**Analytics and Visualisation for Managers and Consultants**

**Report On the Employee Data Dashboard**

**Dashboard Link:-** [**https://app.powerbi.com/view?r=eyJrIjoiZTJhMWE1NDYtYTcyOC00MTllLTgzZGYtMDA4OTA0ZDIzNGNkIiwidCI6ImI5YmMzOTZiLTA4NzYtNDdkOS1hYWFkLWJhNDU1ZDk5MjdlYyJ9**](https://app.powerbi.com/view?r=eyJrIjoiZTJhMWE1NDYtYTcyOC00MTllLTgzZGYtMDA4OTA0ZDIzNGNkIiwidCI6ImI5YmMzOTZiLTA4NzYtNDdkOS1hYWFkLWJhNDU1ZDk5MjdlYyJ9)

**Introduction**

Acquiring new employees has evolved into a complex and laborious process for enterprises, necessitating careful consideration of numerous factors. The HR team faces the challenge of sifting through a vast amount of employee data to make well-informed decisions. These decisions hinge on various variables, including qualifications for the position, attrition rates, hiring procedures, diversity and inclusion aspects, salary and benefits structures, background checks, and overall employee evaluations. To facilitate HR decision-making, it is essential to present the data accurately in a comprehensive manner. The Employee Data Dashboard addresses this need by incorporating crucial elements such as bonuses, past work responsibilities, education qualifications, estimated wage ranges, age, and experience levels. Analysing employee patterns enables the categorization of reasons leading to dissatisfaction, limited career growth opportunities, poor management, work-life balance issues, job-related stress, and lack of recognition or appreciation, among others. The design of the dashboard considers the significant factors impacting employees, ensuring a meaningful and insightful analysis of their data. The visualization caters to the requirements of the audience, making it user-friendly and easy to comprehend. The dashboard and accompanying report offer valuable insights, aiding in in-depth analysis and sound decision-making. In the validation process, the dashboard's functionality and accuracy will be assessed through rigorous testing. User feedback and expert evaluations will be solicited to ensure the dashboard aligns effectively with HR needs and goals. By leveraging the dashboard and its reporting capabilities, users can gain valuable insights into employee-related trends and patterns, empowering them to make informed and strategic decisions to enhance overall workforce management.

**Data**

The data set I chose was from Kaggle. I started my research thinking of working on operations, and later looking at the following data which had unique variables gave me a great latitude to work on a wide range of use case scenarios. The attributes in the data set are employee\_id, age, age\_group, and attrition which represent employees leaving a company for a variety of reasons, such as retirement, resignation, or termination, and are referred to as attrition, business\_travel,daily\_rate, the department which represents the employee’s department, distance from home, education, employee number, gender, job level, job role, job satisfaction, marital status, monthly income, salary slab, monthly rate number of companies worked, total working years, training times last year, work-life balance, years at the company, years in the current role, years since last promotion years with the current manager, etc. these attribute names are self-explanatory. And it was a noise-free dataset which helped in establishing a relationship while designing the dashboard (Sachs, T. (2023).

**Data Cleaning and Preparation**

Since the data I chose had less noise. I started my dashboard by importing the Excel sheet in power bi where I manipulated a few attributes like converting from text format to whole number which is necessary for visualization in the dashboard. Then I also dropped the unnecessary columns. Lastly, I created the new binary column attrition\_count which I used for many functions and visualization in the dashboard. Now with this data, I started the design process.

**Design Process**

For my visualisation, I used Munzner’s Four Level Validation where I will be discussing Domain Problem, Task and Data Abstraction, Visual Encoding, Interaction Design, Algorithm, and System Implementation. Overall, Munzner's validation framework is a useful tool for analysing, planning, conveying, and teaching visualisation design. The validation will assist in examining the components needed for the new visualisation. In my dashboard(V,2016).

Graphical user interface

Description automatically generated

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**Encode and Manipulation**

I have used KPI plots to visualise the key performance indicators, the indicators I used in the dashboard are the count of employees, attrition count, and attrition rate which represents the average attrition rate, average age, average salary, and total working years in the company. I have also shown the plots arguing attrition vs job role, education, salary range, age, gender, work experience, and job satisfaction based on job role using these plots and interactive dashboard the management or HR can see and take the insights to be in control of attrition. Secondly, I have used a filter function for switching between the departments using this manipulation the end user can switch between different plots the manipulation will reflect the results like how to experience the impacts of attrition, does job role impact over attrition, is salary range a factor for attrition, attrition by gender, job satisfaction based on roles where satisfaction is measured on a scale of 1 – 4 here management and HR can see the job satisfaction of the employees in the certain field which in terms are in relations with gender, salary, etc. These features and functions can be used by the end user to view and analyse to make the decision for the tasks to be performed (Sachs, T. (2023)).

**First Level of Validation: -Domain Situation**

At this stage, the domain problem is examined, the data's properties are understood, and the wants and objectives of the user are determined. Making sure the visualisation design meets the needs of the user and is applicable to the domain concern. The query asked by this level is, who is the target audience? And observe their domain problem providing a visualisation solution. Our target audience will be HR. It might be difficult to replace an employee when they leave since their skills, knowledge, and experience go with them. This is called attrition. And the workload of the management and HR will also be increased resulting in high costs for hiring and training the new employee. In our visualisation. The use of KPIs will help the target users to use and manipulate the visualisation to generate insights about the use case (Van Vulpen, E. (2021).

**Second Level of Validation: - Data/task abstraction**

At this level, the user's specific duties are identified, and the data is abstracted to serve those tasks. To support the user's responsibilities, this level entails creating the data structure as well as filtering, sorting, and aggregating the data. The queries asked by these levels are what is shown? And what is the user looking at? Secondly, I have used a filter function for switching between the departments which will be reflected in every single plot and can be used by HR to gather insights about the employees in that respective field for knowing their behaviour of the employees and what all factors will involve in attrition can be seen from attrition. Looking at the dashboard the user will know about the tasks which he can perform using the dashboard.

**Third Level of Validation: - Visual Encoding/Interaction Idiom**

At this level, the data must be represented, and the user's duties must be supported by the selection of the most appropriate visual encoding and interaction strategies. The visual encoding must be precise, understandable, and effective, and the interface design must be simple and straightforward. The query asked by this level is how it is shown. Visualization tasks can be performed by looking at the plots and interactions can be made. I have ensured that the plotted graphs have been chosen purposefully based on calculations to make data user accessible. All the legends and colors chosen can help attract users to indulge and extract meaningful insights. Therefore, by following the above procedures I have made sure that ‘Visual Encoding’ has been implemented for the designed database.

**Fourth Level of Validation: - Algorithm**

The technical execution of the visualization design is covered at this level, including the software system that supports the visualization and the algorithms used to create the visualizations. Here we have implemented the operations in power bi where we can switch between the filters and the changes will be reflected instantly over the dashboard. The Power BI platform comprises of internal query editor which allows us to clean the data and perform the necessary changes. After performing the required operations, I allocated the plots in such a way that each of the output KPIs will reflect in a methodological algorithm. This ensures that there is data flow, and it will help in pointing out the key factors of any created dashboard. By carefully choosing the column-level data against each graph I have made that there is consistency throughout the visualization.

**Evaluation And Conclusion**

In summary, the designed dashboard presents attrition factors on a unified platform that is adaptable and easily accessible. Its primary target audience is the HR department, aiming to provide them with a simplified and comprehensive view of a wide range of data. The visualization showcases attrition factors across various fields, with KPIs enabling the identification of key indicators responsible for attrition. By leveraging bar graphs, donut charts, stacked bar graphs, and area graphs, along with slicers for enhanced interactivity, the dashboard fosters user engagement and facilitates data-driven insights for HR operations. The incorporation of distinct colors to differentiate between different fields enhances user comprehension and aids in distinguishing relevant information. During the design process, the main potential threats to validity primarily relate to missing data or data type errors, which can be mitigated by pre-processing and data cleansing. To ensure the effectiveness and usability of the dashboard, "User Testing" will be employed, involving real-time feedback from a selected group of users. This iterative process aims to evaluate the functionality and general efficacy of the Employee data dashboard, allowing for refinements and adjustments to align with user needs. Additionally, performance metrics will be monitored and benchmarked to identify areas for improvement. Furthermore, continuous evaluation and expert feedback will be sought to pinpoint any shortcomings and areas requiring enhancement. A holistic approach, encompassing both user feedback and objective performance indicators, will be employed to assess the sales dashboard's effectiveness. This strategy ensures its sustained performance and adaptability to meet the evolving demands of users.

**References**

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