

## # Finsage Project Approach & Architecture

### ## Project Title

**\*\*Finsage\*\*** A Modern AI-Powered Personal Finance Assistant

### ## Objective

To develop a privacy-first, AI-enhanced web application that empowers users to track income, expenses, and financial trends through a modern UI, intelligent automation (OCR + LLMs), and data visualization.

### ## Technology Stack

Frontend: Next.js (App Router), TypeScript, Tailwind CSS, shadcn/ui, Recharts

Backend: Next.js Route Handlers, Firebase Functions, Google APIs

Database: Firebase Firestore

Authentication: Firebase Auth

AI / OCR: Google Cloud Vision, Gemini API (Generative AI Studio)

Deployment: Netlify

### ## System Architecture Overview

Mermaid Diagram included in README.

### ## Functional Requirements

- Authentication via Firebase (email/password)
- Manual or intelligent transaction entry (via OCR)
- Bank statement bulk classification (Gemini API)
- Dynamic dashboard and statistics visualizations

- AI-based insights using financial summaries
- Secure access and user-based scoping

## ## Intelligent Automation Components

- OCR via Google Cloud Vision
- Entity extraction (amount/category) using Gemini
- Monthly financial insight generation using Gemini
- Table-based transaction classification via Gemini

## ## APIs Developed

- POST `/api/amount-extract`
- POST `/api/file-transaction`
- GET `/api/stats/summary`
- GET `/api/stats/insights`

## ## Data Models (Firestore)

- `users/{uid}`
- `income/{doc}`: `uid`, `amount`, `source`, `date`, `createdAt`
- `expenses/{doc}`: `uid`, `amount`, `category`, `date`, `createdAt`

## ## Solution Highlights

Manual + OCR/AI data input

Realtime filtering + smart insights

Clean UI with shadcn/ui

Firebase Auth + scoped Firestore rules

## ## Security Notes

- Firestore rules scoped to authenticated `uid`
- Google credentials are server-only and .gitignored
- Prompt engineering guards LLM misuse

## ## Future Enhancements

- Recurring transaction detection
- PDF exports
- Multi-wallet support
- PWA support
- Notification support

## ## Demo Credentials

- URL: <https://finsage.vercel.app>
- Email: test@gmail.com
- Password: 123456

## ## Demo Video

YouTube: <https://youtube.com/your-demo-link>