GROUP 1

EMPLOYEE RETENTION

HR ANALYTICS

GROUP MEMBERS

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INTRODUCTION

- We have given two data set named HR 1 & HR 2 of excel file and each data set contains 50K records each.
- Used power query option to merge the two data sets using common column (employee number in HR1 and employee id in HR2) and for data manipulating.

KPI 1

Average Attrition rate for all Departments

INFERENCE: The company faces an overall attrition issue with an average rate of 10.78%. Hardware and Human Resources departments have significantly higher attrition rates compared to other departments like Research & Development, Sales, Software, and Support. This suggests potential retention challenges in specific departments and a need for company-wide strategies to improve employee retention.

Department	Average Attrition rate
Hardware	16.09%
Human Resources	16.72%
Research & Development	8.52%
Sales	8.46%
Software	8.43%
Support	8.34%

Job role	Female	Male
Developer	114.00	114.36
Healthcare Representative	116.00	116.59
Human Resources	115.23	117.14
Laboratory Technician	115.12	117.20
Manager	114.31	115.78
Manufacturing Director	115.46	116.74
Research Director	116.31	114.40
Research Scientist	115.93	114.45
Sales Executive	116.22	114.51
Sales Representative	113.89	115.02
Grand Total	**115.2532777**	**115.6118**

KPI 2

Average Hourly rate of Male Research Scientist

INFERENCE: The KPI 2 reveals average salaries for various job roles, with males generally earning slightly more than females. The salary gap varies across roles, with some jobs exhibiting larger differences than others. Further investigation is necessary to pinpoint the factors contributing to these potential gender-based pay disparities, including experience, qualifications, performance, and the specific job roles where the gaps are more pronounced.

KPI 3

Attrition rate Vs Monthly income stats

INFERENCE: The KPI 3 shows retention and attrition rates across different monthly income intervals. Overall, attrition rates are slightly higher than retention rates across all income intervals, suggesting a potential challenge for the organization in retaining employees. While the differences between retention and attrition are relatively small, it's worth noting that the highest retention rate is observed in the 31001-41000 income interval, which might indicate that employees in this income bracket are more satisfied and less likely to leave the company.

Monthly income intervals	Retention	Attrition
1001-11000	9.93%	10.04%
11001-21000	9.91%	9.88%
21001-31000	10.04%	10.03%
31001-41000	10.13%	10.12%
41001-51000	9.78%	10.14%

Department	Average of Years At Company
Hardware	10.81
Human Resources	10.77
Research & Development	10.68
Sales	10.84
Software	10.78
Support	10.74

KPI 4

Average working years for each Department

INFERENCE: The KPI 4 shows the average years of service for employees in different departments. Overall, employees across all departments have a relatively long tenure with the company, averaging around 10.7 years. Hardware and Sales departments have slightly higher average tenures (10.81 and 10.84 years, respectively) compared to other departments, suggesting that employees in these areas may have a stronger sense of loyalty or stability within the organization.

KPI 5

Job Role Vs Work life balance

INFERENCE: The KPI 5 shows the average work-life balance rating for different job roles, with scores ranging from 2.47 to 2.51. Overall, employees across all job roles seem to perceive their work-life balance as relatively good, with scores consistently around 2.5. This suggests that the company may have initiatives or policies in place that support a healthy work-life balance for its employees.

Job role	Average of Work Life Balance
Developer	2.51
Healthcare Representative	2.51
Human Resources	2.51
Laboratory Technician	2.49
Manager	2.50
Manufacturing Director	2.50
Research Director	2.49
Research Scientist	2.51
Sales Executive	2.47
Sales Representative	2.50

Years since last promotion	Attrition rate
1-5	63.27%
6-10	19.21%
11-15	9.17%
16-20	4.59%
21-25	2.28%
26-30	1.04%
31-35	0.39%
36-40	0.05%

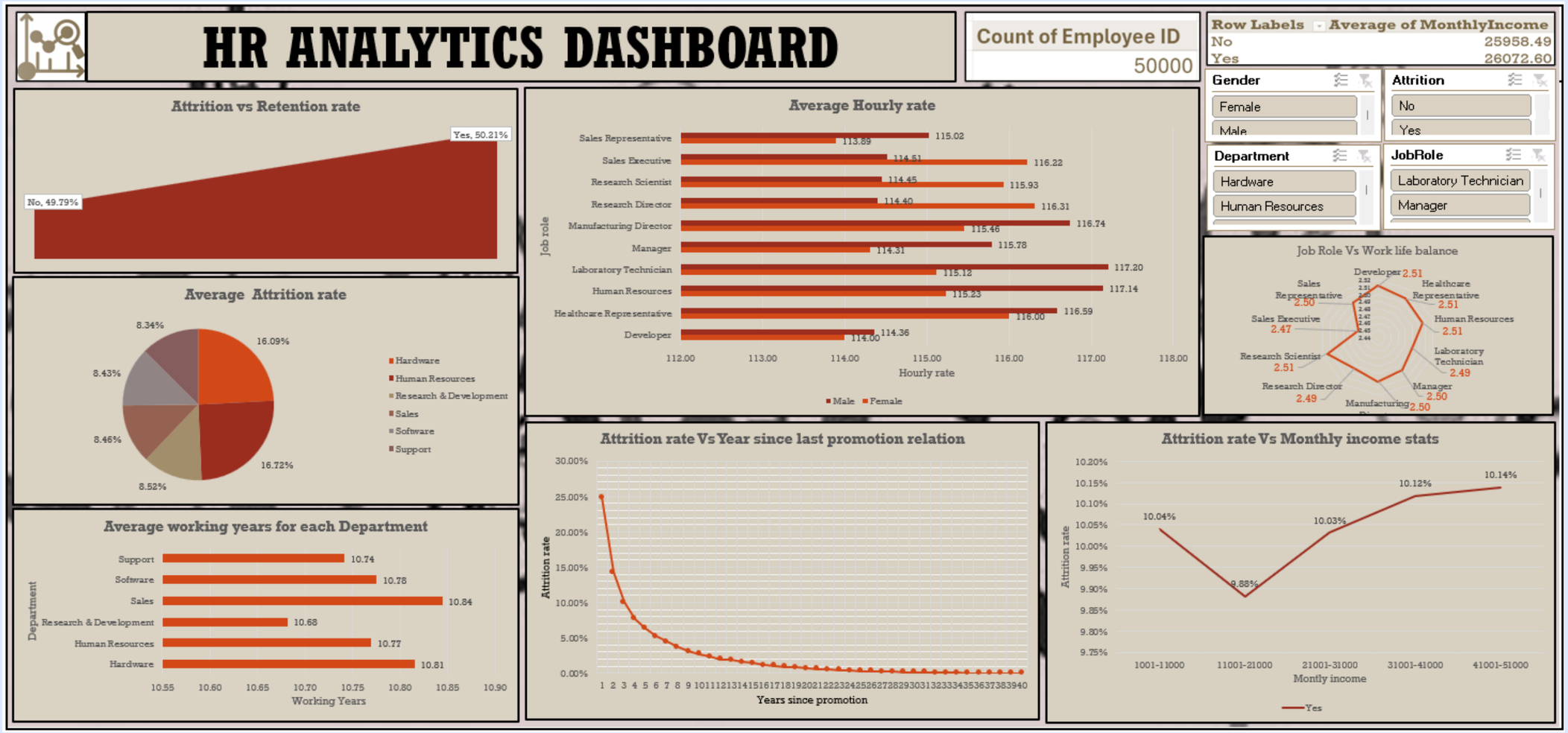
KPI 6

Attrition rate Vs Year since last promotion relation

INFERENCE: The KPI 6 shows a strong correlation between years since last promotion and attrition rates. Employees who have not been promoted in 1-5 years have a significantly higher attrition rate (63.27%) compared to those who have been promoted more recently. This suggests that lack of career progression is a major factor contributing to employee turnover. As the time since last promotion increases, the attrition rate decreases, indicating that employees who have been promoted more recently are more likely to stay with the company.

EXCEL DASHBOARD

We utilized pivot tables to filter data and perform mathematical operations on the dataset. For the dashboard, we incorporated slicers and cards along with data visualizers like bar charts and pie charts to enhance the presentation and interactivity.

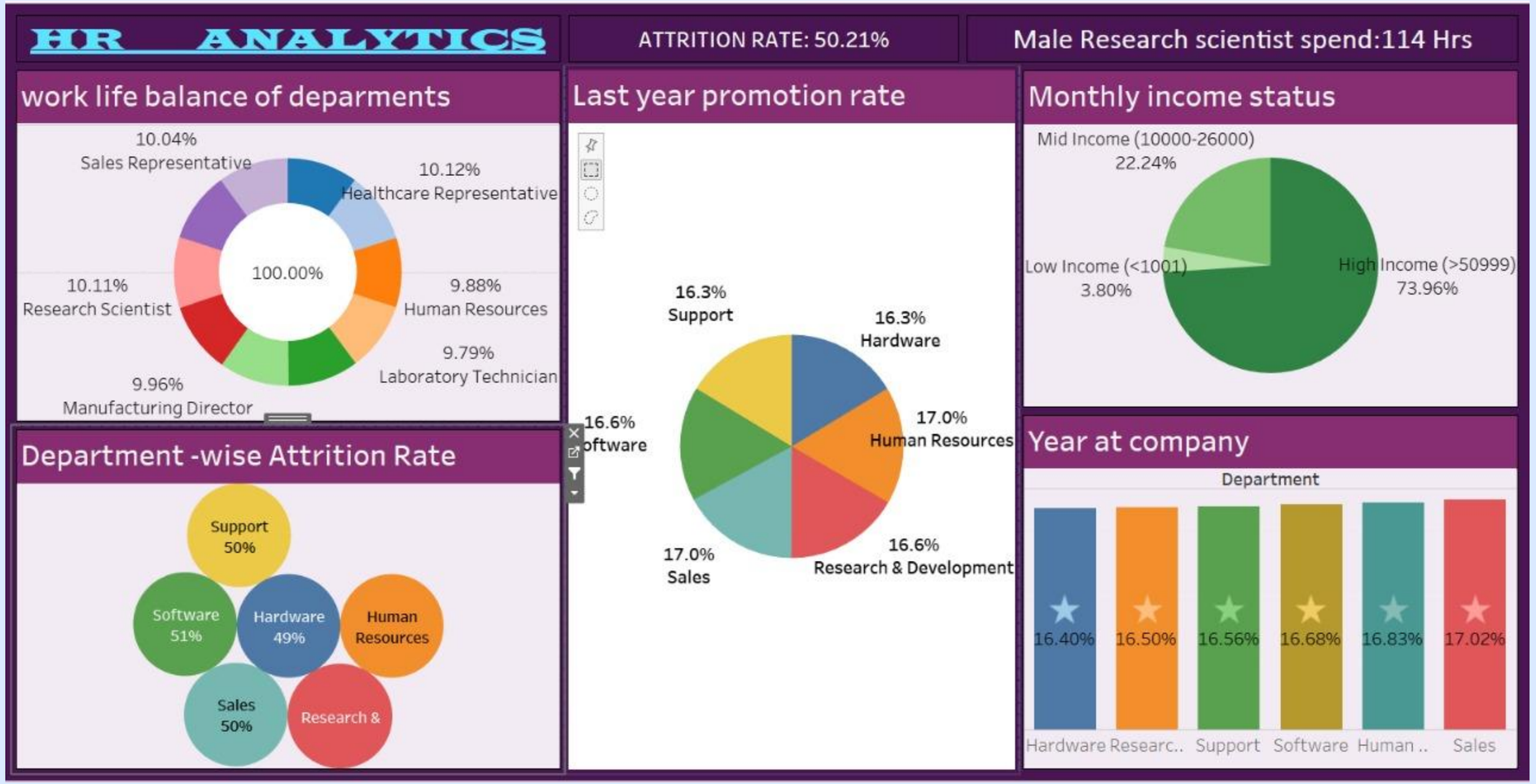


POWER BI DASHBOARD

We connected SQL Server to Power BI Desktop, enabling data visualization and analysis. Additionally, we used DAX formulas where necessary to enhance the insights and functionality of the visualizations.

TABLEAU DASHBOARD

We connected SQL Server to Tableau, enabling direct data import for creating interactive visualizations. This integration enhances data analysis and interpretation through dynamic visual tools.



MYSQL QUERIES

Initially, we created a database in MySQL and used it to set up a table. The table's structure must align with the format of the excel file. When defining column names, we also need to specify the data type for each column, such as VARCHAR for text or INT for integers. Once the table with the required columns is created, we can import the CSV file into MySQL using the wizard option provided in MySQL Workbench. This process ensures that the data is correctly mapped and inserted into the table.

Table structure

```
-- Dumping structure for table assignment.hr_1
CREATE TABLE IF NOT EXISTS `hr_1` (
  `Age` int(2) DEFAULT NULL,
  `Attrition` varchar(3) DEFAULT NULL,
  `BusinessTravel` varchar(17) DEFAULT NULL,
  `DailyRate` int(4) DEFAULT NULL,
  `Department` varchar(22) DEFAULT NULL,
  `DistanceFromHome` int(2) DEFAULT NULL,
  `Education` int(1) DEFAULT NULL,
  `EducationField` varchar(16) DEFAULT NULL,
  `EmployeeCount` int(1) DEFAULT NULL,
  `EmployeeNumber` int(5) DEFAULT NULL,
  `EnvironmentSatisfaction` int(1) DEFAULT NULL,
  `Gender` varchar(6) DEFAULT NULL,
  `HourlyRate` int(3) DEFAULT NULL,
  `JobInvolvement` int(1) DEFAULT NULL,
  `JobLevel` int(1) DEFAULT NULL,
  `JobRole` varchar(25) DEFAULT NULL,
  `JobSatisfaction` int(1) DEFAULT NULL,
  `MaritalStatus` varchar(8) DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8 COLLATE=utf8_general_ci;
```

```
#Q1
SELECT hr_1.Department AS Departments,AVG(CASE WHEN hr_1.Attrition = 'Yes' THEN 1 ELSE 0 END) AS Attrition_Rate
FROM hr_1
GROUP BY hr_1.Department;
```

KPI 1

```
SELECT concat(round(AVG(hr1.HourlyRate),0)," hours") AS Avg_Hourly_Rate
FROM hr_1 AS hr1
JOIN hr_2 AS hr2 ON hr1.EmployeeNumber = hr2.`Employee ID`
WHERE hr1.JobRole = 'Research Scientist' AND hr1.Gender = 'Male';
```

KPI 2

```
SELECT
    AVG(CASE WHEN hr1.Attrition = 'Yes' THEN 1 ELSE 0 END) AS Attrition_Rate,
    AVG(hr2.MonthlyIncome) AS Avg_Monthly_Income
FROM
    hr_1 AS hr1
JOIN
    hr_2 AS hr2
ON
    hr1.EmployeeNumber = hr2.EmployeeID
GROUP BY
    hr1.Attrition
```

KPI 3

MYSQL QUERIES

```sql
SELECT
    hr1.Department,
    AVG(hr2.TotalWorkingYears) AS Avg_Working_Years
FROM
    hr_1 AS hr1
JOIN
    hr_2 AS hr2 ON hr1.EmployeeNumber = hr2.EmployeeID
GROUP BY
    hr1.Department;
```

KPI 4

```sql
SELECT
    hr1.JobRole,
    AVG(hr2.WorkLifeBalance) AS Avg_Work_Life_Balance
FROM
    hr_1 AS hr1
JOIN
    hr_2 AS hr2 ON hr1.EmployeeNumber = hr2.EmployeeID
GROUP BY
    hr1.JobRole;
```

KPI 5

```sql
SELECT
    AVG(CASE WHEN hr1.Attrition = 'Yes' THEN 1 ELSE 0 END) AS Attrition_Rate,
    AVG(hr2.YearsSinceLastPromotion) AS Avg_Years_Since_Last_Promotion
FROM
    hr_1 AS hr1
JOIN
    hr_2 AS hr2 ON hr1.EmployeeNumber = hr2.EmployeeID
GROUP BY
    hr1.Attrition;
```

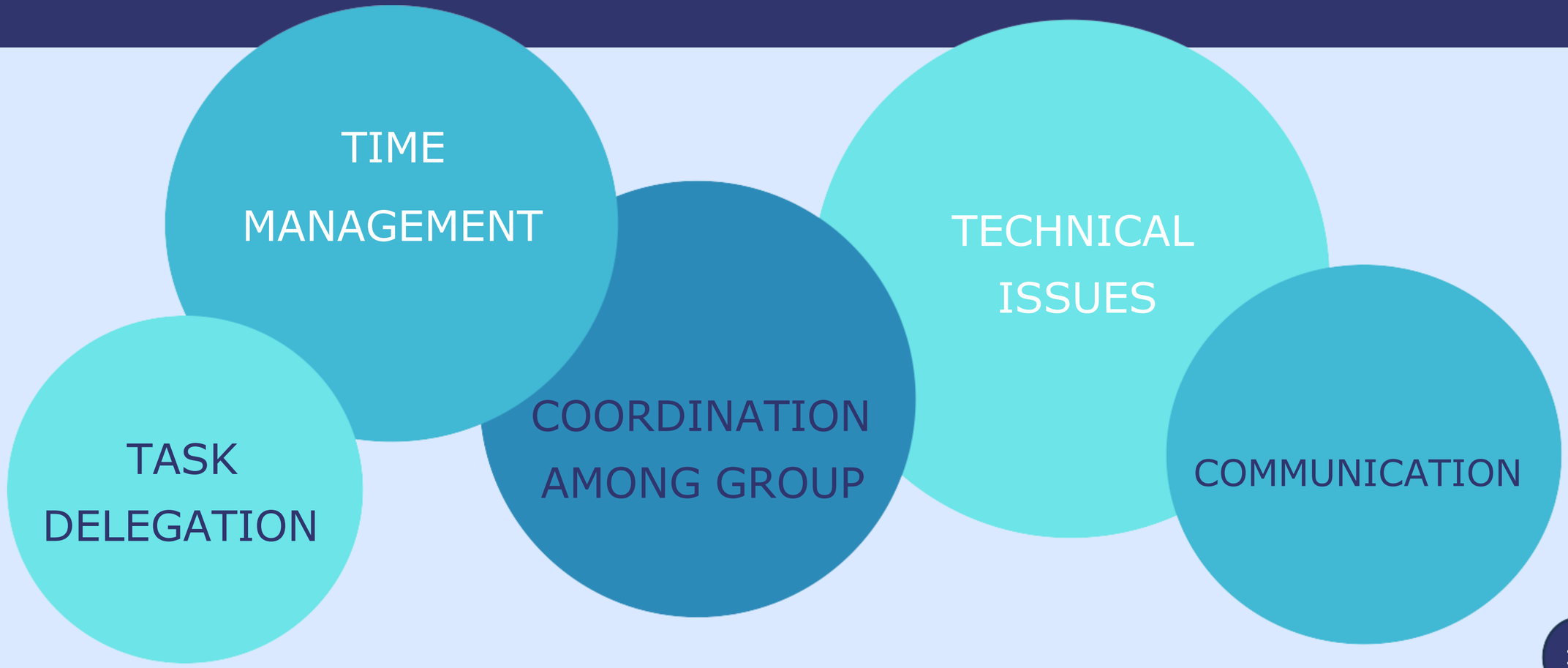
KPI 6

CONCLUSION/INFERENCES

- High Attrition in Hardware & HR: Focus on improving job satisfaction and engagement in these departments to reduce turnover.
- Address Pay Disparities: Analyze and resolve gender-based pay gaps to ensure equity and fairness.
- Career Development Matters: High attrition among employees not promoted in 1-5 years highlights the need for clear career progression and timely promotions.
- Work-Life Balance Strength: Maintain and enhance existing policies to further boost employee morale.
- Retention by Income: Employees in the $31,001–$41,000 range show higher retention, indicating satisfaction in this bracket.

The company faces retention challenges, particularly in the Hardware and HR departments, and among employees with delayed promotions. Addressing pay equity, enhancing career growth opportunities, and leveraging strong work-life balance policies can significantly improve employee retention and satisfaction.

CHALLENGES FACED DURING PROJECT



THANK YOU