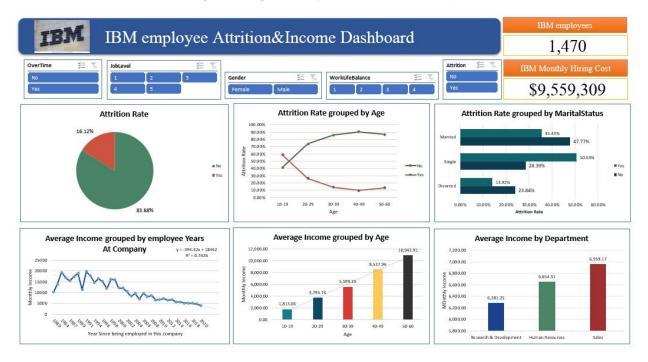**IBM HR Analytics Employee Attrition & Performance**

The IBM Employee data set is a collection of features that describe employee information and the satisfaction of employees received from work.

The problem that the company faces are:

1. *Which employees are likely to leave the company?*
2. *Are employees in the company receiving an appropriate wage?*

Therefore, data analysis plays a role in knowing the impact of problems and how to solve them. With the steps to do as follows:

1. **Investigating data** to understand the definition of features, check NULL values and type of features.
2. **Data Manipulation / Feature Selection [dataset worksheet]** by adding/deleting the less important or unexplainable features.
3. **Exploratory data analysis (EDA)** by doing a pivot table and pivot chart to find interesting study issues.
4. **Create Dashboard to explain the problem [dashboard worksheet]**

The finding for those problem are:

- There are many factors that significantly affect the decision to leave the company. (Overtime, Joblevel, Gender, WorkLifeBalance, Age, MaritalStatus and etc.)
- The resignation of employees has a big negative effect on the company because the resignation of employees will cause the company to lose the cost of hiring the employees. It was found that 237 out of 1,470 employees resigned and caused the company to pay $ 1,134,541 per month or 11.86 percent of the hiring cost of per month.

- The company hires highly skilled employees (JobLevel = 5) with high salaries. Especially in the Research and Development department.
- The company has employment at an appropriate salary level. Which can be explained by the Average Income grouped by employee YearsAtCompany graph. The average employee's income will increase when they have more experiences, which is reasonable and explains the company's career path.

5. **Inferential Statistic & Modeling (Logistic Regression) [IBM_Inferntial_Statistic.ipynb]** In order to predict the results of the staff leaving the company To see what factors are causing the chance that employees will leave the company.

6. **Conclusions & Recommendations**

The conclusions for this model are shown as list:

1. These are the factors that causing employees to make a decision to leave this company or not. (Except MaritalStatus_Married and EducationField_Other)

```
Intercept                         8.823034
Age                               0.976229
DistanceFromHome                  1.037009
EnvironmentSatisfaction           0.675000
JobInvolvement                    0.578948
JobSatisfaction                   0.667561
RelationshipSatisfaction          0.807516
TotalWorkingYears                 0.944617
WorkLifeBalance                   0.737704
YearsInCurrentRole                0.887232
YearsSinceLastPromotion           1.203492
YearsWithCurrManager              0.908103
BusinessTravel_Travel_Frequently  5.834935
BusinessTravel_Travel_Rarely      2.610072
EducationField_Marketing          1.556294
EducationField_Medical            0.696065
EducationField_Other              0.744269
Gender_Male                       1.512644
MaritalStatus_Married             1.310167
MaritalStatus_Single              3.635488
OverTime_Yes                      5.853293
dtype: float64
```

2. The most effective factor that makes employees decide to leave this company is overtime (If employees work overtime, they tend to leave this company about 585% compared to employees who do not work overtime) and the second one is the frequent of the employees traveling.
3. The least effective factor is JobInvolvement (~57% if they have less job responsibility).

To avoid employee attrition problem, the company needs to:

1. The company should take good care of employees and should not let them work more than necessary and checking the reasons of employees who travel frequently.
2. The company must make the environment better, especially Work-Life Balance (WorkLifeBalance 73.7%) and Team working environment (RelationshipSatisfaction 80.7%).