

COLLEGE CODE : 9623

COLLEGE NAME : Amrita College of Engineering and Technology

DEPARTMENT : Computer Science and Engineering

STUDENT NM-ID :

F4787BDFC4FD956815A4D77D2420B883

ROLL NO : 962323104045

DATE : 12-09-2025

Completed the project named as Phase 2

TECHNOLOGY PROJECT NAME : Dynamic Image Slider

SUBMITTED BY,

Name: JerbinRaj. S

Mobile no :7845638770

PHASE 2 – Solution & Architecture

Tech Stack Selection

1. Frontend:

HTML5 – Structure

CSS3 / Tailwind CSS – Styling & responsiveness JavaScript (ES6+) – Slider logic & DOM manipulation

2. Framework:

React.js (for scalability & component reusability)

Or Vanilla JS (for a simple slider)

3. Animations:

GSAP (Optional) – Advanced animations

4. Backend (Optional):

Node.js + Express.js – API for dynamic image

MongoDB / MySQL – Store image data

5. Tools & Deployment:

Git + GitHub – Version control

Vite / Webpack – Build & bundling (if using React)

Netlify / Vercel – Hosting and deployment

UPI Structure / API Schema Design

- Header – Displays project name and logo
- Image container – Shows current active image dynamically
- Prev/next Buttons – Manual navigation between images

- Footer - End of the page

API Schema Design 1.

Base URL

<https://api.dynamic-slider.com/>

2. Endpoints

`/api/images` - Get all slider images

`/api/images/:id` - Get a specific image by ID

`/api/images` - Add a new image (Admin)

`/api/images/:id` - Update existing image details (Admin)

`/api/images/:id` - Delete an image (Admin)

3. Image Object Schema

```
{  
  "id": 1,  
  "title": "Sunset View",  
  "imageUrl": "https://cdn.dynamic-slider.com/images/sunset.jpg",  
  "caption": "Beautiful sunset over the fields",  
  "order": 1,  
  "isActive": true,  
  "createdAt": "2025-09-12T10:00:00Z"  
}
```

Data Handling Approach

1. Frontend (Client-Side)

- Sends a GET `/api/images` request to fetch image data.

- Receives JSON response and dynamically renders slider images.
- Updates in real-time without reloading the page.

2. Backend (Server-Side)

- Handles CRUD operations: Create, Read, Update, Delete images.
- Validates input before storing.
- Returns clean JSON responses to the frontend.

3. Database Layer

- Stores metadata (title, caption, order, status, image URL).
- Example: MongoDB or MySQL.

4. Cloud Storage / CDN

- Stores actual image files (e.g., Cloudinary, Firebase).
- Provides fast, optimized delivery through CDN links.

5. Data Flow

- User → Frontend → API → Backend → Database + Cloud Storage → Frontend

Component / Module Diagram

1. App Root Module

- Acts as the entry point of the application.
- Loads global components like Header, Footer, and routing configuration.

2. Header Module

- Provides navigation and branding for the application.
- Components:

- Logo / Brand Name (Top left)
- Navigation Menu (e.g., Home, Dashboard, Admin)
- Core module where the image slider is displayed dynamically.

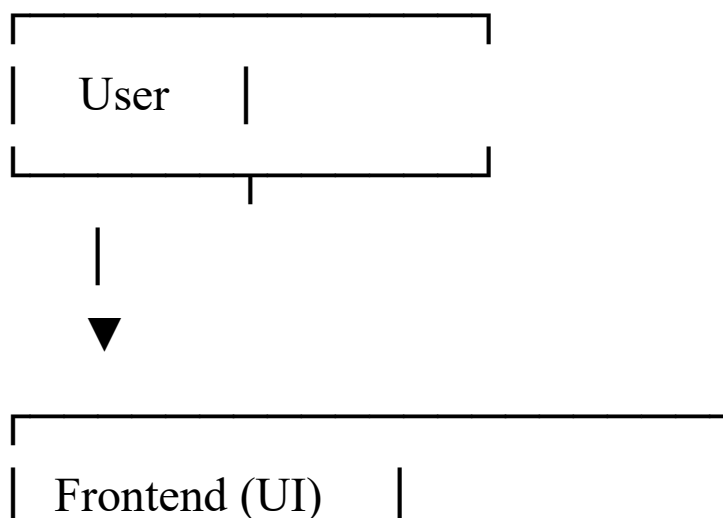
3. Main Dashboard Module

- Core module where the image slider is displayed dynamically.
- Fetches image metadata from the backend API.
- Allows admin users to add, edit, delete images (optional).
- Components:
 - Slider Component: Displays dynamic images.
 - Thumbnail Navigation (optional): Small preview images.
 - Add/Edit Image Modal: For admin use.

4. Data Flow Between Modules

- App Root → Header Module → Dashboard Module → Backend API
- App Root: Initializes the app and sets up routes.
- Header: Provides navigation across pages.
- Dashboard: Fetches data via API and renders slider.

Basic Flow Diagram



| - Header Module |

| - Dashboard Module |

| - Slider Component |

| API Request (GET / POST / PUT / DELETE)



| Backend (API) |

| - Node.js + Express |

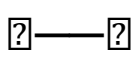
| - Routes & Logic |



| Database |

| (MongoDB) |

| Cloud Storage/CDN |



| (Cloudinary) |



| JSON Response |



Frontend Renders	
Dynamic Slider	