

Amartha X GDG Jakarta Hackathon Project Proposal

Team Name: Job Hunter Team

Project Title: Amara - AI Credit score

1. Problem Statement

Access to fair and accurate credit scoring is a major challenge for micro-entrepreneurs in rural Indonesia, especially women who run informal, cash-based businesses. Traditional credit scoring relies on formal documents—bank statements, collateral, and credit history—which most Amarta borrowers do not have. Their income is unrecorded, inconsistent, and difficult to verify.

This leads to several problems: limited and incomplete data, subjective field assessments, income misreporting due to low financial literacy, and a higher risk of default from mismatched loan allocation. These challenges affect Amarta's portfolio quality, borrower growth, and the broader mission of financial inclusion. Traditional methods cannot scale or capture the real socioeconomic context of borrowers.

With access to multimodal data—tabular customer records, loan snapshots, repayment history, business and house photos, and field agent notes—there is a strong opportunity to apply Generative AI. By using multimodal intelligence to analyze text, images, and numeric data together, Amarta can create a more adaptive, fair, explainable, and data-rich credit scoring system that improves decision-making at scale.

2. Proposed Solution/Concept

We propose Amara AI, an adaptive, multimodal credit scoring and income validation engine powered by Google Gemini and machine learning. The system integrates tabular loan data, business and house photos, and field-agent narratives to produce a more accurate and context-aware assessment of borrower creditworthiness.

Core Concept

Amara AI fuses three data modalities:

1. **Tabular ML Risk Model:** Leveraging repayment patterns, loan behavior, and borrower demographics to predict baseline credit risk.
2. **Generative AI Vision Insights:** Gemini Vision analyzes business and house photos to estimate inventory density, business type, physical scale, asset ownership, and socioeconomic indicators.
3. **LLM-Based Text Insight Extraction:** Gemini NLP reads field-agent reports to extract income claims, sentiment, risk cues, and behavioral consistency.

Key Features

- **Adaptive Credit Scoring Engine:** Combines ML prediction with AI-generated insights to produce a dynamic, context-aware score.
- **Income Reality Check:** Compares claimed income with AI-estimated income to highlight inconsistencies.
- **Visual Socioeconomic Indicators:** Uses photos to infer living conditions, business robustness, and financial stability.
- **Risk Explanation Layer:** Gemini generates human-readable explanations to support transparent decision-making.
- **Loan Recommendation Engine:** Suggests optimal loan amounts, risk levels, and justification based on borrower context.

Uniqueness

Unlike traditional scoring models, Amara AI leverages multimodal Generative AI to “see, read, and understand” borrower conditions beyond numbers. This combination yields deeper insights, eliminates subjectivity, and gives Amartha a scalable, fair, and future-ready scoring ecosystem.

3. Target Users

The main users of our solution are **Amartha's field agents, credit risk analysts, and women micro-entrepreneurs** in rural areas of Indonesia. Most borrowers run small, informal businesses such as small shops, food stalls, sewing services, or home industries. Their monthly income is usually around Rp1–5 million, and most transactions are done in cash. Because they do not have formal financial documents, it is difficult for them to get a fair and accurate credit evaluation.

Example: ‘Ibu Ratna, 38, runs a home-based snack business, making fried snacks and selling them to neighbors. She earns money daily but has no record book and can't explain her exact monthly income. She wants a small loan to buy a new cooking pan and increase production.’

Amara AI helps borrowers like them get a fairer credit assessment while giving field agents and credit analysts more clear, consistent, and objective insights. This helps Amartha reduce risk, improve loan quality, and support more women-led microbusinesses.

4. High-Level Implementation Strategy

Technical Approach

- **Machine Learning (Python, Scikit-learn)** for data preprocessing and modeling.
- **Google Gemini** for multimodal reasoning (image + text + numeric).
- **Gemini Vision API** to extract business insights.
- **Gemini NLP** for understanding field agents notes.
- **React / Next.js** for a dashboard.
- **Postgresql Supabase** for database

Architecture Overview

- Data input: features data + photos + field agents report.
- ML model predicts baseline credit score and risk.
- Gemini Vision generates visual features (business scale, inventory, house condition).
- Gemini NLP extracts behavioral and insight.
- System outputs: final creditworthiness score, income consistency score, risk flags, and recommended loan amount.
- Dashboard displays results with explainability generated by Gemini.

This architecture ensures that all AI components work together seamlessly, enabling fast, explainable, and scalable credit scoring

Key Steps

- Prepare and clean tabular data, then build the baseline ML credit risk model.
- Use Gemini Vision and Gemini NLP to extract insights from photos and field agents notes.
- Fuse tabular, visual, and text features inside the Adaptive Scoring Engine.
- Build backend services and connect all data flows to PostgreSQL (Supabase).
- Develop a simple React/Next.js dashboard to display scoring results with explanations.
- Integrate, test end-to-end, refine scoring logic, and prepare demo data for the MVP presentation.

5. Team Members & Roles

- **Luctfy Alkatiri Moehtar - Project Lead**
Responsible for coordinating the project, ensuring milestone alignment, and helping data scientist for handling model architecture
- **Farissthira S. - Data Engineer**
Responsible for ETL pipeline, data preprocessing, and preparing clean dataset for modeling
- **Gede Davon Ananda P. - Data Scientist**
Responsible for developing ML Models, perform model experiments,, model evaluation, and collaborates on multimodal fusion
- **Abu Ammar - Full Stack Developer**
Developing an app and builds the frontend using next.js and backend supabase, database and cloud infrastructure
- **Rajib Kurniawan - Business Strategist**
Conduct business requirement analysis, prepares presentation materials, and ensures the solution aligns with Amartha's operational goals