisfaction scores, training effectiveness metrics, or any other relevant HR metrics.

8. **Drill-Down and Interactivity:** Utilize Power BI's interactive features to allow users to drill down into data at different levels of granularity. Implement slicers, filters, and hierarchical navigation to enable users to explore HR data based on various dimensions such as department, job role, or time period.

9. **Security and Sharing:** Implement appropriate security measures to ensure data confidentiality and restrict access to HR analytics reports based on user roles and permissions. Utilize Power BI's sharing capabilities to distribute reports and dashboards to relevant stakeholders within the organization.

Tools used:

Excel:

1. Excel can be used to compile and organize HR data from different sources such as HR management systems, employee surveys, performance evaluations, and payroll records. Excel's spread sheet format allows you to structure and arrange the data in a tabular format.

2. Excel provides powerful data cleaning and transformation capabilities. You can use Excel functions, formulas, and features like Text-to-Columns, Find and Replace, and Conditional Formatting to clean and standardize HR data. Excel's sorting and filtering capabilities can help identify and remove duplicates, outliers, or inconsistencies.

3. Excel offers a wide range of functions and formulas that enable data analysis in HR. You can calculate key HR metrics such as turnover rates, average performance scores, training completion rates, and compensation analysis using Excel formulas. Additionally, Excel's PivotTables and Pivot Charts allow you to summarize and visualize HR data for analysis and reporting.

Power BI:

1. Power BI allows you to connect to various HR data sources, such as HR management systems, employee surveys, performance evaluations, and other relevant databases. It supports a wide range of data connectors that enable seamless integration and consolidation of HR data into a single, centralized data model.

2. With Power BI, you can build a robust data model that defines relationships between different HR data tables. Power Query, an embedded tool in Power BI, facilitates data transformation and cleansing tasks. You can perform data shaping, filtering, merging, and calculations to prepare the HR data for analysis.

3. Power BI enables the creation of interactive HR dashboards and reports. You can leverage a rich set of visualizations (charts, graphs, maps, etc.) and customize them to represent HR metrics, trends, and insights. Power BI's drag-and-drop interface allows you to quickly design and update visualizations based on changing HR data.

Constraints:

1. The quality of HR data can vary, and it may require significant effort to ensure data accuracy, completeness, consistency, and relevance. Inaccurate or incomplete data can impact the reliability and validity of the analytics results and insights.

2. Integrating HR data from multiple sources can be complex, especially if the data is stored in different formats, databases, or systems. Organizations may need to invest time and resources in data mapping, data cleansing, and resolving data inconsistencies to ensure seamless integration.

3. HR data often contains sensitive and confidential information, such as personal employee data, salary details, or performance evaluations. Adhering to data privacy regulations and ensuring data security while handling HR data is crucial. Organizations must implement appropriate access controls and encryption mechanisms to protect data privacy.

Assumptions:

1. It is assumed that the HR data collected from various sources, such as HR management systems or employee surveys, is accurate and reliable. However, data entry errors, inconsistencies, or missing data can occur. Organizations should implement data validation and cleansing processes to address data quality issues.

2. It is assumed that the HR data includes all relevant information necessary for the analysis. However, there may be cases where certain data elements are missing or not captured in the available data sources. This can impact the comprehensiveness of the analysis and may require additional data collection efforts.

3. It is assumed that the HR data is consistent across different sources and over time. However, inconsistencies in data formats, naming conventions, or definitions can arise when integrating data from multiple systems. Organizations should ensure data mapping and alignment to maintain consistency throughout the analysis.

Design detail:

Process Flow chart

Power BI Architecture
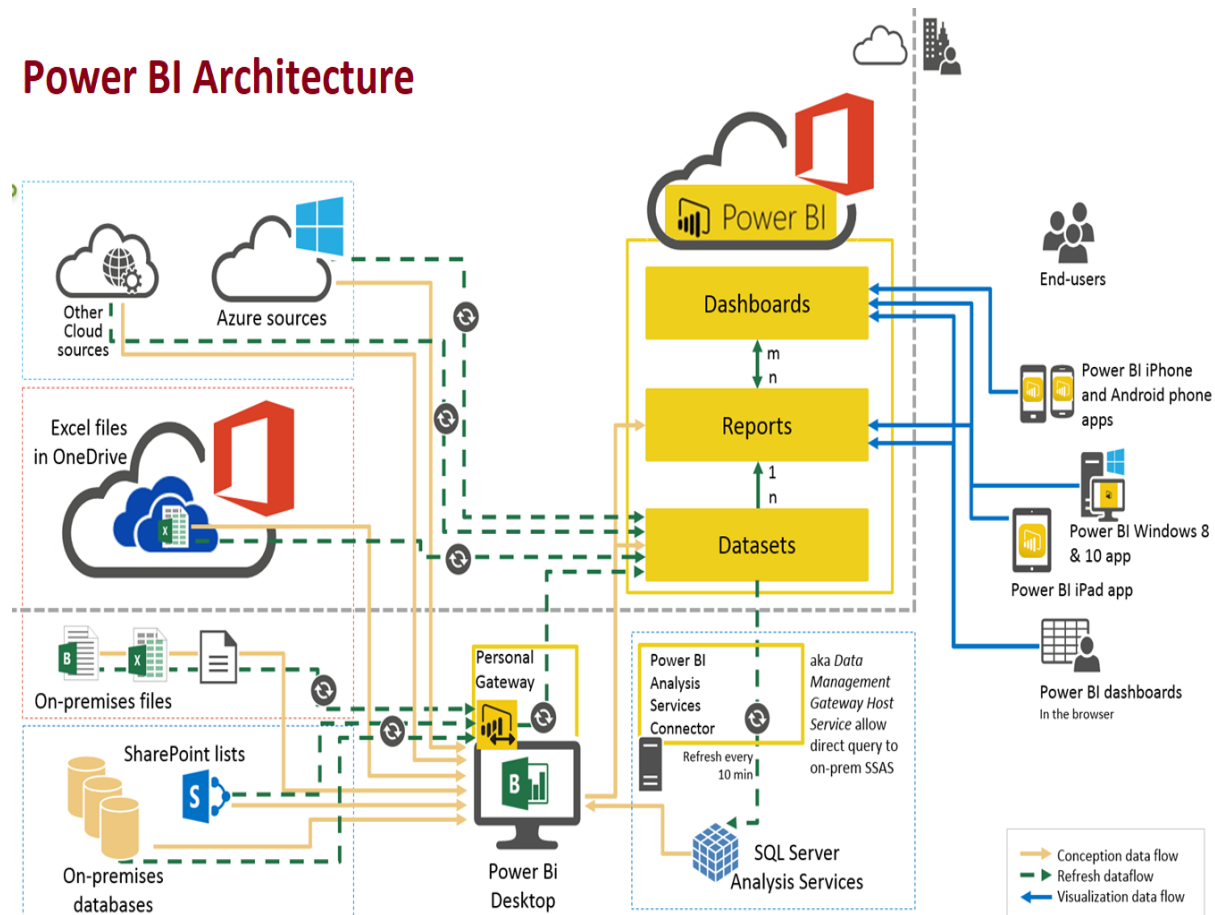
How does Power Bi Work?

- The architecture of Power Bi is designed to connect different data sources securely.
- Data Server is the first layer in the architecture. It helps Power Bi to connect data in various heterogeneous environments.
- Data connector is the second layer. It helps to connect to various databases using its ODBC connector.
- Power Bi can connect the real time live data by connecting the database directly. It can also extract a local copy of data through its in-memory data store for faster processing.
- The application server is used for authentications and authorizations.
- Data Server is a centralized data management system used in the architecture.
- A gateway is used to distribute the processes into different components.
- The fourth layers of the architecture are the clients, such as Power BI Desktop, Web, and Mobile.

Deployment:

- The first step in the deployment process is to develop and test your Power BI content. This includes creating reports, dashboards, and data models using Power BI Desktop. You can connect to data sources, transform and model the data, and design visualizations to meet your analysis requirements. During the development phase, it's important to thoroughly test your content to ensure accuracy and functionality.

- Once your Power BI content is ready, you can publish it to the Power BI Service. The Power BI Service is a cloud-based platform where you can store and share your reports, dashboards, and datasets. To publish your content, you can save your Power BI Desktop files (.pbix) and upload them to the Power BI Service.

- In the Power BI Service, you can configure security settings and define access permissions for your content. You can control who can view, edit, or share your reports and dashboards. Power BI provides options to share content with specific individuals, groups, or the entire organization. You can also set up row-level security to restrict data access based on user roles or attributes.

Key performance indicator:

Key Performance Indicators (KPIs) in an HR data analytics project using Power BI are measurable metrics that help organizations track and assess their HR performance and effectiveness. KPIs provide insights into various aspects of HR operations, employee engagement, workforce productivity, and other critical HR areas. Power BI can be used to visualize and analyze these KPIs, enabling organizations to make data-driven decisions. Here are some common HR KPIs that can be tracked using Power BI:

- Employee Turnover Rate: This KPI measures the rate at which employees leave the organization. It helps assess the effectiveness of talent retention strategies and identify areas for improvement.

- Time-to-Fill: This KPI measures the time taken to fill job vacancies. It provides insights into the efficiency of the recruitment process and helps optimize hiring workflows.

- Employee Engagement: KPIs related to employee engagement, such as employee satisfaction scores, engagement survey results, or participation in employee development programs; help evaluate the level of employee satisfaction and commitment.

- HR Cost per Employee: This KPI measures the total HR expenditure divided by the number of employees. It provides insights into HR cost efficiency and helps in budgeting and resource allocation.

- Power BI allows organizations to create visually appealing dashboards and reports that consolidate and visualize these HR KPIs. By monitoring and analyzing these KPIs, organizations can gain valuable insights to make informed decisions, improve HR processes, and drive organizational performance.

Conclusion:

1. Power BI empowers HR professionals to access and analyze vast amounts of HR data quickly and effectively. By visualizing key HR metrics and trends, Power BI enables informed decision-making across various HR functions, including recruitment, employee engagement, talent management, and workforce planning.

2. Power BI's interactive dashboards and reports allow HR teams to explore data and identify meaningful patterns and correlations. This leads to actionable insights that can drive strategic initiatives, such as enhancing employee engagement, reducing turnover, or optimizing training and development programs.

4. Power BI's rich visualization capabilities allow HR professionals to present HR data in a visually compelling manner. Interactive charts, graphs, and maps make it easier to communicate complex HR insights to stakeholders, enabling effective data storytelling and enhancing data-driven discussions.

6. Power BI enables collaboration and knowledge sharing within HR teams and across the organization. HR professionals can collaborate on reports, share insights, and provide access to relevant stakeholders, fostering a data-driven culture and aligning HR strategies with business objectives.

7. Power BI offers robust security features, including role-based access controls, data encryption, and compliance with industry standards. This ensures the protection of sensitive HR data and compliance with data privacy regulations.

By leveraging Power BI's capabilities, organizations can unlock the full potential of their HR data, gain valuable insights, and drive evidence-based decision-making. However, it is important to address data quality, ensure stakeholder buy-in, and invest in the necessary training and resources to maximize the benefits of HR data analytics using Power BI.