

Use Case 3: Credit Risk Analysis

TEAM: 07

Introduction

“In today’s digital-first world, financial institutions face the challenge of processing thousands of loans and credit card applications daily. Manual reviews are slow, inconsistent, and often inaccurate, leading to higher turnaround times, customer frustration, and rising default rates. There is an urgent need for a smarter, automated, and reliable risk assessment system.”

Problem Statement

- Manual credit risk evaluation is **time-consuming and error-prone**
- Outdated scoring models fail to capture **true risk factors**
- High default rates → impacts **financial health of institutions**
- Customers often face **delays or unfair rejections**

Our Solution

We built an AI powered *CréditVue* that transforms the loan approval process into a **fast, transparent, and data-driven experience**.

Key Interactions

1. **Login & Secure Access** – Role-based authentication ensures only authorized users can access data.
2. **Upload Dataset** – User uploads loan/credit application data (CSV/Excel).
3. **Dashboard Overview** –
 - Total number of entities in the dataset
 - Risk distribution (**High / Medium / Low**) with RAG color coding
 - Pie chart showing percentage of each risk level
 - **Top 5 risky customers** highlighted instantly
4. **Risk-Specific Pages** – Clicking on **High / Medium / Low risk cards** redirects to detailed pages showing:
 - Customers in that category

- Top “X” risky customers with priority ranking
- 5. **Customer Portfolio** – Selecting any customer opens their **detailed credit profile**, including:
 - Financial history & parameters
 - Risk score explanation
 - Recommendation on whether to approve or deny credit

Why It Works

- **Simplicity:** Straightforward workflow — upload → analyze → view risks → drill down to customer portfolio.
- **Transparency:** Every decision backed by financial parameters and explainable ML models.
- **Scalability:** Designed as **microservices architecture**, meaning components (auth, ML model, dashboard, APIs) work independently and can scale easily.
- **Business Impact:** Saves time, reduces default rates, and improves customer experience.

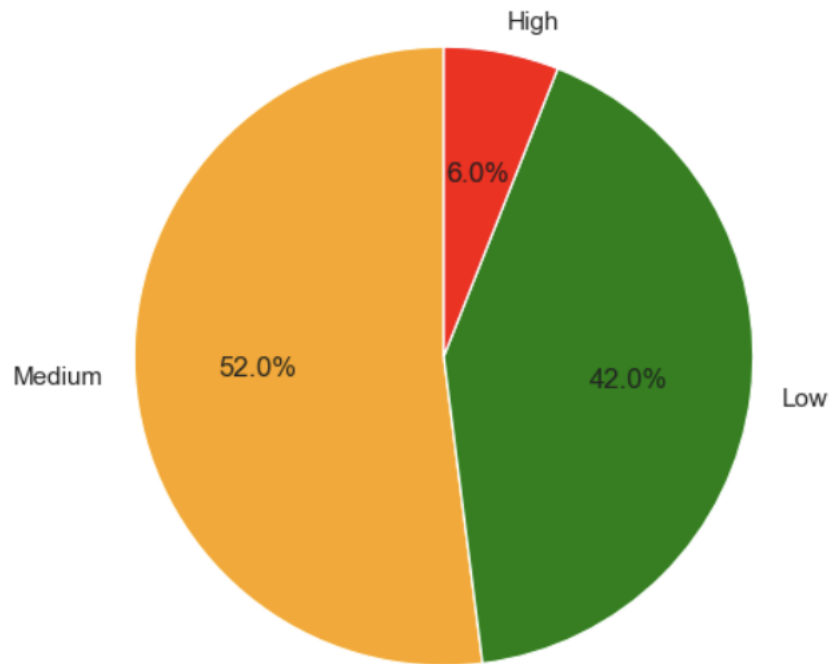
Effectiveness of Our Solution

- **Faster Decisions:** Reduced turnaround time from days to minutes with automated risk evaluation.
- **Higher Accuracy:** ML-powered scoring captures true risk factors better than manual or legacy models.
- **Actionable Insights:** Clear dashboard with RAG (Red/Amber/Green) status and top risky customers for quick prioritization.
- **Scalability:** Microservices architecture handles thousands of applications seamlessly.
- **Smarter Risk Management:** Early detection of high-risk customers that leads to reduced default rates and stronger portfolio quality.
- **Better Customer Experience:** Faster approvals for low-risk customers improves satisfaction and retention.

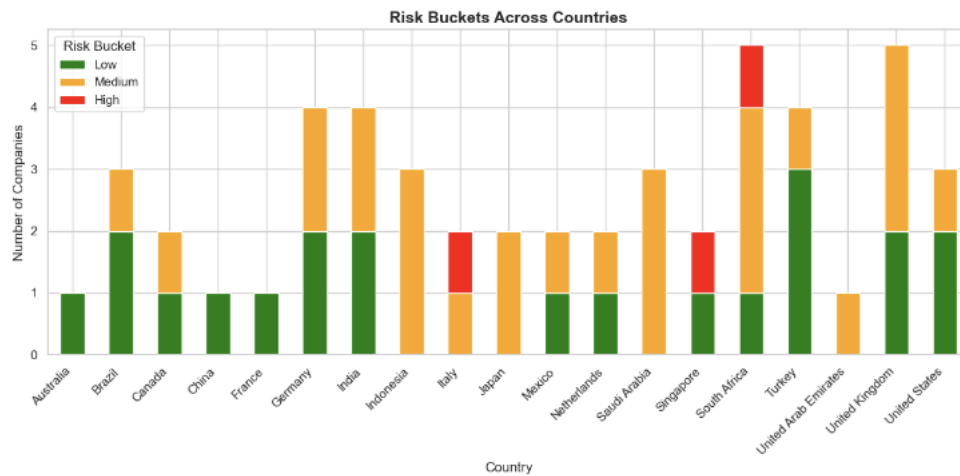
Data Visualization

1. Pie Chart

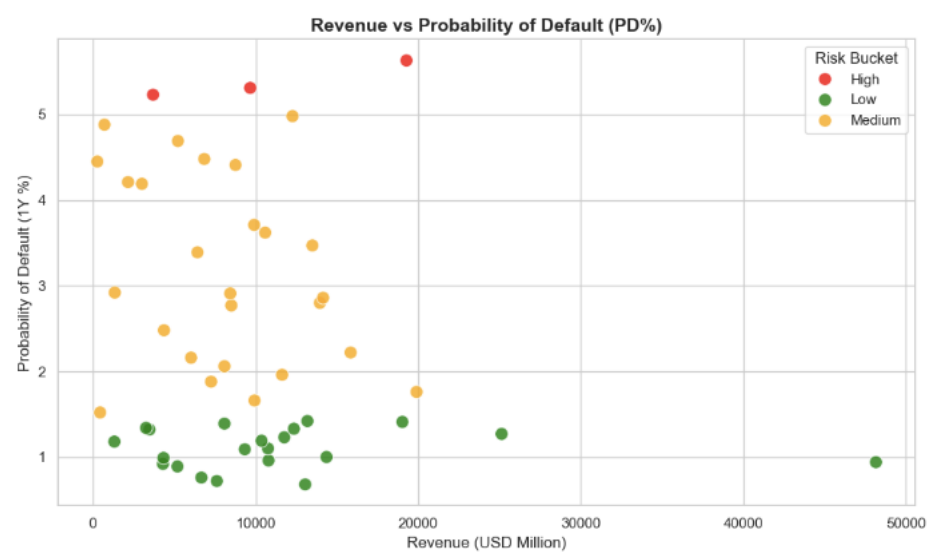
Distribution of Companies by Risk Bucket



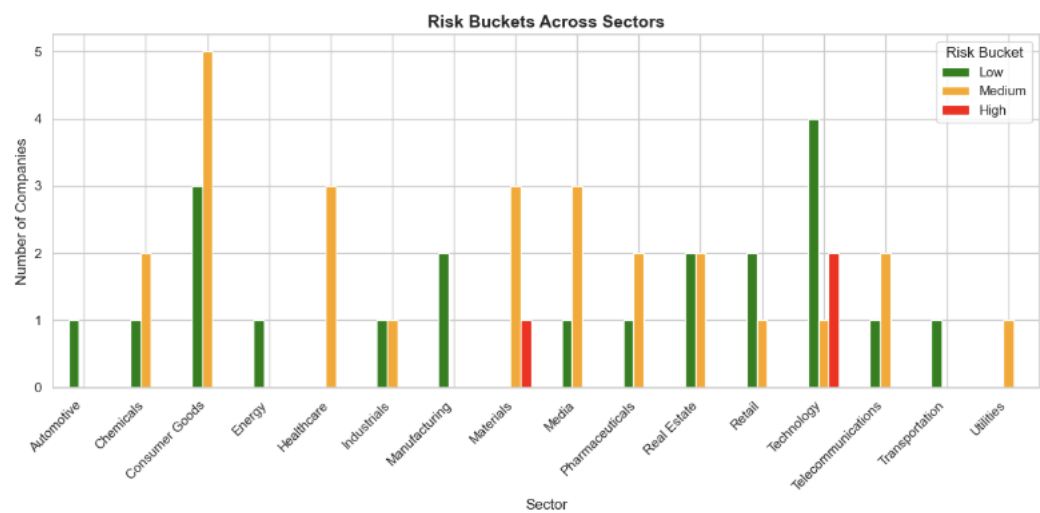
2. Stacked Plot



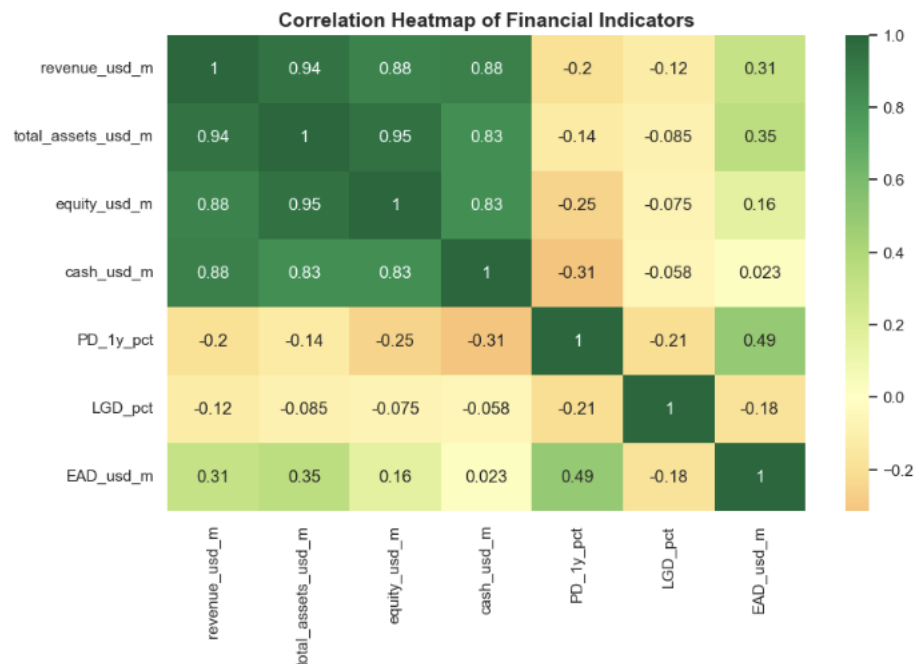
3. Scatter Plot



4. Clustered Bar Plot



5. Correlation Heatmap



Tech Stacks

- Frontend: React + TypeScript
- Backend: Node JS, Express JS
- ML Frameworks: Random Forest
- Database: MongoDB
- Authentication: Firebase

Conclusion

The ***CréditVue*** transforms credit evaluation into a **faster, smarter, and transparent process**. With ML-driven scoring, real-time dashboards, and scalable microservices, it empowers institutions to **reduce defaults, speed up approvals, and build customer trust**.

In short: **Smarter Decisions. Faster Approvals. Stronger Portfolios.**