Memory Box

Virja Surve[1], Mrudula Gaikwad[2], Shobhana Gaikwad[3]

Students, Department of Computer Technology[1,2]

Lecturer, Department of Computer Technology[3]

Bharati Vidyapeeth Institute of Technology, Navi Mumbai, Maharashtra, India

Abstract*: In the modern digital age, effectively organizing and preserving memories has become increasingly important. This Photo Management Application offers a seamless way for users to store, retrieve, and edit their photos while ensuring an intuitive and engaging experience. With user authentication, individuals can securely create and manage their personal galleries.*

The Home Page features a search bar, allowing users to quickly find photos based on specific dates or captions. A slideshow of recently uploaded images enhances accessibility, while the album creation feature helps in organizing photos into well-structured collections. Selecting an album displays a yearly calendar view, enabling users to upload images on specific dates. To enhance stored photos, the application includes built-in editing tools such as cropping and caption addition.

The frontend of the application is built using TypeScript, CSS, and HTML, ensuring a visually appealing and responsive interface. The backend is powered by Supabase, providing efficient data management and storage solutions. This technology stack ensures a smooth and reliable user experience.

This project aims to simplify digital photo organization by offering a user-friendly and interactive platform for storing, searching, and editing memories with ease..

Keywords: Photo Management, User Authentication, Image Search, Album Creation, Photo Editing, Yearly Calendar, TypeScript, Supabase, Interactive UI

I. INTRODUCTION

As digital photography continues to grow, managing and organizing photos efficiently has become a common challenge. This **Photo Management Application** is developed to provide users with a structured and convenient way to store, search, and edit their digital memories. With a focus on user-friendliness, the system integrates features that simplify photo organization and enhance accessibility.

The application addresses key challenges in photo management:

Simplified Organization – Users can create albums to categorize photos, making it easier to store and retrieve them.

Quick Search & Retrieval – A built-in search function allows users to locate photos based on specific dates or captions.

Built-in Editing Tools – Users can crop images and add captions to personalize and enhance their photos.

Developed using **TypeScript, CSS, and HTML**, the application delivers a responsive and interactive interface. The backend, powered by **Supabase**, ensures secure user authentication and efficient photo storage. By integrating these features, the platform offers a smooth and intuitive experience, making digital photo management effortless.

II. LITERATURE SURVEY

With the increasing volume of digital photos, effective management and retrieval have become essential for users. While various photo management applications exist, many lack efficient organization, seamless search capabilities, and integrated editing tools. Popular solutions such as Google Photos and Apple Photos offer cloud-based storage but come with limitations, such as storage constraints or subscription costs. Meanwhile, advanced platforms like Adobe Lightroom prioritize editing features over structured photo organization, making them less user-friendly for individuals seeking simple yet effective photo management

Recent advancements in cloud storage, metadata-based search, and intuitive user interfaces have significantly improved the way users interact with digital photo libraries. Research indicates that applications with structured album management, metadata tagging, and search functionalities based on date and captions improve accessibility and user experience. Additionally, studies highlight the importance of a responsive and visually appealing interface, as users prefer platforms that provide easy navigation without unnecessary complexity.

This project incorporates these insights to create a comprehensive and user-friendly photo management system. By integrating secure user authentication, album-based organization, quick search functionality, and essential photo editing tools like cropping and caption addition, the application ensures an efficient and intuitive experience. Developed using TypeScript, CSS, and HTML for the frontend and Supabase for backend storage and authentication, the system offers a scalable, reliable, and interactive platform for managing digital memories effortlessly.

III. METHODOLOY

The development of this Photo Management Application follows a structured approach to ensure a smooth and intuitive experience for users. The system is built with a modular design, integrating frontend development, backend management, database handling, and photo processing features to facilitate efficient storage, retrieval, and editing of digital images.

3.1 System Architecture

The application is structured into three main layers, ensuring seamless interaction between components:

Frontend (User Interface Layer)

Developed using TypeScript, CSS, and HTML to provide a responsive and interactive user interface.

Features a search bar to help users locate photos by date or caption.

Displays a recent photos slideshow, allowing easy access to newly uploaded images.

Includes an album creation feature, enabling users to organize photos into categorized collections.

The UI is fully responsive, ensuring smooth navigation across different devices.

Backend (Application Layer)

Implemented using Supabase, handling user authentication, photo management, and metadata processing.

Manages photo uploads, album storage, and search functionality efficiently.

Ensures fast and secure interactions between the frontend and database.

Database (Storage Layer)

Utilizes Supabase for cloud storage, managing:

User authentication for secure access.

Photo metadata (date, caption, album reference).

Albums and their associated images for structured organization.

3.2 Frontend Development

The Home Page serves as the central interface, featuring a search bar, recent photos slideshow, and an album creation section.

Users can create and manage albums, which are displayed on the Home Page.

Clicking an album opens a yearly calendar view, allowing users to upload photos for specific dates.

The design ensures an interactive and accessible experience across all screen sizes.

3.3 Backend and Database Management

The backend, powered by Supabase, facilitates secure authentication and efficient photo handling.

Enables users to upload and categorize images with custom captions.

Implements a search function, allowing users to retrieve images based on date or caption.

Ensures a well-organized database structure for quick data retrieval and smooth performance.

3.4 Photo Upload and Editing Features

Users can upload photos directly from their gallery, selecting specific dates within their albums.

The platform offers essential editing tools, including:

Cropping to adjust image dimensions

Caption addition to personalize and categorize photos.

The editing interface is designed to be user-friendly and efficient, ensuring a smooth experience for managing digital memories.

By combining a scalable backend, well-structured database management, and an intuitive frontend, this application provides an efficient and user-focused solution for organizing and retrieving digital photos.

3.5 Workflow of Photo Management Application

Users begin by creating an account or logging in to access their personalized photo storage.

The Home Page provides key functionalities, including:

A search bar to find images by date or caption.

A slideshow displaying recently uploaded photos for quick access.

An album creation feature for organizing images into separate collections.

When an album is selected, a yearly calendar view appears, allowing users to:

Choose a specific date to upload photos directly from their gallery.

Add a custom caption for better organization.

Edit photos using built-in tools like cropping and filters.

Users can manage, modify, and retrieve their saved images at any time for a seamless experience.

3.6 Security Measures

User Authentication: Ensures that only authorized users can access their personal galleries.

Data Security: Photos and user data are securely stored in Supabase's cloud infrastructure, preventing unauthorized access.

Secure Upload Mechanism: Implements security protocols to protect images from unauthorized modifications.

3.7 Comparison with Existing Educational Platforms

Features	This Application	Google Photos	Dropbox	Apple Photos	
Free Access	Yes	Yes	Limited	Limited	Yes
Search by Date & Caption	Yes	Yes	No	No	No
Album Creation	Yes	Yes	Yes	Yes	No
Yearly Calendar View	Yes	No	No	No	No
PhotoEditing (Crop)	Yes	Yes	No	Yes	Yes
Caption Addition	Yes	Yes	No	Yes	No
Ad-Free Experience	Yes	No	Yes	Yes	No

3.8 Technologies Used:

| Components	Technology Used
Frontend	TypeScript, HTML, CSS
Backend	Supabase
Database	Supabase Cloud Storage
Photo Editing	JavaScript-based filters and cropping tools

Authentication	Supabase Auth

IV. RESULT

The front end of our project includes the Login Page (I), Home Page (II), Create Album (III), Upload Phoo (IV),(V), Album page(VI),Photo View ,Delete ,Save caption(VII),Search Album(VIII).
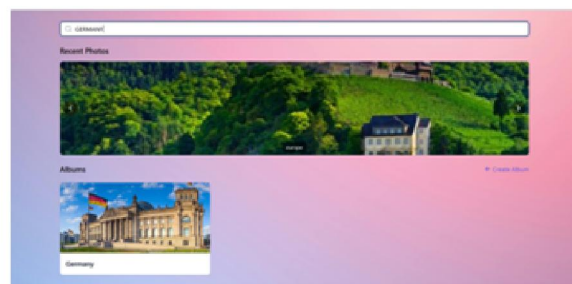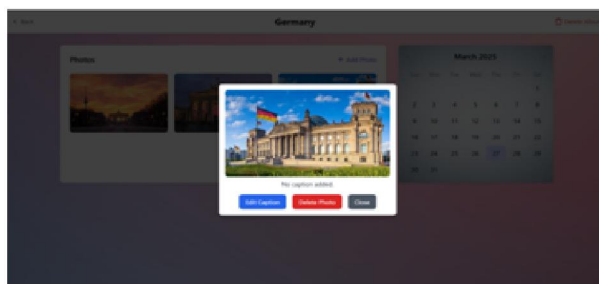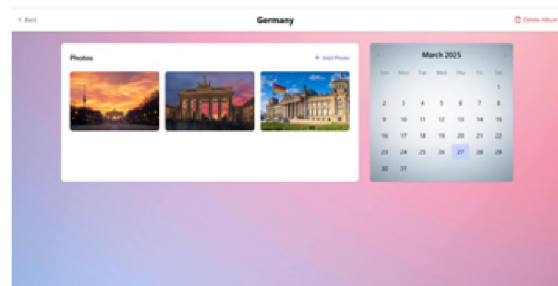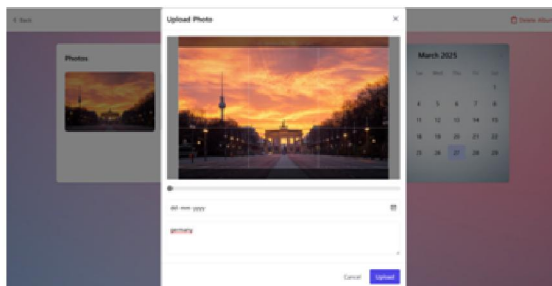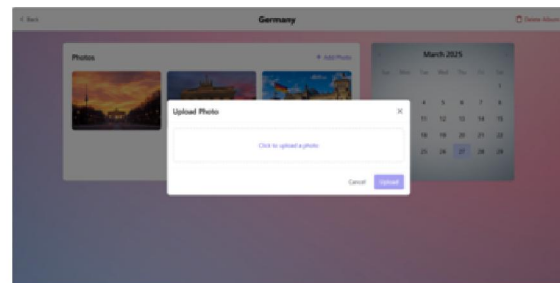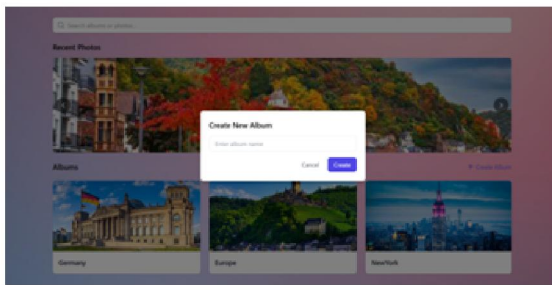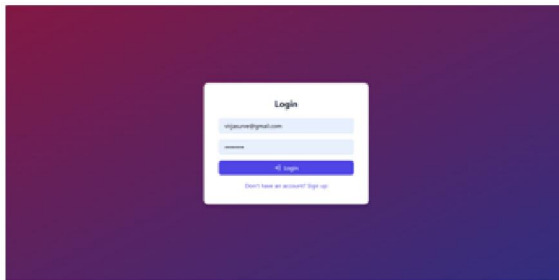
The Backend of our project includes the Database Schema Visualizer (I),Table Creation(II), Email Authentication(III), Authentication Policies(IV). Storage (V), Policies(VI), Project Preview (VII)
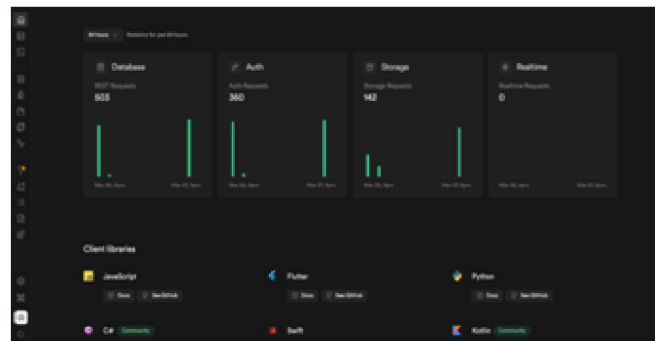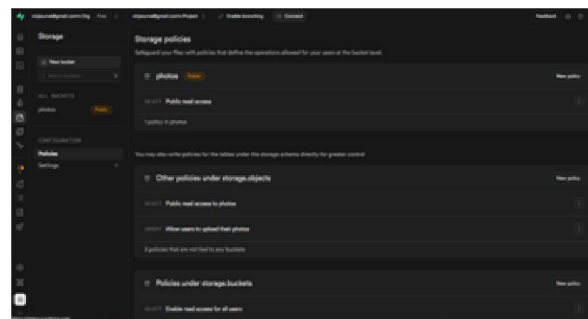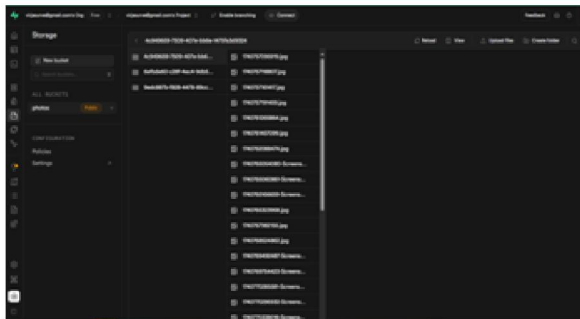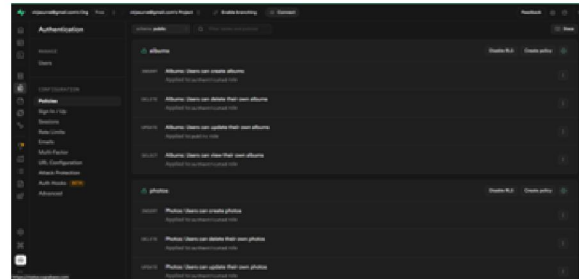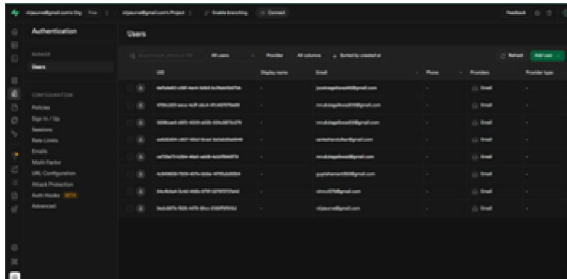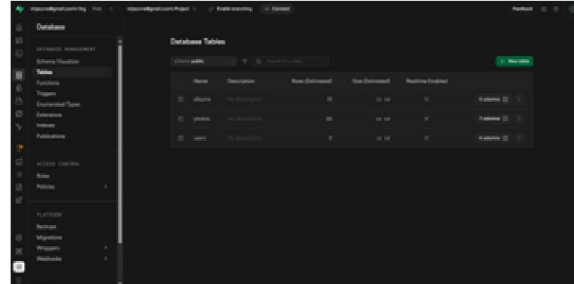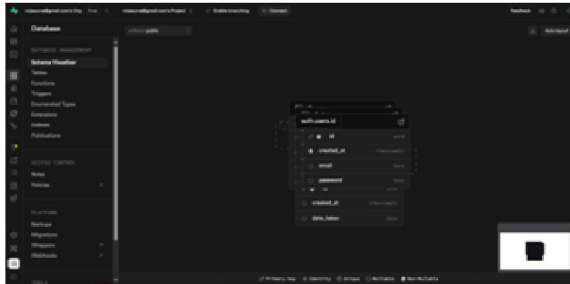
V. CONCLUSION

The **Photo Management Application** provides an organized and user-friendly approach to **storing, searching, and editing photos** efficiently. With features like **user authentication, album creation, a yearly calendar view, and a built-in search function**, users can manage their digital memories with ease. The ability to **retrieve images based on date or caption, organize them into albums, and apply basic editing tools such as cropping and captions** enhances the overall experience.

The backend, powered by **Supabase**, ensures **secure data storage and authentication,** protecting user information from unauthorized access. The inclusion of a **slideshow for recent uploads and an intuitive interface** makes navigation seamless and convenient.

While the application effectively addresses core photo management needs, there is potential for improvement. Future updates could include **expanded editing features, AI-based photo categorization, and a dedicated mobile application** to enhance accessibility. Integrating **cloud backups, facial recognition for searching, and automatic tagging** could further optimize the platform**.**

V. ACKNOWLEDGMENT

REFERENCES

[1] Supabase. The open-source Firebase alternative. Retrieved from https://supabase.com

[2]PostgreSQL. PostgreSQL Database Documentation.The app's backend is powered by PostgreSQL, hosted on Supabase.

It includes tables such as users, albums, and photos for managing user-generated content.

[3]React with Supabase.The project utilizes React and Supabase to handle user authentication, album creation, image storage, and search functionalities.

[4] Supabase Storage. File Storage API documentation. Images uploaded to albums are stored in Supabase Storage, with public URLs retrieved for display.

[5]Supabase Authentication. Authentication API Reference. Handles user login/logout and session management.

[6] Frontend UI with Tailwind CSS.The app uses Tailwind CSS for styling the user interface, ensuring a responsive and visually appealing design.

[7]Mozilla Developer Network (MDN). JavaScript and Web Development Resources.

[8]Stack Overflow. Community Discussions on Web Development.

[9] JavaScript Search & Filtering Techniques.