



COLLEGE CODE :9111

COLLEGE NAME :SRM MCET

DEPARTMENT :CSE

STUDENTNMROLLNO:

DC7B1736021F81EB85C40315A08C1F10

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Phase__1 TECHNOLOGY PROJECT

NAME :SINGLE PAGE APPILICATION

SUBMITTED BY,

NAME: PRIYADHARSHINI.G

MOBILENO: 7639065221

IBM-FE-Single Page Application

Phase 1 — Problem Understanding & Requirements

Problem Statement

The objective of this project is to build a Single Page Application (SPA) for IBM-FE that ensures smooth navigation, high responsiveness, and seamless integration with backend services. Traditional multi-page applications reload the entire page for every user interaction, which impacts user experience and performance.

By implementing an SPA, we aim to enhance user engagement by dynamically updating content without refreshing the page, reducing load times, and ensuring a modern and interactive interface. The application must prioritize scalability, accessibility, and security to align with enterprise standards.

Users & Stakeholders

The success of the application depends on addressing the needs of its key users and stakeholders:

1. ****End Users (Customers)****

- Expect smooth navigation without reloads.
- Require mobile-friendly and accessible interfaces.
- Need reliable and secure login and content access.

2. ****Admins****

- Require dashboards to manage content dynamically.
- Need visibility into user activities and analytics.
- Should be able to make updates without downtime.

3. ****Developers****

- Responsible for implementing frontend logic, API integration, and testing.
- Require clear documentation and modular architecture.- Ensure continuous deployment and maintainability.

4. ****Business Stakeholders****

- Demand performance monitoring and insights.
- Ensure alignment with business goals and ROI.

- Expect the application to meet deadlines and compliance standards.

User Stories

1. As a user, I want fast and seamless navigation, so I can access services without delays.
2. As a user, I want the application to be responsive, so I can use it on mobile, tablet, or desktop.
3. As an admin, I want to add or update content dynamically, so that users always get the latest information.
4. As an admin, I want secure login functionality, so that unauthorized users cannot access sensitive areas.
5. As a business stakeholder, I want detailed analytics dashboards, so I can track user engagement and performance trends.
6. As a developer, I want well-documented APIs, so I can integrate data efficiently and consistently.

MVP Features

The Minimum Viable Product (MVP) will focus on the following critical features:

- **Single Page Navigation**: Smooth routing without page reloads.
- **Dynamic Content Rendering**: Content fetched and displayed via APIs.
- **Responsive Design**: Optimized for mobile, tablet, and desktop.
- **Authentication & Authorization**: Secure login/logout, role-based access.
- **API Integration**: Real-time data retrieval and updates.
- **Error Handling & Notifications**: User-friendly error messages and alerts.
- **Basic Analytics Integration**: Track usage metrics for evaluation.

Wireframes / API Endpoint List

Wireframes (planned designs):

- **Landing Page**: Introduces the application with navigation options.
- **User Dashboard**: Displays personalized data and available services.
- **Admin Dashboard**: Tools for managing content, users, and analytics.
- **Login/Signup Pages**: Authentication screens with error validation.

Proposed API Endpoints:

- **GET /api/users** → Fetch list of users and profiles.
- **POST /api/login** → Authenticate user credentials.
- **GET /api/content** → Retrieve updated content for the SPA.
- **POST /api/content** → Add or update content dynamically.
- **GET /api/analytics** → Provide usage statistics and performance data.
- **DELETE /api/users/{id}** → Remove user accounts securely.

Acceptance Criteria

The SPA will be considered successful if the following criteria are met:

1. **Navigation**: Users can switch between sections without full page reloads.
2. **Responsiveness**: Works seamlessly on mobile, tablet, and desktop.
3. **Authentication**: Users can securely log in and log out.
4. **Dynamic Content**: Content updates occur in real-time via APIs.
5. **Security**: Role-based access is enforced for admin and user levels.
6. **Performance**: Page load and transitions must be under 2 seconds.
7. **Accessibility**: Meets WCAG 2.1 AA compliance standards.
8. **Scalability**: Architecture supports future feature expansions.
9. **Testing**: All MVP features pass unit, integration, and user acceptance tests.