# SafebiteAI Capstone Project Proposal

## Project Title

SafebiteAI: AI Food & Drink Safety & Allergy Risk Scanner

## Presenter

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## Executive Summary

SafebiteAI is an AI-powered mobile and backend platform that allows users to instantly assess the safety of food and drink products. Using Vertex AI models, the system detects allergens, harmful additives, and potential contamination risks from product images and ingredient lists.

SafebiteAI is fast, scalable, and mobile-first, making it suitable for everyday consumers, health-conscious individuals, and commercial applications.

## Problem Statement

Consumers frequently face uncertainty when purchasing packaged foods and drinks, specifically regarding:
- Hidden allergens
- Harmful additives
- Contamination or expired products

Current solutions are manual, slow, or incomplete, creating a clear need for a reliable, AI-powered verification tool.

## Project Objectives

Enable instant scanning and analysis of food and drink products.
Detect allergens, harmful additives, and contamination risks using Vertex AI.
Provide clear, actionable safety recommendations to users.
Build a scalable backend and mobile-first frontend.

## Target Users

Health-conscious consumers and individuals with allergies.
Restaurants, cafes, and retailers monitoring product safety.
Parents and caregivers ensuring safe food and drinks.

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## Project Architecture

SafebiteAI/
├── backend/ # Node.js + Express + Vertex AI integration
├── frontend/ # Flutter mobile app
├── docs/ # Proposal + Slides PDFs
├── media/ # Demo video + screenshots

Backend: Handles image processing, AI analysis, and API endpoints.
Frontend: Mobile app for scanning and instant feedback.
AI Integration: Vertex AI (Gemini models) for risk scoring and analysis across allergens, additives, and contaminants.

## Key Features

Scan food and drinks using images.
Brand and ingredient recognition.
AI-powered allergy and contamination risk detection.
Real-time feedback and safety scoring.
Scalable cloud-based backend.
User-friendly mobile interface.

## Expected Impact

Reduce allergic reactions and health risks from unsafe products.
Empower consumers with trustworthy, instant food and drink analysis.
Assist restaurants, cafes, and retailers in monitoring product safety.

## Sustainability & Scalability

Modular AI components allow for future updates and expansion.
The cloud backend ensures high availability and scaling.
Mobile-first design guarantees accessibility and adoption.

## Deliverables

Fully functional Flutter mobile app.
Node.js backend with Vertex AI integration.
Project documentation: Proposal PDF, Slides PDF, Demo video.
Screenshots showing product scanning and results.

## References

Google Vertex AI documentation
Food safety and allergen databases

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Best practices for mobile AI solutions