**Credit Card Default Risk Analysis Report**

**1. Introduction**

Credit card default is a critical issue for financial institutions, as it affects profitability and risk management. This project aims to analyze credit card customer data to identify key risk factors contributing to defaults. The insights derived will help in improving credit risk assessment and decision-making for financial institutions.

**2. Objectives**

The primary objectives of this project are:

* To analyze the default rate among credit card customers based on various demographic and financial factors.
* To identify the impact of education, age, marital status, and credit utilization on default probability.
* To visualize the distribution of defaulters and non-defaulters.
* To create interactive dashboards for effective decision-making.
* To implement a what-if analysis to simulate different risk scenarios.

**3. Data Overview**

* The dataset consists of 30,000 credit card customers with the following key attributes:
* Demographics: Age, Sex, Marital Status, and Education.
* Financial Information: Credit Limit, Bill Amounts (last six months), and Payment Status.
* Behavioural Indicators: Payment History and Credit Utilization.
* Target Variable: Default Status (Defaulter or Non-Defaulter).

**4. Data Pre-processing & Transformation**

* Removed missing or inconsistent values.
* Transformed categorical variables like Education, Marital Status, and Payment Status for better visualization.
* Created calculated columns such as Credit Utilization % and Default Rate %.
* Grouped Age into categories (e.g., 18-25, 26-35, etc.) for better analysis.

**5. Dashboard & Visualizations**

The Power BI dashboard includes multiple interactive visuals:

* Total Customers & Default Rate: KPI cards displaying total customers (30,000), defaulters (6,636), and the default rate (22.12%).
* Default Rate by Education Level: A bar chart illustrating the distribution of defaults across different education levels.
* Default vs. Non-Default Customers: A pie chart showing the percentage split of defaulters and non-defaulters.
* Credit Utilization %: A gauge chart indicating the average credit utilization of customers.
* Payment Delay Impact: A table showing default payment probabilities based on past payment history.

Additional Insights through Visualizations:

* Default Rate by Age Group: Identifies which age group is most prone to defaults.
* Credit Utilization vs. Default Rate: Explores the correlation between credit utilization and risk.
* Monthly Bill Amount Trend: Helps in understanding bill payment patterns.

**6. Key Findings & Insights**

* Customers with higher credit utilization rates tend to have a higher default risk.
* University graduates have the highest number of defaulters compared to other education levels.
* Younger customers (18-35 years old) show higher default rates compared to older age groups.
* Customers with past payment delays (PAY\_0 > 2) are significantly more likely to default.
* Male customers have a slightly higher default rate compared to female customers.

**7. Recommendations**

Based on the analysis, the following actions are recommended:

* Implement stricter credit utilization limits for high-risk customers.
* Introduce financial literacy programs for younger customers to improve credit management.
* Adjust credit approval policies based on educational background and past payment behavior.

**8. Conclusion**

This Power BI project provides a comprehensive analysis of credit card default risk factors using interactive visualizations. By leveraging these insights, financial institutions can enhance their risk assessment models, improve credit policies, and reduce default rates. The dashboard serves as a valuable tool for monitoring credit risk trends and making data-driven decisions.