# Project Report

### Title: Corporate Employee Attrition Analytics

### Team ID: PNT2022TMID14579

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## Table of Contents

# 1. INTRODUCTION

## 1.1 Project Overview:

This project aims to discover insights that will help a company make conscious decision about hiring talents and improve employee satisfaction and retention. The report will go through exploratory data analysis, data preparation, and use IBM Cognos Analytics tool to drive the decision-making process. The target audience of this project would be executives or Human Resources leader who are interested in uncovering insights around employee attrition. The modeling of employee attrition prediction will help the target audience make an informed decision about why employees attrition on a broad level and consider options that can prevent attrition of talents.

## 1.2 Purpose:

One of the keys to success in an organization is the ability to hire and retain great talent. It helps minimize the costs in recruiting and contributes to the overall growth of the business. So, the main purpose of this project is to find the factors causing the attrition in their organizations.

# 2. LITERATURE SURVEY

## 2.1 Existing Problem:

- Work culture in the organization
- Less work life balance
- Employee job satisfaction in the organization
- Lack of recognition and better pay
- Huge pressure on employees
- Not allocating the employees based on their skills and interest to the department.

The above-mentioned points are the major cause for the employees leaving the organization.

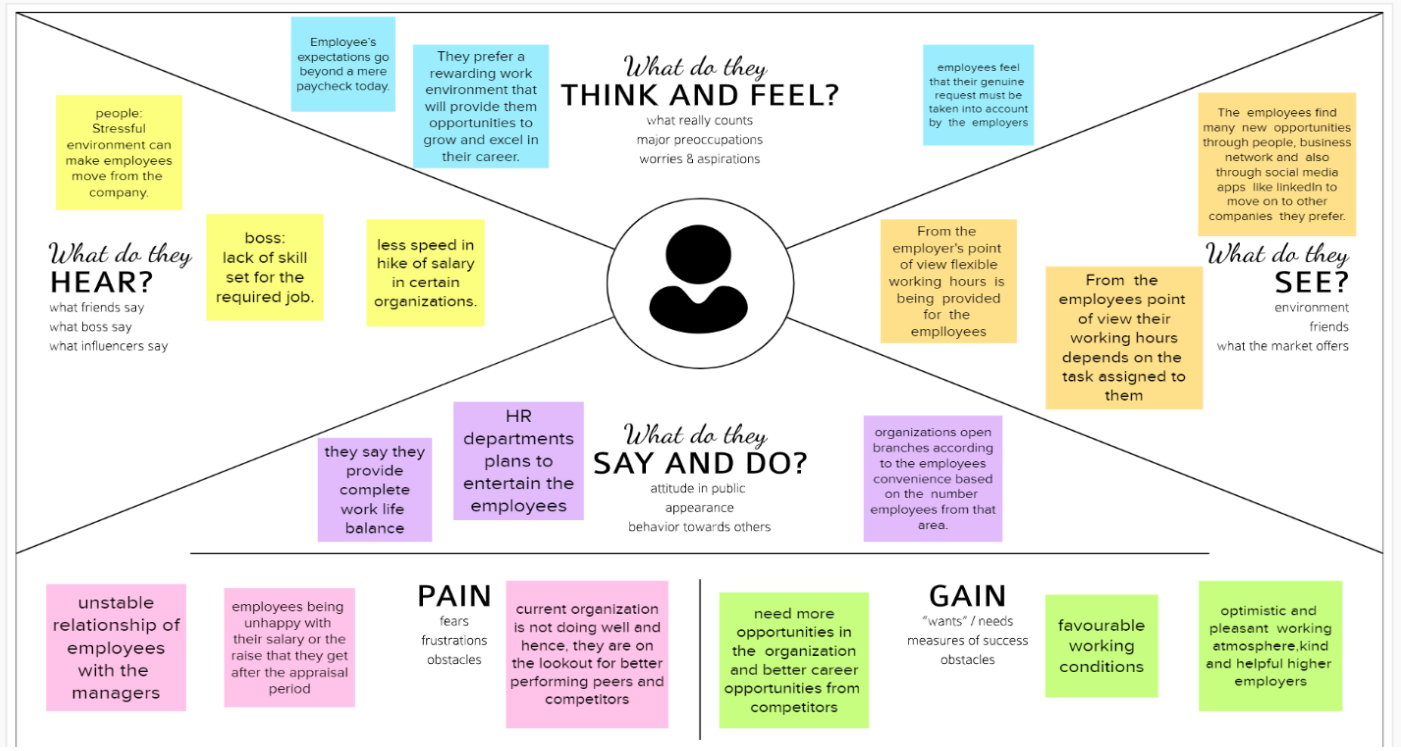
### 2.2 References:


- Setiawan, I., Suprihanto, S., Nugraha, A. C., & Hutahaean, J. (2020, April). HR analytics: Employee attrition analysis using logistic regression. In IOP Conference Series: Materials Science and Engineering (Vol. 830, No. 3, p. 032001). IOP Publishing.
- Ganthi, Lok Sundar, et al. "Employee Attrition Prediction Using Machine Learning Algorithms." Proceedings of International Conference on Data Science and Applications. Springer, Singapore, 2022.
- Kamath, Dr RS, Dr SS Jamsandekar, and Dr PG Naik. "Machine Learning Approach for Employee Attrition Analysis." Int. J. Trend Sci. Res. Dev., vol. Special Is, no. Special Issue-FIIIIPM2019 (2019): 62-67.
- Nagadevara, Vishnuprasad, Vasanthi Srinivasan, and Reimara Valk. "Establishing a link between employee turnover and withdrawal behaviours: Application of data mining techniques." (2008).

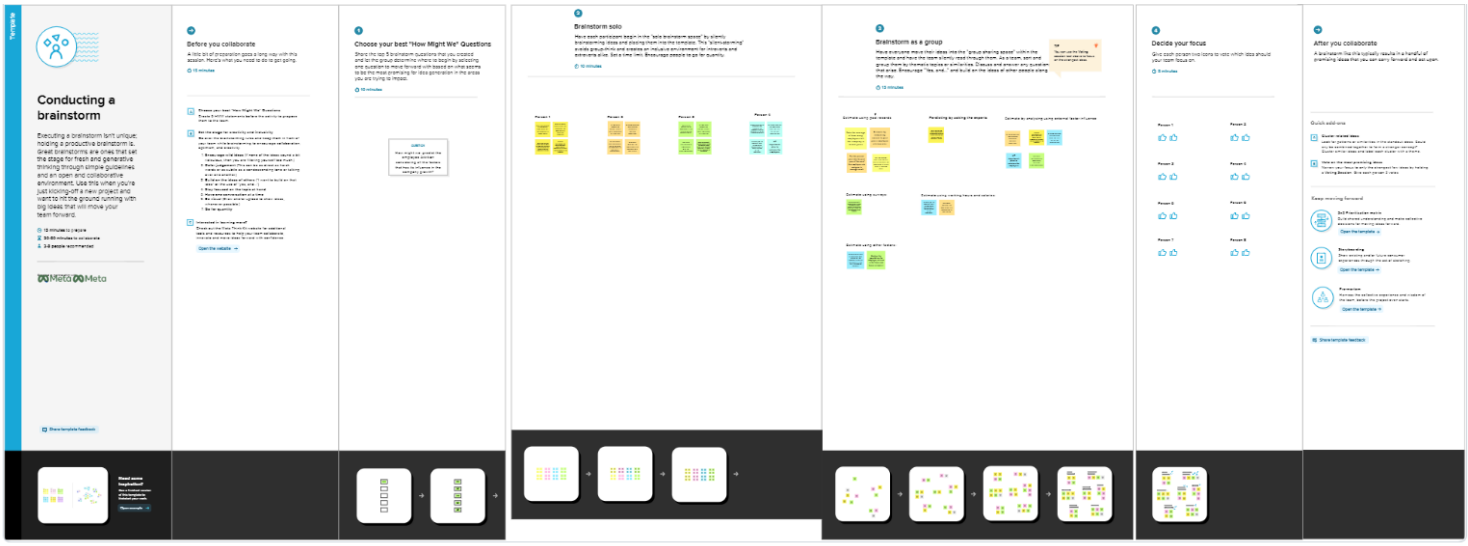

## 3. IDEATION & PROPOSED SOLUTION:

### 3.1 Empathy Map

Build empathy and keep your focus on the user by putting yourself in their shoes.



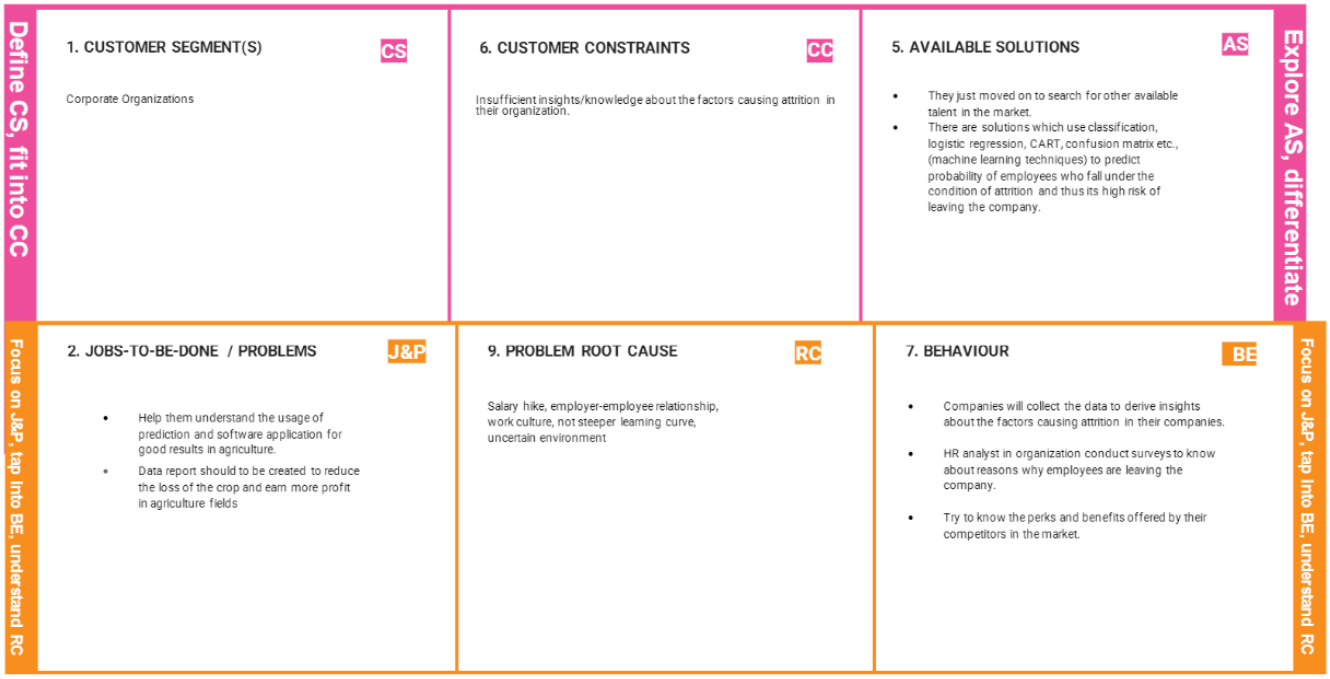

## 3.2 Ideation & Brainstorming:

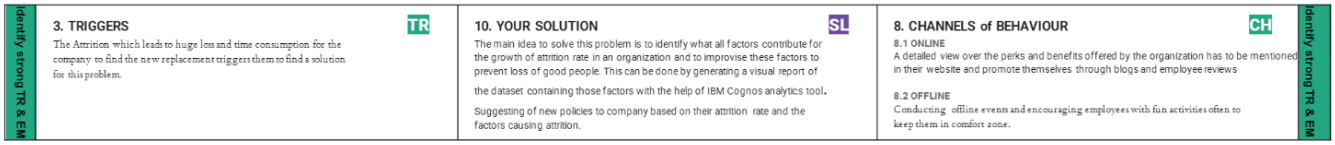


## 3.3 Proposed Solution:

The main aim is to identify what all the factors contribute for the employee attrition rate in an organization by using the gathered dataset and IBM Cognos Analytics tool for visualizing the data with different charts and deriving the insights from it. The proposed solution will help the organization analyze the causes of attrition. It will help them in retaining the employees with them.

## 3.4 Problem Solution fit:







# 4. REQUIREMENT ANALYSIS:

## 4.1 Functional Requirements:

Following are the functional requirements of the proposed solution.

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|---|---|---|
| FR-1 | Input data | • Get input from HR team<br>• Specific surveys<br>• Company records |
| FR-2 | Data Preprocessing | • Clean the data<br>• Explore the attributes |
| FR-3 | Visualization charts | Using IBM Cognos analytics, generate the required visualization charts for deriving insights |
| FR-4 | Dashboard | Preparing the final dashboard for the provided data |
| FR-5 | Storing the output | At the end, storing the solution in the filesystem/ database of users. |

## 4.2 Non-functional Requirements:

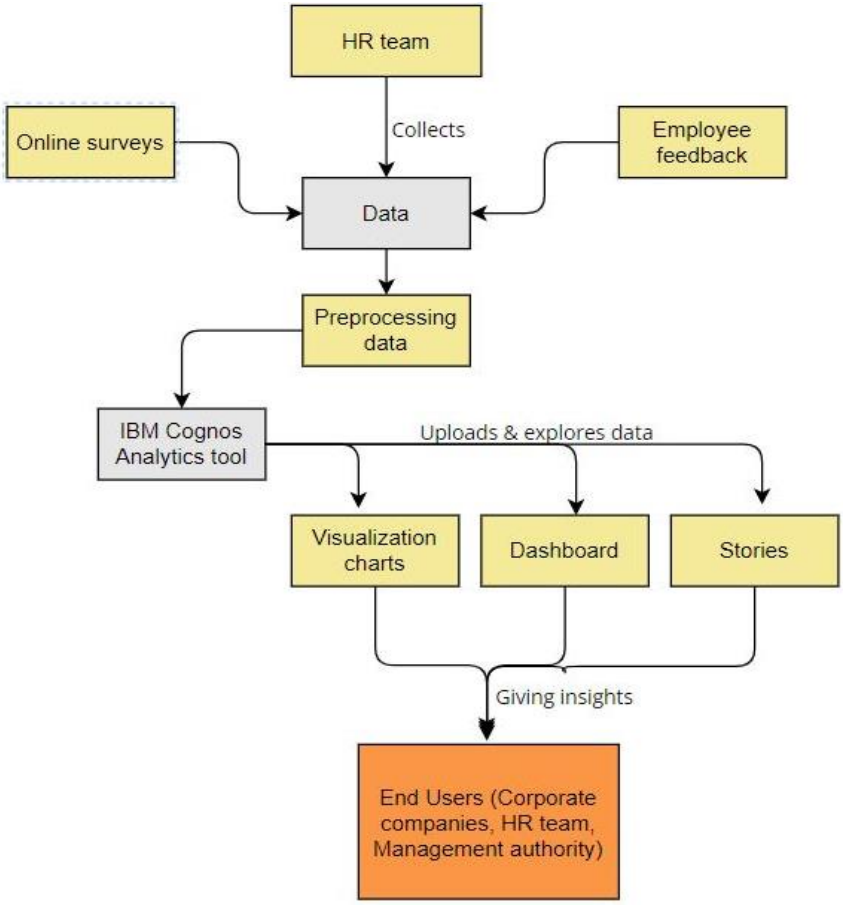
Following are the non-functional requirements of the proposed solution.

| FR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | **Usability** | Corporate companies must get a useful insight about their current attrition factors with very interactive efficient interface. |
| NFR-2 | **Security** | The data which is used for this solution building should be stored in a secure medium for security purposes. |
| NFR-3 | **Reliability** | The proposed solution model should give high accuracy insight for the end users. |
| NFR-4 | **Performance** | The model must take less time and system resource for generating the data visualizations |
| NFR-5 | **Availability** | Model should run at anytime convenient to the users and gives insights |
| NFR-6 | **Scalability** | The solution model must handle even the huge dataset provided to it. |

## 5. PROJECT DESIGN:

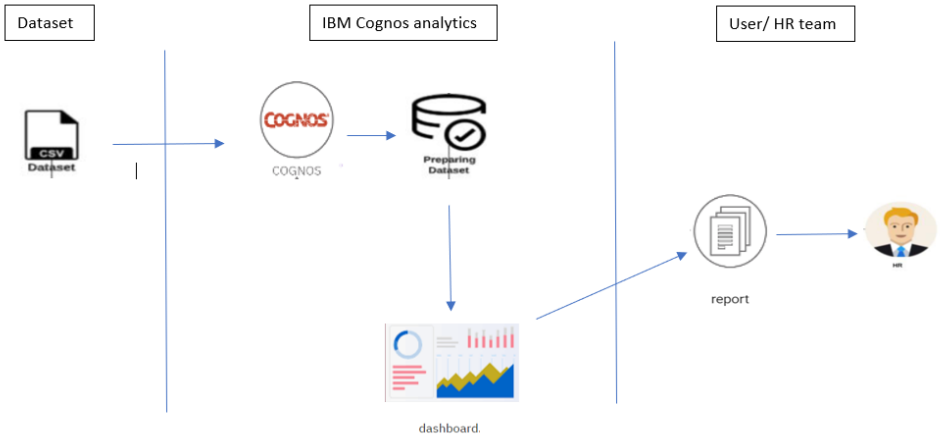
### 5.1 Data Flow Diagram:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.




## 5.2 Solution & Technical Architecture:

**Technical Architecture:**



## 6. PROJECT PLANNING & SCHEDULING:

### 6.1 Sprint Planning

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|---|---|---|---|---|---|---|
| Sprint-1 | Understanding of the dataset | USN-1 | As a user, I collect the relevant data through online surveys, employee feedback and company records | 2 | High | Dhaarani |
| Sprint-2 | Data module creation & Exploration | USN-2 | As a user, I need to pre-process the collected data | 1 | High | Soundarya, Dhivya, Padma |
| Sprint-3 | Visualization charts | USN-3 | As a user, I visualize the data through different charts for deriving insights | 2 | Medium | Dhaarani, Dhivya |
| Sprint-4 | Final Dashboard & exporting it | USN-4 | As a user, I can get the final dashboard which provides factors causing attrition | 2 | Medium | Soundarya, Padma |

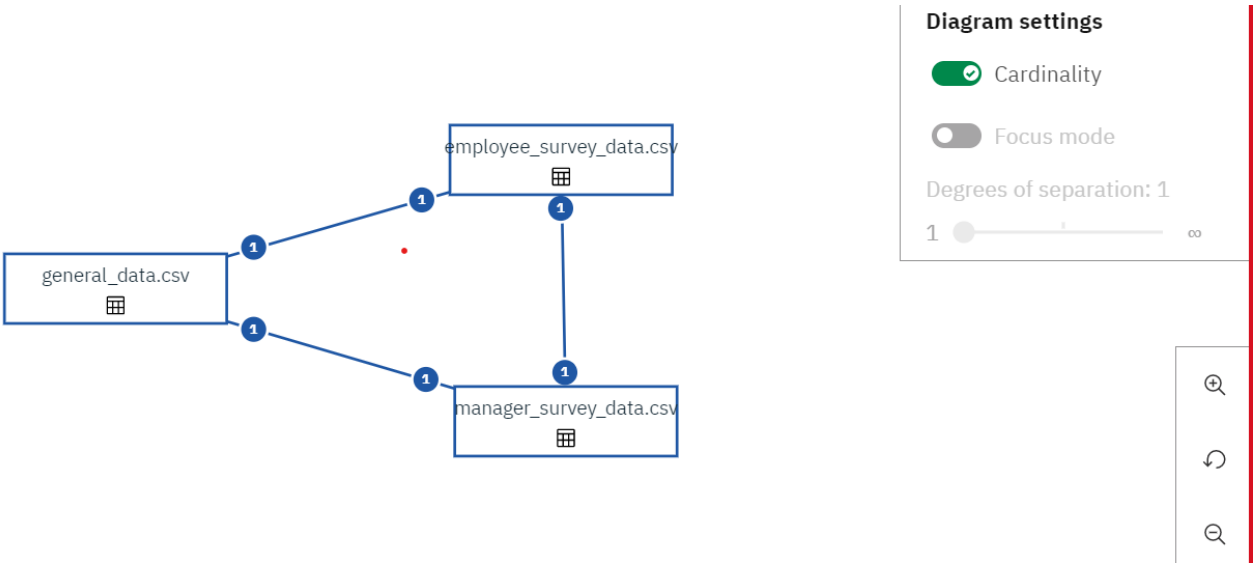
### 6.2 Sprint Delivery Schedule:

| Sprint | Total Story Points | Duration | Sprint Start Date | Sprint End Date (Planned) | Story Points Completed (as on Planned End Date) | Sprint Release Date (Actual) |
|---|---|---|---|---|---|---|
| Sprint-1 | 20 | 6 Days | 24 Oct 2022 | 29 Oct 2022 | 29 Oct 2022 | 01Nov 2022 |
| Sprint-2 | 20 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | 05 Nov 2022 | 06 Nov 2022 |
| Sprint-3 | 20 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | 08 Nov 2022 | 09 Nov 2022 |
| Sprint-4 | 20 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | 11 Nov 2022 | 12 Nov 2022 |

## 7. SOLUTION:

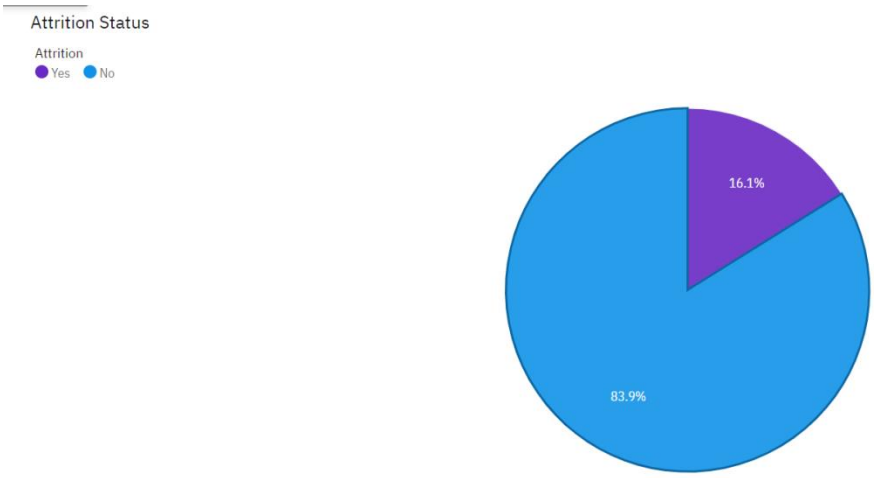
Here, we have created the visualization charts for the gathered dataset. Through that we have analyzed the factors causing the attrition in the organization.

DATA MODULE:

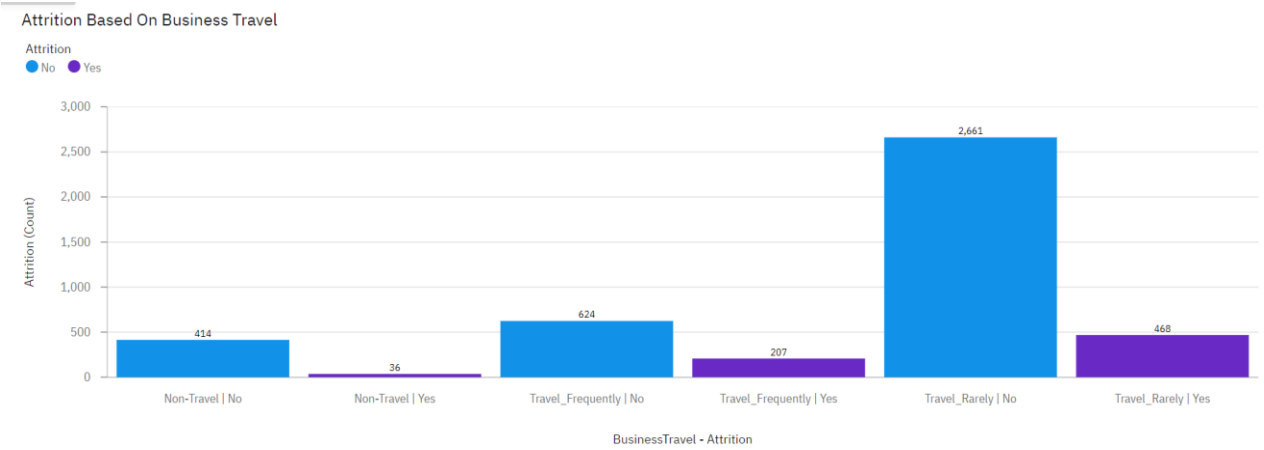



Visualization charts:

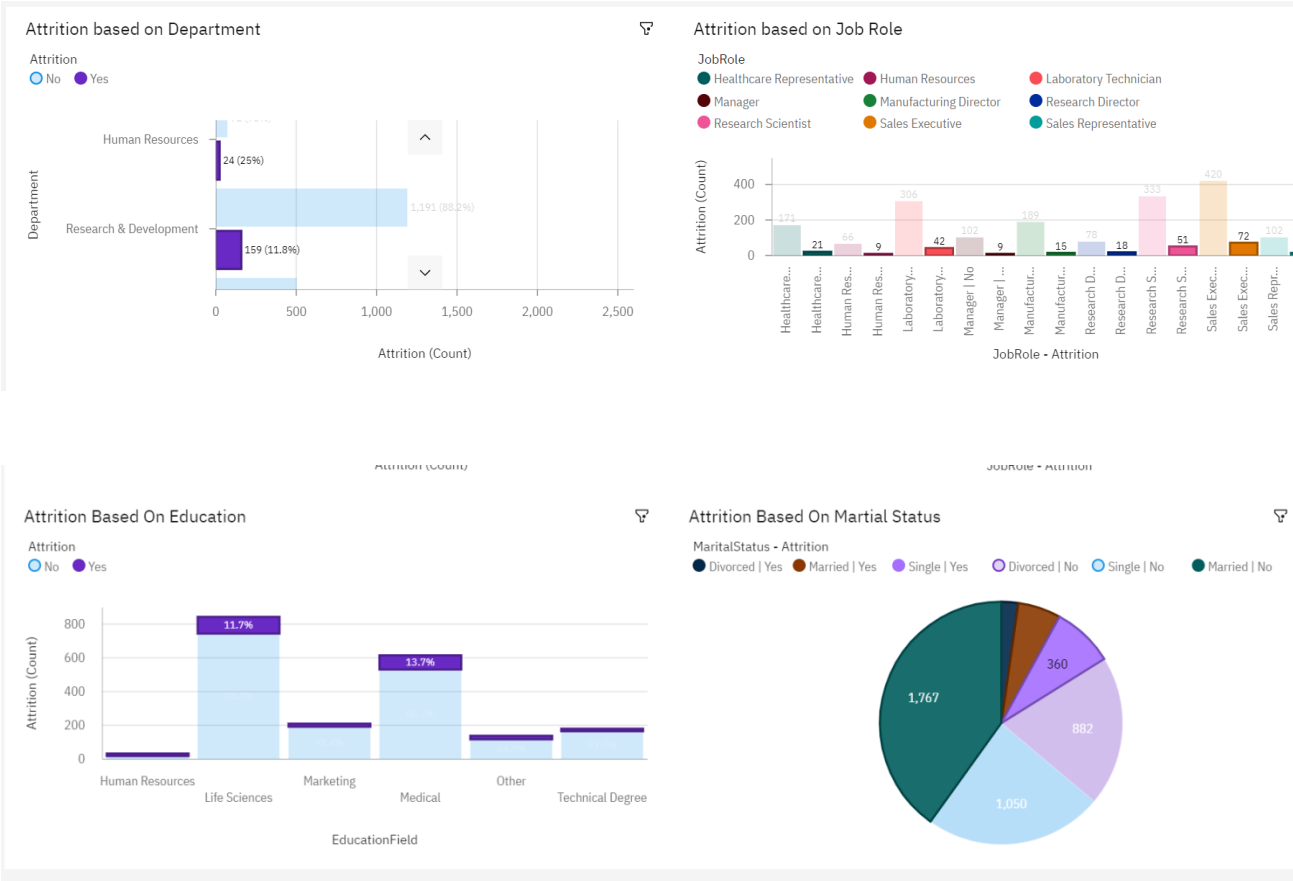
- Building of Visualizations with Analysis based on Data distribution.
- Attrition status



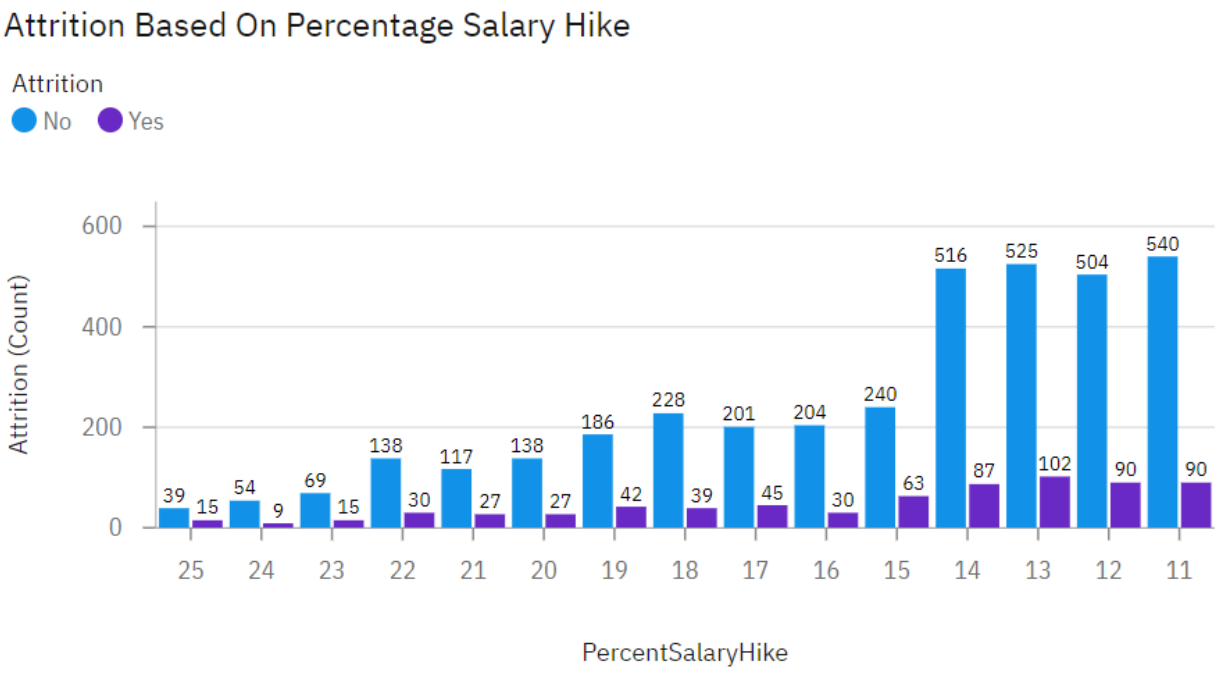
- Attrition by Business Travel



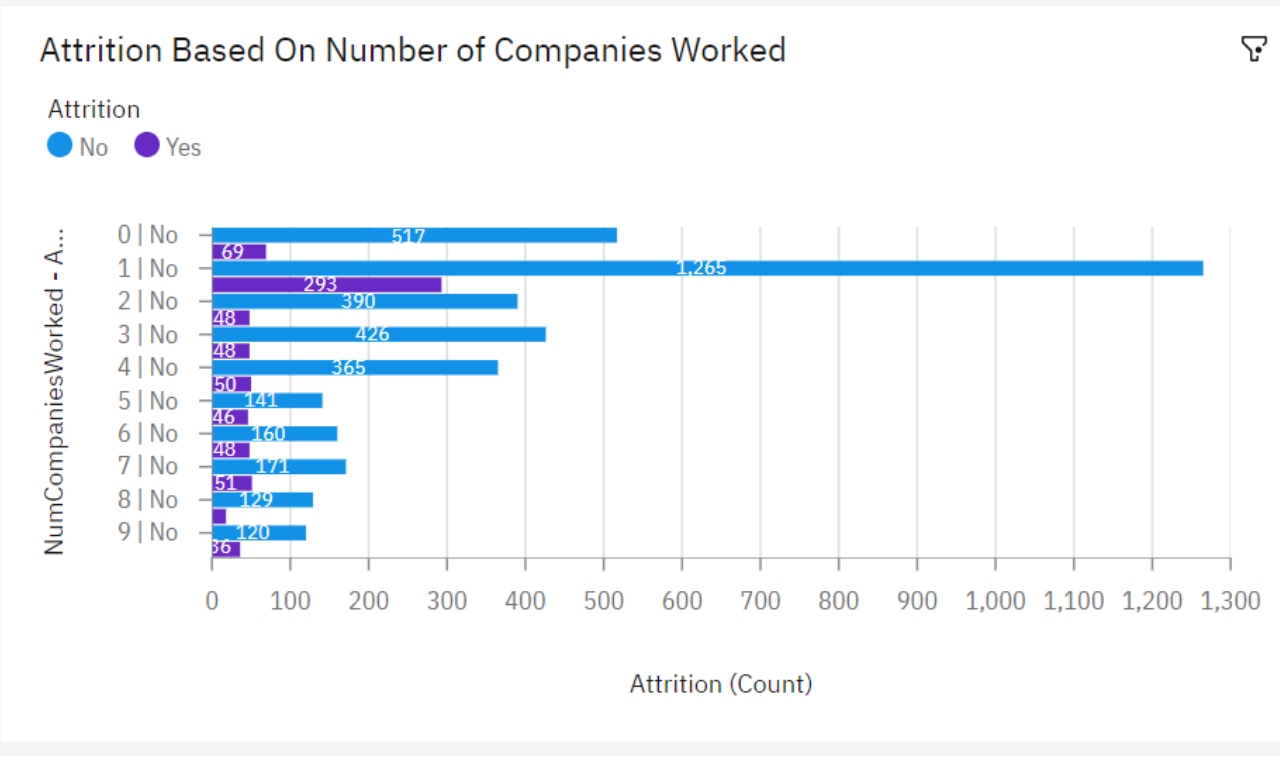

- Attrition by Department, Job Role, Education Level and Marital Status



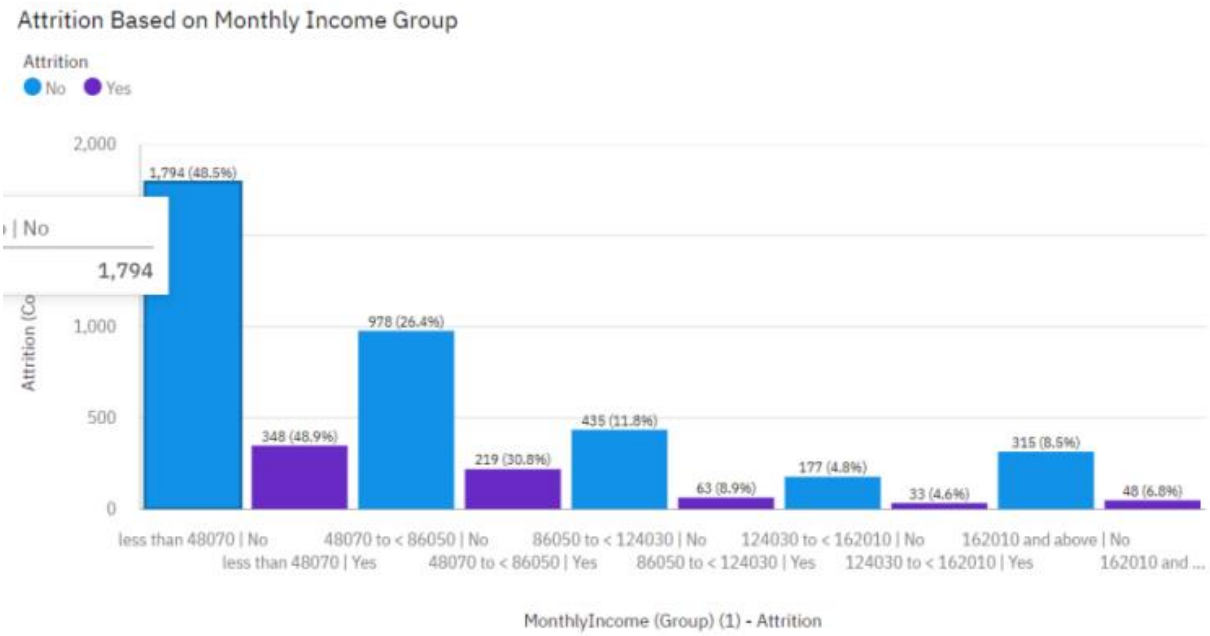

- Attrition by Salary Hike Percent



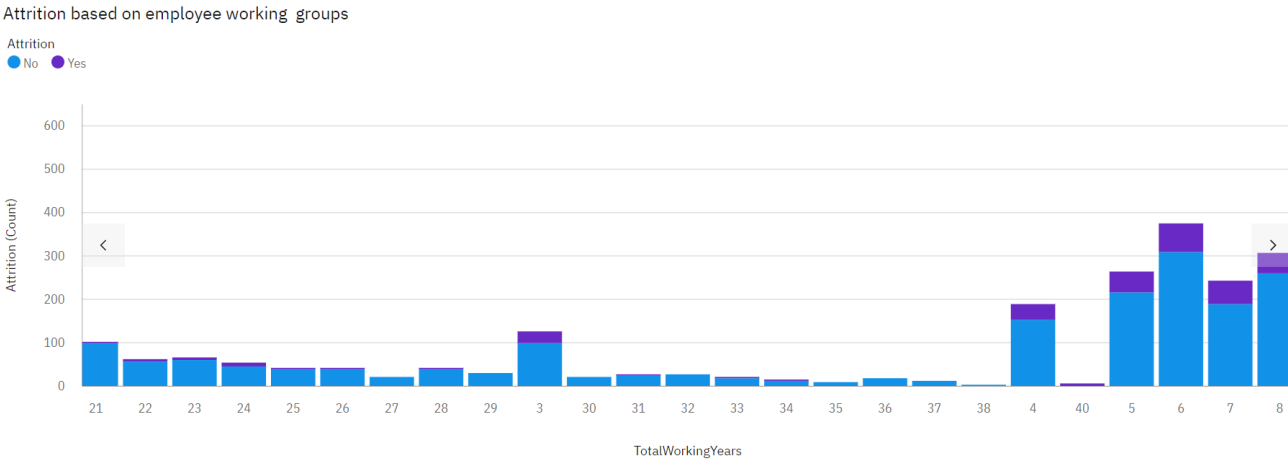

- Attrition by No. of Companies Worked




- Attrition by Income Groups




- Dashboard of Attrition of Employees based on Employment details

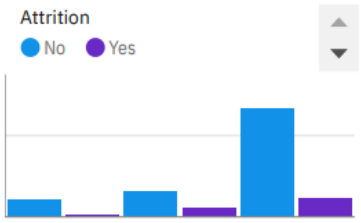



## 8. Results:

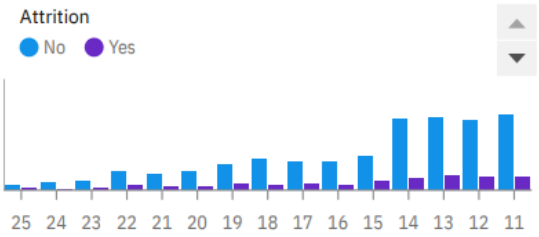
## Dashboard 1

### Attrition Status

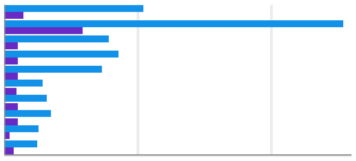

### Attrition Based On Business Travel



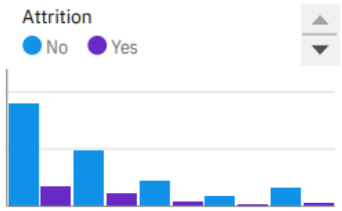

### Attrition Based On Percentage Salary Hike



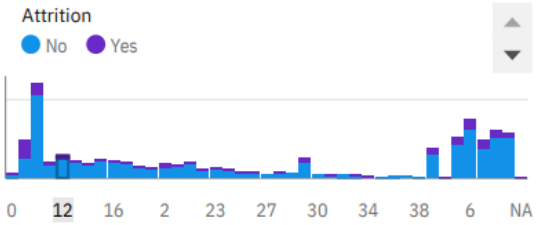

### Attrition Based On Number of Companies Worked



### Attrition Based on Monthly Income Group

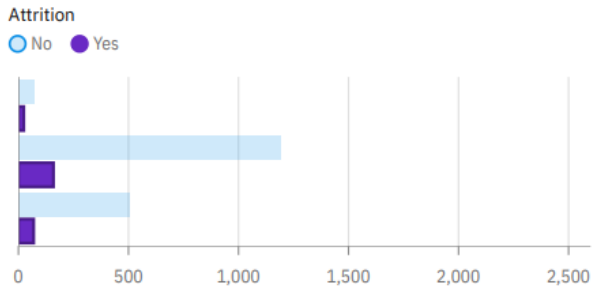



### Attrition based on employee working groups

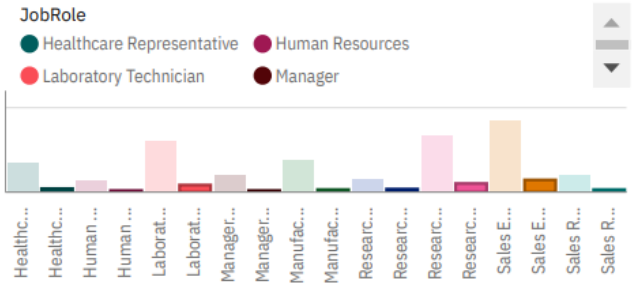



## Attrition based on Department,Job Role,Education ,Martial Status

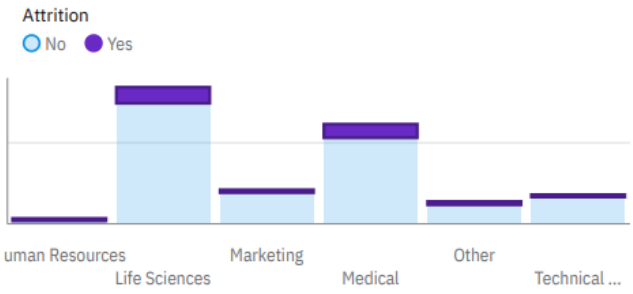
### Attrition based on Department



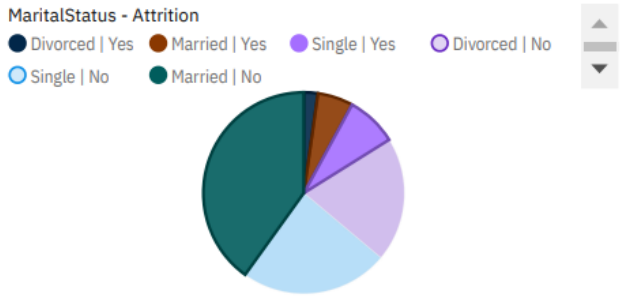

### Attrition based on Job Role




### Attrition Based On Education




### Attrition Based On Martial Status



## 9. Advantages and Disadvantages:

Advantages:

- It helps organizations to understand the employee's mindset
- Enhance the work culture
- Increase the employee benefits and perks
- Come-up with employee friendly policies

Disadvantages:

- Losing engaged and hard-working staff.
- Rehiring time and expenses.
- Indicating existing staffs' dissatisfaction and unhappiness.
- Pressurizing remaining staff.
- Delaying other business plans and developments.

## 10. Conclusion

At the start of this project, we identified the importance of talent retention for a company and collected a dataset on employee information and attrition. We then completed an exploratory data analysis, creating visualizations charts to understand the demographics and features of employees who left the organization. Then we concluded that there are some variables that are important factors in an employee's decision to attrit such as education fields, job roles, satisfaction, etc.The insights uncovered through analysis can be used to develop action items that help prevent future loss of talent.

## 11. Future Scope

Further enhancements can be made by collecting much more data from the employees and building an AI based tool to predict the attrition in the organization.

That tool may be a commercial one which provides service for the entire business sector. By providing the necessary insights and some tips and suggestions to help the organizations retain their employees in the organization.