A

P R O J E C T R E P O R T

on

"Text to Image Generation"

Submitted by

Akshata Bilale (TE-A-C01)

Nitesh Jha (TE-A-C02)

Tarun Karikalcholan (TE-A-C03)

Under the guidance of

PROF. SUDHAKAR JADHAV

Department of Information Technology

Datta Meghe College of Engineering,

Sector-3, Airoli, Navi Mumbai – 400 708, (M.S.), INDIA

2024-2025

Datta Meghe College of Engineering

(AICTE & Govt. of Maharashtra Recognized, Affiliated to University of Mumbai)

Department of Information Technology

C E R T I F I C A T E

This is to certify that **Mr. Soumitra Jadhav** of Information Technology TE-A, Roll No. 41 Lab Project entitled "Workout Tracker" has executed the project work carried out by him under my guidance and supervision within the institute.

Signature of the Guide **Signature of Head of Department**

Examined on:

Examiner 1 **Examiner 2**

Mini-Project Report: Text to image generation and store image in database

---

1. Abstract

This project presents a mobile/web application that generates images from textual input using a powerful text-to-image generation model, Stable Diffusion. The primary goal is to convert descriptive text prompts into visually appealing images and store them efficiently in a cloud-based database for easy access and management. The application integrates Firebase as the backend database, leveraging its real-time data capabilities and storage features to manage user-generated images and associated metadata. Upon entering a text prompt, the app communicates with the Stable Diffusion API to generate an image that matches the given description. The generated image is then uploaded to Firebase Storage, while the corresponding prompt and image URL are stored in Firestore for retrieval and display. This project combines the power of AI-driven content generation with cloud storage, offering users a seamless and innovative way to visualize ideas and maintain a personal image database.

---

2. Contents

---

3. List of Figures and Tables

---

4. Chapter-1: Introduction

4.1 Introduction

With the growing demand for creative and intelligent mobile applications, converting text into images has become a fascinating and useful feature. This project focuses on building a **mobile application** that allows users to generate images simply by entering descriptive text. The app uses the **Stable Diffusion API**, a powerful text-to-image generation service, to create visually realistic images based on user prompts.

Once an image is generated, it is automatically stored using **Firebase** — a cloud-based platform used for storing and managing both the image and the associated text prompt. **Firebase Storage** is used to upload and save the image files, while **Firestore** stores the metadata such as the user input and image URL for easy access and retrieval within the app.

This project demonstrates how artificial intelligence can be integrated into a mobile app through APIs, making complex features like image generation accessible and user-friendly. It combines creative AI tools with cloud storage technology to provide a seamless and efficient image generation experience for users.

4.2 Literature Survey

Generative Adversarial Networks (GANs):
GANs have been one of the earliest models used in text-to-image generation. Models like **StackGAN** and **AttnGAN** were developed to generate images by progressively improving quality and focusing on attention mechanisms within the text. However, these models required large datasets and high computational resources for training.

Diffusion Models:
More recently, **diffusion models** have shown superior performance in generating high-quality images. One of the most notable models is **Stable Diffusion**, developed by Stability AI. It uses a latent diffusion approach that reduces computation while maintaining high image fidelity. This model is capable of producing photorealistic images from detailed or even abstract text prompts.

APIs for AI-Powered Image Generation:
Instead of training complex models locally, developers now use hosted APIs that offer pre-trained models as a service. Platforms like **Stability AI**, **Replicate**, and **Hugging Face** provide APIs to access Stable Diffusion models. These APIs make it easy to integrate AI-generated images into applications without needing deep ML knowledge.

4.3 Problem Definition

Build a mobile app that converts text descriptions into images using a Stable Diffusion API and securely stores the images and related metadata in Firebase.

4.4 Objectives

- **User Input:** Allow users to enter descriptive text.

- **Image Generation:** Integrate with the Stable Diffusion API to generate images from text.
- **Cloud Storage:** Store generated images in Firebase Storage.
- **Metadata Management:** Save text prompts and image URLs in Firestore.
- **Performance:** Ensure a seamless, responsive experience on mobile devices.

4.5 Proposed Solution

Create a mobile app with a simple text input interface.
Use the Stable Diffusion API to generate images from input text.
Retrieve the generated image in real time.
Store the image in Firebase Storage.
Save text prompts and image URLs in Firestore for retrieval.

4.6 Wireless Technology Used

- Flutter Application Development

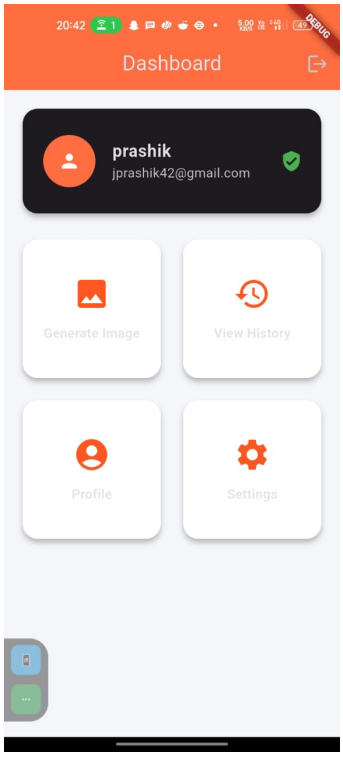
---

5. Chapter-2: System Design

5.1 User Interface & Screenshots

The following screenshots provide a visual overview of the application's core functionalities and interface design:

- **Fig 1.1: App Home Screen** – This screen shows dashboard of the



- **Fig 1.2: City Search Feature** – This UI allows the user to enter a prompt and generate image

5.3 Hardware and Software Requirements

[Table 1.1]

Component	Specification/Tool
Hardware	Smartphone (Android/iOS)
IDE	Android Studio, VS Code
Programming Language	Dart
Framework	Flutter SDK
API Service	Stable Diffusion

5.4 Cost Estimation

- Development tools: Free (open source)
- Device: Approx ₹10,000+ (for testing on Android/iOS)

---

6. Chapter-3: Implementation

6.1 Project Structure

The app is divided into three main layers:

- **Authentication Layer** – Authenticates user to provide service
- **API Layer** – Interacts with stable diffusion api to generate images
- **Storage Layer** – images generated by user are stored in the firebase realtime databa

6.2 Error Handling

- Uses try-catch blocks for network failures.
- Displays toast messages if permissions are denied.
- Uses `shared_preferences` to load last session data.

6.3 Future Directions

- Dynamic backgrounds and theme changes.
- Ai video Generation

---

7. Chapter-4: Testing and Results

7.1 Testing Methods

- Manual testing on Android emulator and physical device.

7.2 Results

- The app successfully fetched and displayed weather data.
- Accurate display of temperature and conditions.
- Graceful error messages when connectivity or location was unavailable.
- Efficient loading and saving of last city data.

---

8. Chapter-5: Conclusion

This project demonstrates the practical integration of AI-based text-to-image generation with cloud-based storage solutions in a mobile application setting. By utilizing the Stable Diffusion API, the app effectively translates user input into high-quality images, while Firebase provides robust storage and data management through its Storage and Firestore services. This combination not only streamlines the process of generating visual content but also ensures that data is managed securely and can be accessed in real time. Overall, the project offers a scalable and user-friendly approach to harnessing cutting-edge AI technology for creative mobile applications, paving the way for future enhancements and wider applications in digital content creation and management.

---

9. References

1. Flutter Documentation - https://docs.flutter.dev