📄 Project Scope Document

Project Title: Dynamic Credit Utilization Forecasting – Predictive & Prescriptive Segmentation
Project Owner: Group 3 , PGDM Batch 2024–2026

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1. Project Objective

The goal of this project is to build a **data-driven system** that helps credit card issuers make smarter decisions about customer credit limits and interest rates.

We will use customer financial behavior (spending, payments, balances) and demographic information (age, income, education, region, etc.) to:

- **Segment customers** into meaningful groups.
- **Forecast future credit utilization** under different stress conditions (e.g., economic downturn, interest rate hikes).
- **Recommend personalized credit strategies**, including dynamic credit limit adjustments and APR (interest rate) recommendations.

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2. Project Scope

🔹 In Scope (What the project will cover)

1. **Data Preparation & Integration**
   - Merge **financial dataset (CC General)** and **demographic dataset** using `CUST_ID`.
   - Clean missing values, handle outliers, normalize ratios.
2. **Feature Engineering**
   - Create important behavioral ratios:
     - *Utilization Ratio = Balance / Credit Limit*
     - *Repayment Discipline = Full Payment % + Payments vs Minimums*
     - *Cash Advance Dependency = Cash Advance / Purchases*
3. **Segmentation (Descriptive Analysis)**
   - Group customers into segments such as:
     - *Safe High Spenders*
     - *Moderate Users*
     - *Revolvers (carry balance)*
     - *Over-Leveraged Customers*
   - Profile segments with **demographics** (e.g., young professionals in metro cities vs retirees in semi-urban areas).
4. **Predictive Modeling**
   - Build machine learning models to **forecast credit utilization**.
   - Simulate stress scenarios like recession (lower repayments) or interest rate hikes (higher balances).
5. **Prescriptive Strategy (Recommendations)**
   - Develop rules for **dynamic credit limit management**:
     - Upgrade safe users with higher limits.
     - Monitor or restrict risky users.
   - Propose **personalized APR (interest rates)** based on customer risk and value.

🔹 **Out of Scope (What the project will not cover)**

- Real-time fraud detection (covered in a different use case).
- Integration with live bank systems.
- Customer churn/attrition prediction.

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3. Deliverables

- **Data Dictionary & Preprocessed Dataset** – Clear documentation of all financial and demographic variables.
- **Customer Segmentation Report** – Cluster profiles with insights on behaviors and demographics.
- **Forecasting Model Output** – Predicted utilization patterns under normal and stress conditions.
- **Prescriptive Recommendation Matrix** – Credit limit and APR adjustment guidelines for each segment.
- **Presentation/Dashboard (Optional)** – Visual storytelling of findings for stakeholders.

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4. Business Impact (KPIs)

- 📈 **Revenue Optimization** → Increase in card usage from safe customers after targeted limit upgrades.
- 💳 **Risk Reduction** → Decrease in defaults or over-leveraging.
- 🎯 **Customer Satisfaction** → Improved trust and loyalty through personalized strategies.
- ⚡ **Operational Efficiency** → Data-driven decision-making instead of static rules.

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5. End Goal

At the end of this project, we will deliver a **predictive and prescriptive credit management framework** that helps banks and credit card issuers:

1. Trust the right customers with more credit.
2. Proactively detect and control risky credit usage.
3. Replace static, one-size-fits-all lending rules with **predictive and prescriptive strategies** grounded in customer data.

In simple terms:
This project will show banks how to give more credit to customers who deserve it, avoid risky defaults, and make personalized strategies that improve both profits and customer loyalty.