SaaS App – AI Image Generator

A report submitted in partial fulfillment of the requirement for the award of the degree Of

Bachelor of Technology in Computer Science & Engineering

in

Faculty of Engineering

Submitted by

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Guwahati-26, Assam
Session: July-December, 2025

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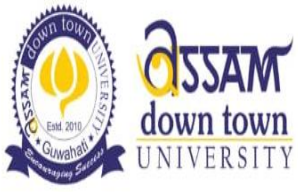

DECLARATION

We, **MD AMIT HASAN ROBI** bearing Roll No. **ADTU/0/2023-27/BTCS/210**, and **MD SAMIUR RAHMAN TANIM** bearing Roll No. **ADTU/0/2023-27/BTCS/212**, hereby declare that the project entitled **"SaaS App – AI Image Generator"** is an original work carried out in the **Department of Computer Technology, Assam down town University, Guwahati**, with the exception of guidance and suggestions received from our supervisor, **Dr. Prasenjit Kr. Das**, Assistant Professor, Department of Computer Technology, Assam down town University, Guwahati.

The design, development, data, and findings presented in this report are the result of our own effort and research. This report is being submitted to **Assam down town University** in partial fulfillment of the requirements for the degree of **Bachelor of Technology (B.Tech)** in **Computer Science and Engineering**.

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Program: B. Tech (CSE)

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ACKNOWLEDGMENT

We would like to extend our heartfelt appreciation to everyone who contributed to the successful completion of our project titled **"SaaS App – AI Image Generator."** This work would not have been possible without the constant support, encouragement, and cooperation of many individuals.

We express our sincere gratitude to our supervisor, **Dr. Prasenjit Kr. Das**, Assistant Professor, Department of Computer Technology, Assam down town University, Guwahati, for his valuable guidance, constructive suggestions, and continuous support throughout the development of this project. His insights and feedback greatly enriched the quality of our work.

We also thank our project team members for their dedication, collaboration, and collective effort in shaping this project. Each member contributed meaningfully to the design, development, and successful execution of the work.

Finally, we are deeply grateful to our friends and family for their patience, motivation, and constant encouragement during the entire duration of this project. Their support helped us stay focused and overcome challenges along the way.

ABSTRACT

The **"SaaS App – AI Image Generator"** is a web-based platform that allows users to generate high-quality AI images using simple text prompts. It includes features like user login, credit-based image generation, history tracking, pricing plans, and customizable settings.

The system is built with **Vite, TypeScript, React, shadcn-ui, and Tailwind CSS**, ensuring a fast and responsive user experience. Image generation is powered by the **Lovable AI Gateway** using the **google/gemini-2.5-flash-image-preview** model without the need for external API keys.

An admin panel is provided for managing users, tracking income, and monitoring system activity. Overall, the project demonstrates modern web development practices, AI integration, and scalable SaaS architecture for creative and automation-focused use cases.

1. INTRODUCTION

1.1 Overview of the project

The **SaaS App – AI Image Generator** is a web-based platform that allows users to generate high-quality AI images using simple text prompts. The system provides login, credit-based usage, image history, and customizable settings. The application is built using **Vite, TypeScript, React, shadcn-ui, and Tailwind CSS**, while image generation is handled through the **Lovable AI Gateway** using the **google/gemini-2.5-flash-image-preview** model. The platform offers a clean UI, fast performance, and smooth workflows, making it useful for designers, students, and content creators.

1.2 Motivation

The motivation behind this project comes from the increasing demand for easy and accessible AI tools. Many people want to create images but do not have advanced design skills or access to complex AI systems. This project aims to provide a simple, browser-based solution where anyone can generate images instantly. The goal is to make AI creativity more accessible, reduce technical barriers, and give users a modern tool for fast content creation.

1.3 Scope and Objective

The scope of this project includes developing a complete SaaS platform with features such as user authentication, pricing plans, credit management, image generation, and history tracking. It also includes an admin panel for managing users and income data.

The main objectives are:

- To provide an easy platform for generating AI images.
- To ensure fast performance and responsive UI.
- To offer secure login, credit handling, and user data management.
- To create a scalable SaaS system that can serve many users efficiently.

1.4 Existing system

Most existing AI image generation platforms are either complicated to use, require paid external API keys, or are not beginner-friendly. Many tools also lack features like usage tracking, history management, or a clean dashboard. Some platforms are slow, not mobile-responsive, or difficult for new users to understand. These limitations create a need for a simpler, faster, and more accessible AI image generation system.

1.5 Problem Definition

Users often struggle with AI tools that require complex setups, external APIs, or heavy technical knowledge. Existing systems may have limited features, confusing interfaces, or poor performance. There is a need for a platform that is easy to use, secure, fast, and suitable for both beginners and creators. This project aims to solve these issues by providing a smooth and reliable SaaS-based AI Image Generator with built-in authentication, credit usage, and history tracking.

1.6 Proposed System

The proposed system provides a modern SaaS platform where users can generate AI images instantly using simple prompts. It is built with **Vite, TypeScript, React, shadcn-ui, and Tailwind CSS**, and uses the **Lovable AI Gateway** for fast image generation without external API keys. The system includes features like login, pricing, credit system, image history, settings, and an admin panel for managing users and income. The platform is responsive, secure, and designed to offer a smooth, user-friendly experience for everyone.

2. PROJECT ANALYSIS

2.1 Project Requirement Analysis

The project involves developing a SaaS-based AI Image Generator, which requires analyzing both functional and non-functional requirements. Inputs from potential users and creators help identify key features such as user login, credit system, image generation, history tracking, and admin management.

Functional requirements are documented to guide the design, while non-functional requirements—like performance, security, scalability, and ease of use—ensure a smooth and reliable user experience. Basic prototypes and user feedback will be used to validate and refine these requirements. This analysis forms the base for creating a secure, responsive, and user-friendly AI image generation platform.

2.3 Advantage and Disadvantage

Advantage:

1. **Fast Image Generation:** Users can instantly create AI images from prompts.

2. **Easy to Use:** Simple, clean, and responsive interface for all users.

3. **Built-in Management:** Credit system, history tracking, and admin controls improve usability.

5. **Data Storage & Analysis:** Stores user performance data for future review and analytics.

Disadvantages:

1. **Internet Required:** The app depends on a stable connection for AI generation.

2. **Server Load:** Heavy usage may affect speed if not scaled properly.

3. **Limited Offline Access:** Image generation cannot work without the AI gateway.

2.4 Project Lifecycle

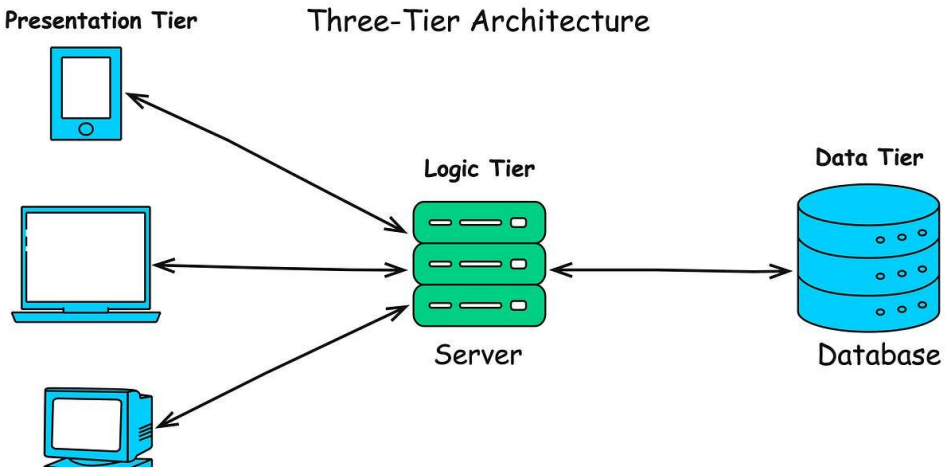
1. **Planning & Design:** Define features, choose tech stack (Vite, React, TS), and design UI and system structure.
2. **Development:** Build user panel, admin panel, credit system, and integrate AI image generation using the Lovable AI Gateway.
3. **Testing & Deployment:** Test all modules and deploy the SaaS app, followed by ongoing updates and maintenance.

2.5 Project feasibility

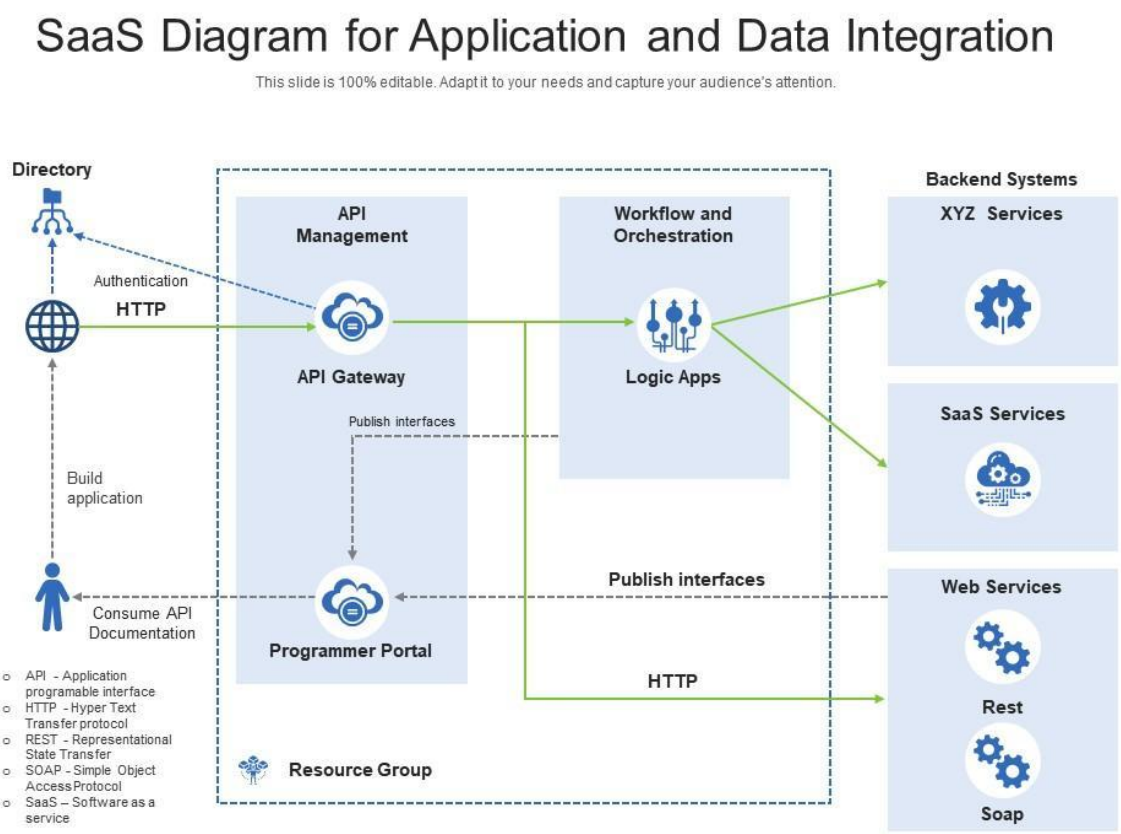
1. **Technical Feasibility:** The project is feasible using modern tools like React, TypeScript, Tailwind, and the Lovable AI Gateway.
2. **Economic Feasibility:** Low development cost due to open-source tools and built-in AI gateway (no external API keys needed).
3. **Operational Feasibility:** User-friendly interface, easy to maintain, and scalable for future features.

3. PROJECT DESIGN

3.1 System Architecture

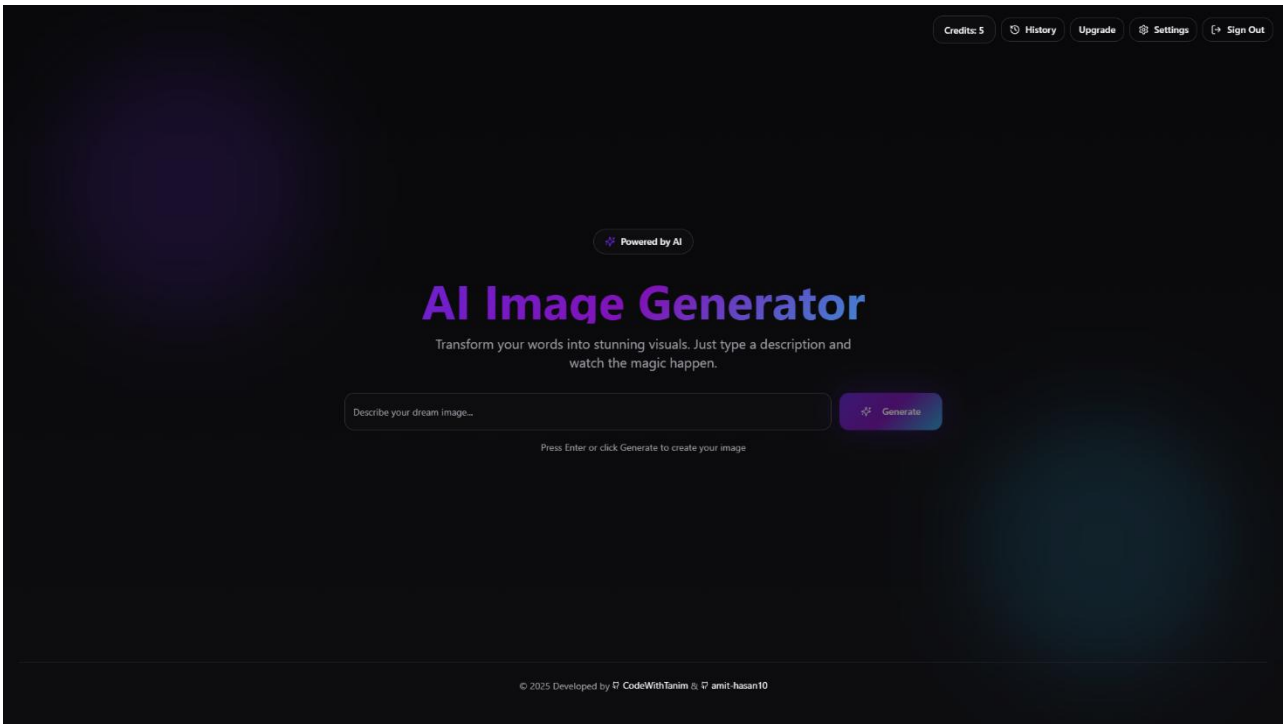


3.2 SaaS Diagram for Application and Data Integration

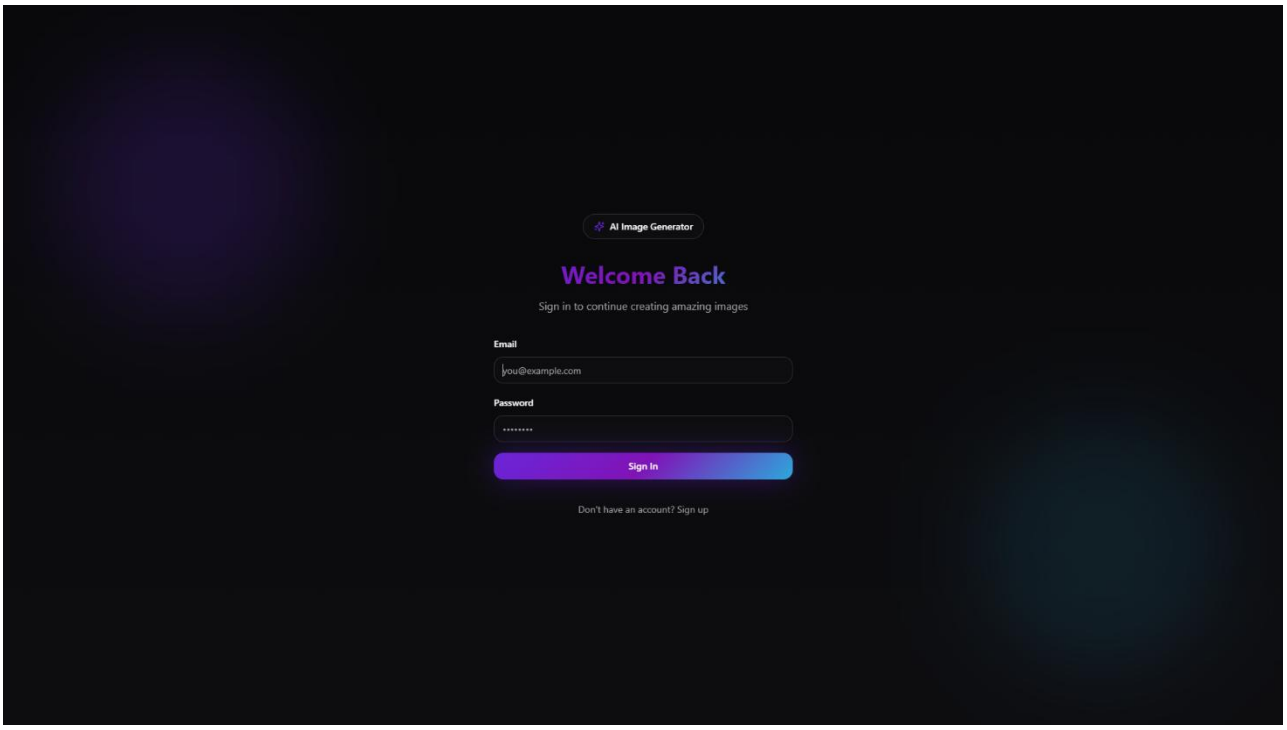


4.2 Wireframes/ Ui

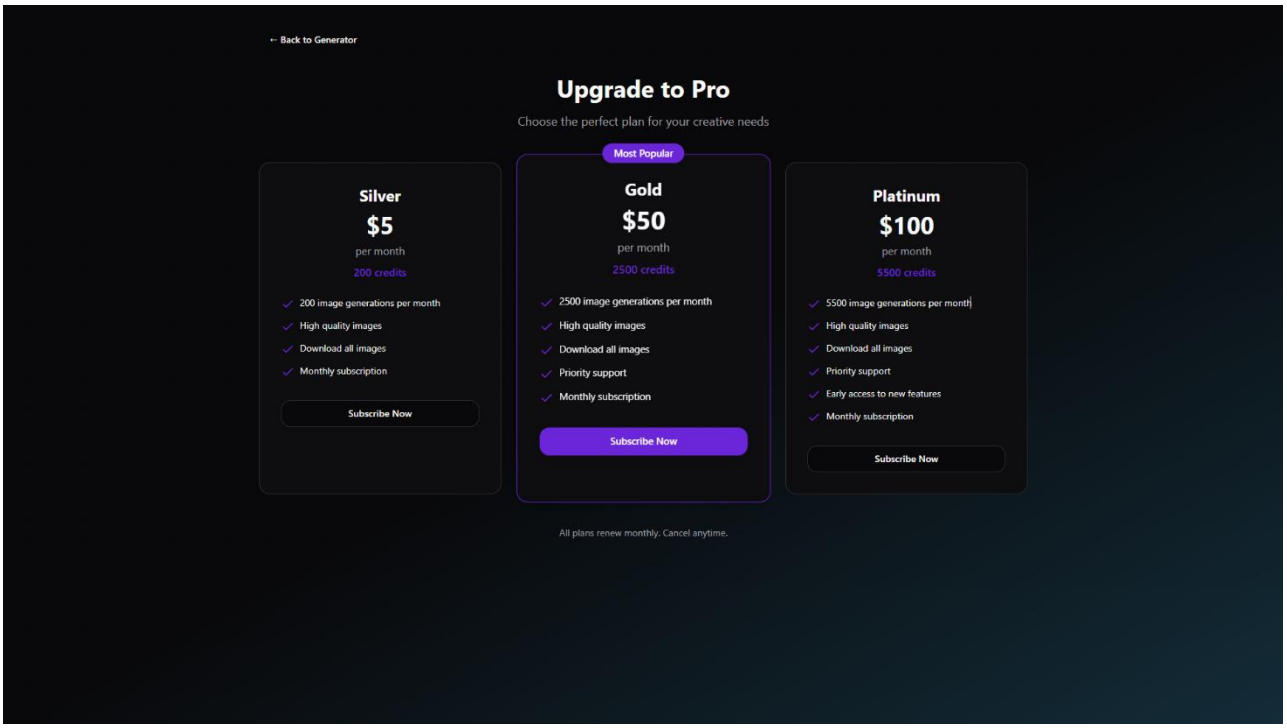
Home Page



Login page



Pricing page



6.1 Conclusion

The **SaaS App – AI Image Generator** provides a simple and efficient platform for generating AI-powered images through a modern web interface. Built using **Vite, React, TypeScript, shadcn-ui, and Tailwind CSS**, the system ensures fast performance, responsive design, and secure data handling. Image generation is powered by the **Lovable AI Gateway**, enabling high-quality outputs without external API keys.

Key features such as user login, credit-based generation, image history, pricing options, and an admin dashboard create a smooth experience for both users and administrators. The system improves the traditional design process by offering automation, speed, and easy accessibility.

Thorough testing—including functional, integration, and performance tests—ensures stability and reliability throughout development. This project demonstrates the potential of modern web technologies and AI integration in building scalable, interactive, and user-friendly creative tools, providing a solid foundation for future improvements.

6.2 References:

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