PROJECT REPORT : FLAVOR FUSION AI DRIVEN RECIPE BLOGGING

TEAM-ID-LTVIP2026TMIDS91040

1. INTRODUCTION

1.1 Project Overview

Flavour Fusion is an AI-powered web application that automates the creation of professional-quality recipe blog posts. Users simply enter a recipe topic (e.g., "Vegan Chocolate Cake" or "Quick Chicken Biryani") and select a target word count. The application uses Google's Gemini AI model to generate structured, engaging content including title, introduction, ingredients, step-by-step instructions, tips, serving suggestions, and storage information.

The app provides a clean, dark-themed Streamlit interface with loading feedback (random cooking jokes) for better user experience. It is deployed on Streamlit Community Cloud for free public access.

1.2 Purpose

The main purpose is to help food bloggers, home cooks, content creators, and beginners generate high-quality, SEO-friendly recipe content in seconds instead of hours of manual writing. It solves the problem of time-consuming content creation while maintaining creativity, structure, and professionalism using generative AI.

1.3 Objectives

- Develop a user-friendly web interface for recipe topic input and word count selection.
- Integrate Google Gemini API to generate structured JSON-based recipe blog posts.
- Display formatted output with sections like ingredients, instructions, tips, etc.
- Ensure real-time generation with loading indicators and error handling.
- Deploy the application publicly and make it easy to update/maintain.

2. IDEATION PHASE

2.1 Problem Statement

Food bloggers and content creators spend significant time researching, writing, and formatting recipes. Existing recipe apps provide static databases but lack on-demand, customized, long-form blog-style content generation. Manual writing is time-intensive and may lack inspiration for unique variations.

2.2 Empathy Map Canvas

- **Says**: "I need new recipe ideas quickly", "Writing full blogs takes too long", "I want professional-looking content".
- **Thinks**: "How can I make unique recipes without copying?", "Will AI make it sound natural?".
- **Does**: Searches Google for recipes, copies/pastes, rewrites manually.
- **Feels**: Frustrated with repetition, worried about originality, excited about time-saving tools.

2.3 Brainstorming

Ideas considered: Image-to-recipe, ingredient-based generation, nutrition calculator. Final focus: Topic-to-full-blog-post using powerful LLM (Gemini) for high-quality text output. Added word count control for flexibility (short social posts to detailed blogs).

3. REQUIREMENT ANALYSIS

3.1 Customer Requirement

- Easy input: Text box for topic, dropdown for word count.
- Fast generation: <30 seconds response.
- Structured output: Title, meta (time, servings, difficulty), sections (intro, ingredients, etc.).
- Engaging UI: Dark theme, loading animation/joke.
- Error handling: Invalid API key, empty input, API failures.

3.2 Solution Requirement

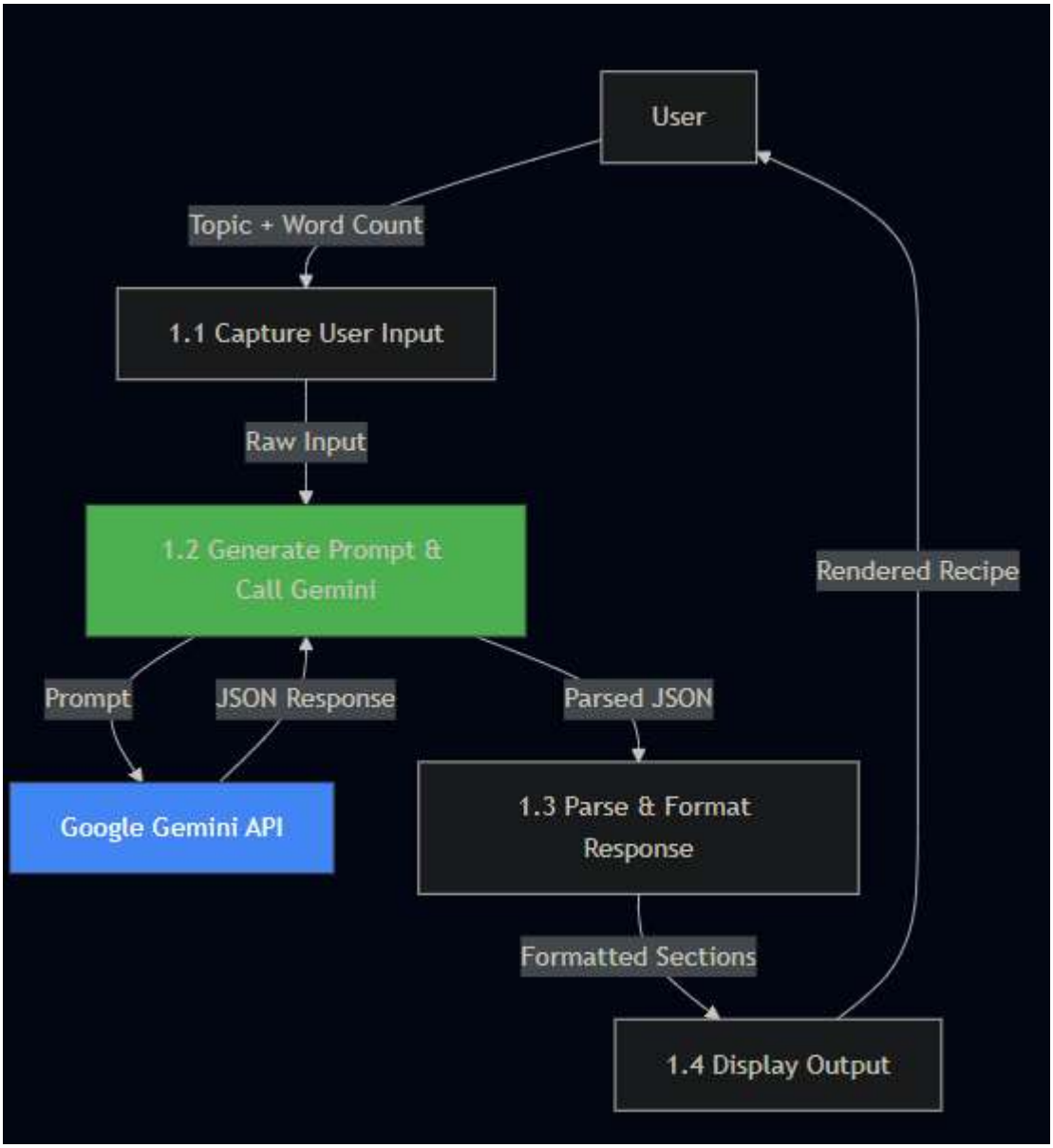
- Frontend: Interactive UI with real-time feedback.
- Backend: Python + Streamlit for logic + API calls.
- AI: Google Gemini 1.5-flash for structured JSON output.
- Deployment: Free hosting with auto-updates via GitHub.

3.3 Technology Stack

- Frontend/Backend: Streamlit (Python-based web framework)
- AI Model: Google Gemini API (gemini-1.5-flash)
- Language: Python 3.10+
- Libraries: google-generativeai, streamlit
- Deployment: Streamlit Community Cloud
- Version Control: Git + GitHub

3.4 Data Flow Diagram

4.



PROJECT DESIGN

4.1 Problem Solution

The solution transforms user natural language input into AI-generated, blog-ready content, reducing manual effort by 90%+.

4.2 Proposed Solution Fit

Fits perfectly for bloggers needing quick, unique content. Uses free-tier Gemini API (generous quota) + Streamlit (rapid prototyping).

4.3 Solution Architecture

- User interacts with Streamlit UI.
- Input captured → Prompt engineered with topic + word count + JSON schema.

- Prompt sent to Gemini API → Structured JSON returned.
- JSON parsed → Markdown/formatted display in UI.
- Session state handles "Generate Another" flow.

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

- Phase 1 (Week 1-2): Research Gemini API, Streamlit basics.
- Phase 2 (Week 3-4): Build basic UI + API integration.
- Phase 3 (Week 5): Add structured output, error handling, jokes.
- Phase 4 (Week 6): Testing, deployment, documentation.
- Tools: GitHub for version control, VS Code, Google AI Studio.

6. FUNCTIONAL AND PERFORMANCE TESTING

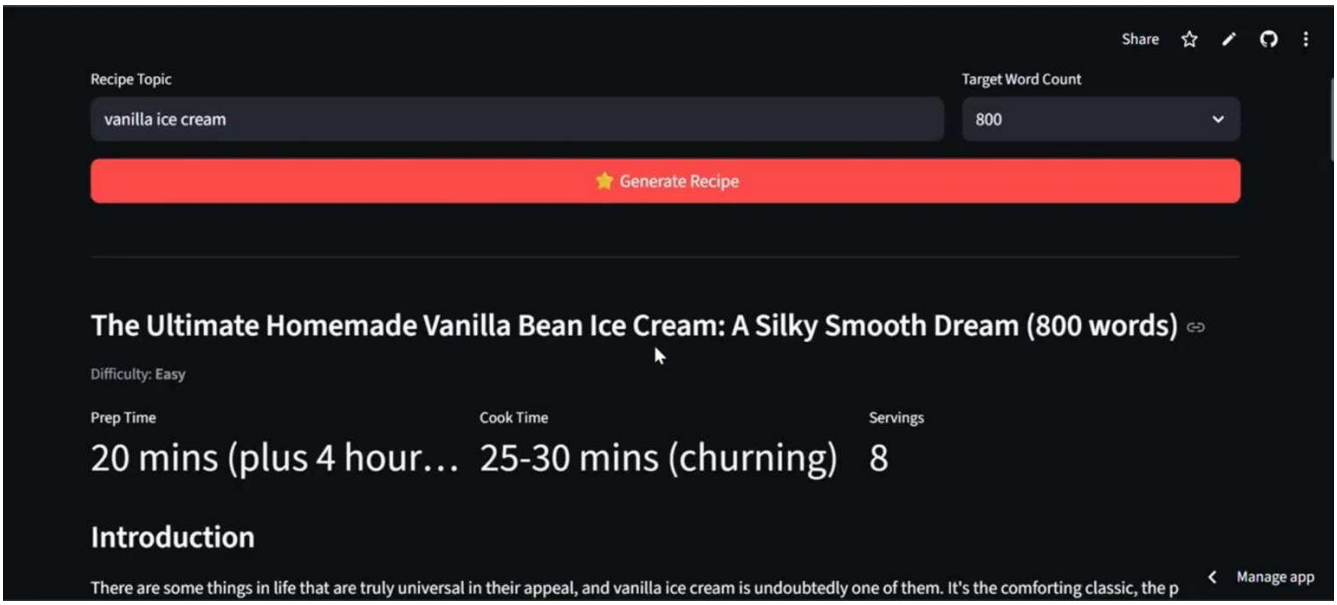
6.1 Functional Testing

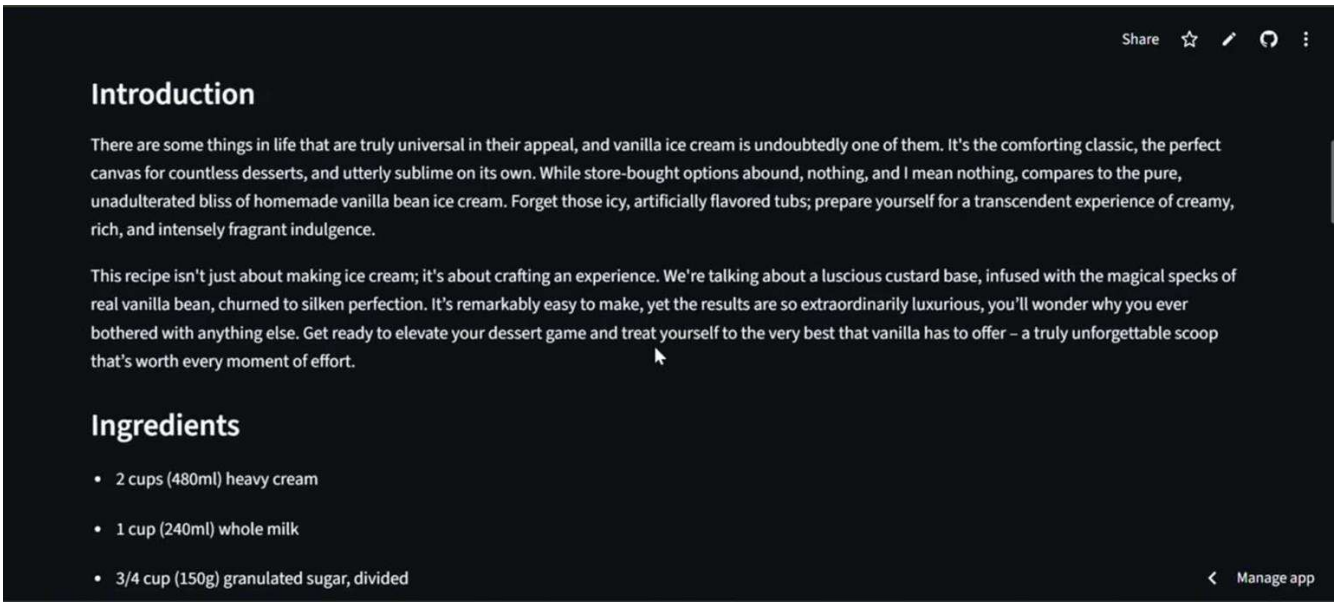
- Test cases: Empty topic → error shown.
- Valid topic → generates in 10-30s.
- Different word counts → content length varies.
- "Generate Another" → resets form.
- Copy button → works (navigator.clipboard).

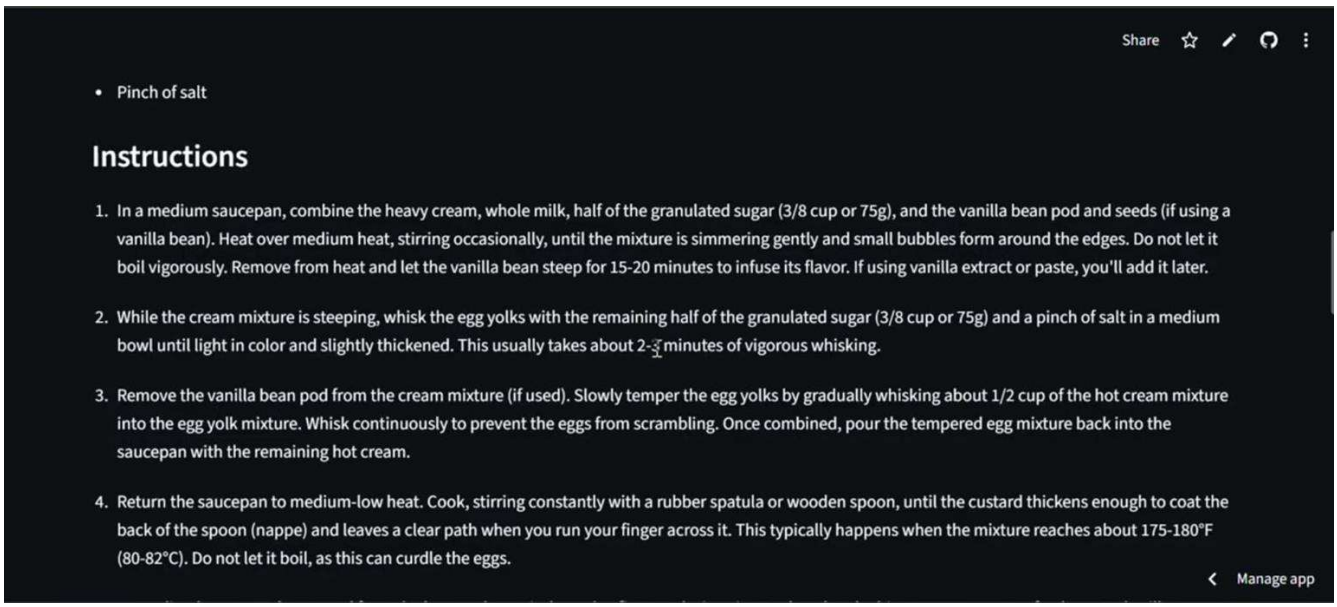
6.2 Performance Testing

- Response time: 8-25 seconds (Gemini API latency).
- Concurrent users: Tested locally with multiple tabs.
- API quota: Free tier handles 10-20 generations/day easily.

7. RESULTS


Share
Recipe Topic
vanilla ice cream
Target Word Count
800
Generate Recipe
The Ultimate Homemade Vanilla Bean Ice Cream: A Silky Smooth Dream (800 words)
Difficulty: Easy
Prep Time
20 mins (plus 4 hour…
Cook Time
25-30 mins (churning)
Servings
8
Introduction
There are some things in life that are truly universal in their appeal, and vanilla ice cream is undoubtedly one of them. It's the comforting classic, the p
Manage app


Share
Introduction
There are some things in life that are truly universal in their appeal, and vanilla ice cream is undoubtedly one of them. It's the comforting classic, the perfect canvas for countless desserts, and utterly sublime on its own. While store-bought options abound, nothing, and I mean nothing, compares to the pure, unadulterated bliss of homemade vanilla bean ice cream. Forget those icy, artificially flavored tubs; prepare yourself for a transcendent experience of creamy, rich, and intensely fragrant indulgence.
This recipe isn't just about making ice cream; it's about crafting an experience. We're talking about a luscious custard base, infused with the magical specks of real vanilla bean, churned to silken perfection. It's remarkably easy to make, yet the results are so extraordinarily luxurious, you'll wonder why you ever bothered with anything else. Get ready to elevate your dessert game and treat yourself to the very best that vanilla has to offer – a truly unforgettable scoop that's worth every moment of effort.
Ingredients
2 cups (480ml) heavy cream
1 cup (240ml) whole milk
3/4 cup (150g) granulated sugar, divided
Manage app


Share
Pinch of salt
Instructions
1. In a medium saucepan, combine the heavy cream, whole milk, half of the granulated sugar (3/8 cup or 75g), and the vanilla bean pod and seeds (if using a vanilla bean). Heat over medium heat, stirring occasionally, until the mixture is simmering gently and small bubbles form around the edges. Do not let it boil vigorously. Remove from heat and let the vanilla bean steep for 15-20 minutes to infuse its flavor. If using vanilla extract or paste, you'll add it later.
2. While the cream mixture is steeping, whisk the egg yolks with the remaining half of the granulated sugar (3/8 cup or 75g) and a pinch of salt in a medium bowl until light in color and slightly thickened. This usually takes about 2-3 minutes of vigorous whisking.
3. Remove the vanilla bean pod from the cream mixture (if used). Slowly temper the egg yolks by gradually whisking about 1/2 cup of the hot cream mixture into the egg yolk mixture. Whisk continuously to prevent the eggs from scrambling. Once combined, pour the tempered egg mixture back into the saucepan with the remaining hot cream.
4. Return the saucepan to medium-low heat. Cook, stirring constantly with a rubber spatula or wooden spoon, until the custard thickens enough to coat the back of the spoon (nappe) and leaves a clear path when you run your finger across it. This typically happens when the mixture reaches about 175-180°F (80-82°C). Do not let it boil, as this can curdle the eggs.
Manage app

8. ADVANTAGES & DISADVANTAGES

Advantages

- Saves hours of writing time.
- Generates unique, professional content.
- Customizable word length.
- Free to use/deploy.
- Fun UX with loading jokes.

Disadvantages

- Dependent on Gemini API availability/quota.
- AI may occasionally hallucinate minor details.
- No image generation (text-only).
- Requires valid API key.

9. CONCLUSION

Flavour Fusion successfully demonstrates how generative AI (Google Gemini) can be integrated into a simple, user-friendly web app using Streamlit to solve real-world content creation problems in the food blogging domain. The project achieves fast, structured recipe generation with minimal user effort. It proves the power of modern LLMs for creative applications and serves as a strong prototype for future enhancements.

10. FUTURE SCOPE

- Add user authentication & saved recipes.
- Support image upload → generate recipe from photo.
- Integrate nutrition calculator API.
- Multi-language recipes.
- Voice input for topic.
- Export to PDF/Word for bloggers.
- Fine-tune model on custom recipe dataset.

11. APPENDIX

11.1 Source Code:

- Full code available at: https://github.com/moinm8461-glitch/Flavour_Fusion

11.2 Dataset Link

No external dataset used (real-time generation via LLM). Prompt engineering handles structure.

11.3 GitHub & Project Demo Link

- GitHub Repository: https://github.com/moinm8461-glitch/Flavour_Fusion
- Live Demo: https://farashmoin7.streamlit.app/
- Demo Video: https://drive.google.com/file/d/1KzOTY-jUO88JL_l0ZCYePvnLOqIKl4j-/view?usp=drivesdk