

PROJECT REPORT : FLAVOR FUSION AI DRIVEN RECIPE BLOGGING

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1. INTRODUCTION

1.1 Project Overview

Flavour Fusion is an AI-powered web application designed to automate the creation of professional-quality recipe blog posts. Users simply provide a recipe topic (for example, “Vegan Chocolate Cake” or “Quick Chicken Biryani”) and choose a desired word count. Based on these inputs, the application utilizes Google’s Gemini AI model to generate well-structured and engaging recipe content, including sections such as title, introduction, ingredients, step-by-step instructions, tips, serving suggestions, and storage guidelines.

The application features a clean, dark-themed user interface built using Streamlit, enhancing usability and overall user experience. To make the waiting time more engaging, random cooking-themed jokes are displayed while the content is being generated. The project is deployed on Streamlit Community Cloud, allowing free and easy public access. Purpose

1.2 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

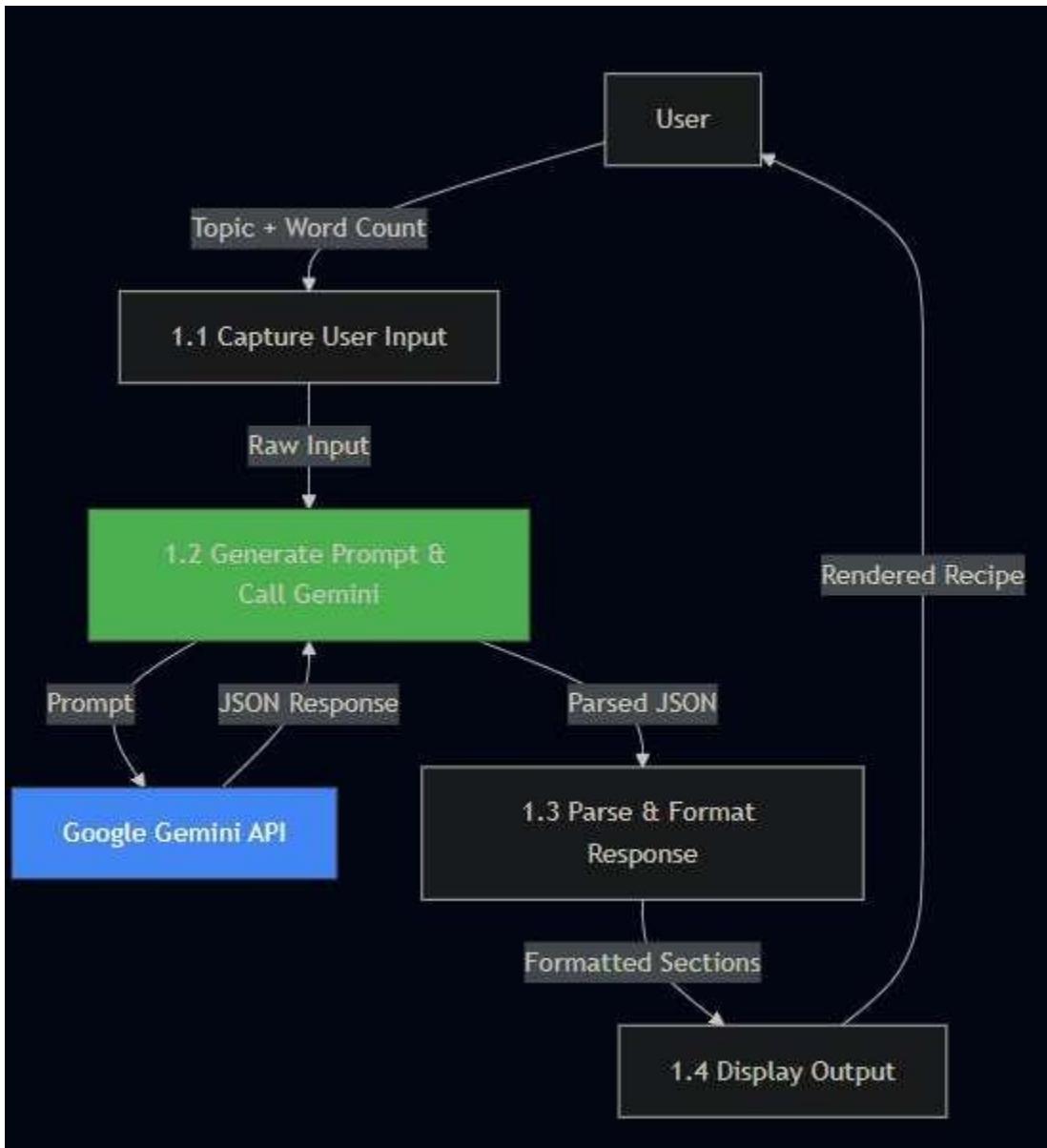
- Frontend: Interactive UI with real-time feedback.
- Backend: Python + Streamlit for logic + API calls.
- AI: Google Gemini 1.5-flash for structured JSON output.
- Deployment: Free hosting with auto-updates via GitHub.

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



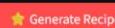
Flavour Fusion

AI-Driven Recipe Blogging • Powered by Gemini

AI-powered recipe blogging made simple!

Cook Up Something New

Recipe Topic: biriyani Target Word Count: 2000 Category: Quick Meals



The Weeknight Biryani Revolution: Your Quick & Flavorful One-Pot Masterpiece (2000 words)

The Weeknight Biryani Revolution: Your Quick & Flavorful One-Pot Masterpiece (2000 words)

Difficulty: Medium

Prep Time: 30 minutes (plus 30-60 min ... Cook Time: 45-55 minutes Servings: 4

Introduction

Close your eyes. Imagine the intoxicating aroma of fragrant basmati rice, tender, spice-infused chicken, caramelized onions, and fresh herbs dancing in the air. That, my friends, is the magic of Biryani – a dish so profoundly flavorful, so deeply satisfying, it transcends mere food and becomes an experience. For many, Biryani is the undisputed king of Indian cuisine, a culinary masterpiece revered for its complexity, its layers of flavor, and the time-honored tradition of its preparation.

But let's be honest. The very mention of 'Biryani' often conjures images of elaborate weekend projects, hours spent meticulously layering, slow-cooking over 'dum,' and a mountain of pots and pans. It's a dish we reserve for special occasions, for lazy Sundays, or for ordering from our favorite Indian restaurant when the craving becomes unbearable. The idea of whipping up a Biryani on a busy Tuesday evening? Utterly preposterous, right? A culinary pipe dream, an impossibility for the modern, time-strapped home cook.

Well, my fellow food adventurers, prepare to have your perceptions shattered! What if I told you that the Biryani of your dreams – yes, that aromatic, spice-laden, soul-warming Biryani – could be a weeknight reality? What if you could achieve a remarkably authentic and incredibly delicious Biryani experience in under 1.5 hours, from start to finish, with minimal fuss and a single pot? You'd probably think I've either lost my mind or discovered some ancient, secret Biryani hack. And frankly, it's a bit of both!

Welcome to the Weeknight Biryani Revolution! This isn't just a recipe; it's a paradigm shift in how you approach one of the world's most beloved dishes. We're taking the essence of traditional Biryani – the fragrant rice, the succulent meat, the symphony of spices – and streamlining the process without sacrificing an ounce of its soul. This isn't a pale imitation; it's a vibrant, flavorful, and incredibly satisfying dish that will make you question why you ever thought Biryani had to be a marathon.

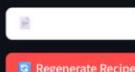
Why this Quick Biryani is a Game-Changer:

1. Time-Efficiency without Compromise: We've cleverly adapted traditional techniques to fit a tighter schedule. While a traditional 'dum' Biryani might involve hours of slow cooking, our method ensures the flavors meld beautifully in a fraction of the time, thanks to strategic layering and smart cooking techniques.

- **Papadums:** Crispy roasted or fried papadums offer a delightful textural contrast.
- **Mirchi ka Salan:** For those who love an extra kick, a side of tangy, spicy green chili curry is a traditional pairing.
- **Pickle:** A small dollop of your favorite Indian pickle can add an intense burst of flavor.
- **Presentation:** Serve in a large, shallow dish, gently fluffing the rice and chicken to showcase the layers and colors. Garnish generously with fresh coriander, mint, and fried onions.

Storage

Leftover Biryani can be stored in an airtight container in the refrigerator for up to 2-3 days. Reheat gently in a microwave or on the stovetop with a sprinkle of water to prevent drying out. You can also freeze Biryani for up to 1 month; thaw overnight in the refrigerator before reheating.



Generate Another Recipe

Why Food Bloggers Love Flavour Fusion

Endless Inspiration

Any cuisine, any diet, instant ideas.

Save Time

Blog-ready in seconds.

Pro Quality

Structured & engaging content.

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/BalaSainadhReddy/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/BalaSainadhReddy/Flavour_fusion
- Live Demo: <https://flavourfusion-balu.streamlit.app/>
- Demo Video: https://drive.google.com/file/d/1E5DxpM88KXsrBvWvmZ3kEICQDRnjOf-9/view?usp=drive_link