

NewsHub Project Documentation

NewsHub - Modern News Aggregation Website

Final Project Report

Prepared By: SALMAN ALI
Submitted To: Miss IQRA Farooq
Subject: Web Engineering (CS221)
University: ILMA University

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Project Overview

NewsHub is a responsive, feature-rich news aggregation website that provides users with the latest news articles across various categories. The platform offers a modern, intuitive interface with advanced features such as real-time news tickers, article sliders, category filtering, search functionality, and responsive design that works seamlessly across all device sizes.

Features

Core Features

- News Article Aggregation**
 - Displays the latest news articles from various sources
 - Rich article cards with images, titles, descriptions, and metadata
 - Detailed article view with full content and additional information
- Featured News Slider**
 - Prominently showcases breaking/important news
 - Auto-scrolling carousel with navigation controls
 - Featured article badges for key stories
- Category Filtering**
 - Filter news by categories (technology, business, sports, entertainment, health, science)
 - Visual indicators for active category filters
 - Smooth transitions between category views
- Search Functionality**
 - Search across all articles by keywords
 - Responsive search UI for desktop and mobile
 - Category tag filters in mobile search view
- Responsive Design**
 - Fully responsive layout that adapts to all screen sizes

- Mobile-optimized interface with touch-friendly controls
- Adaptive content presentation based on device capabilities

6. Real-time News Ticker

- Scrolling ticker for breaking news and market updates
- Smooth animation with hover-pause functionality
- Designed for high visibility and quick information scanning

7. Pagination

- Navigate through multiple pages of news content
- Clear page indicators and navigation controls
- Maintains current category and search context during navigation

8. Article Detail View

- Comprehensive article view with full content
- Article metadata including source, date, and categories
- Sentiment analysis visualization for article tone (positive/neutral/negative)
- Related keywords/tags for article context

Technical Architecture

NewsHub is built using a modern front-end architecture with the following technologies:

- **HTML5** - Semantic markup for content structure
- **CSS3** - Advanced styling with CSS variables, flex/grid layouts, and animations
- **JavaScript (ES6+)** - Client-side functionality and API integration
- **RESTful API Integration** - Connection to the NewsHub API for fetching article data
- **Responsive Design** - Mobile-first approach using media queries and flexible layouts
- **Font Awesome Icons** - Visual elements and action indicators
- **Google Fonts** - Typography using Montserrat font family

The application follows a component-based structure with clear separation of concerns:

- **Content Rendering** - Dynamic article generation based on API data
- **State Management** - Tracking and managing application state (current page, category, search)
- **API Integration** - Authentication and data fetching from the NewsHub API
- **UI Interactions** - Event handling for user actions
- **Error Handling** - Graceful fallbacks and user feedback for failures

Project Structure

```
NewsHub/
├── index.html           # Main landing page
├── detail.html          # Article detail page
├── script.js           # Main JavaScript functionality
├── auth.js             # Authentication handling
├── slider.js           # News slider component
├── ticker.js           # News ticker component
├── detail.js           # Article detail page functionality
├── styles.css          # Global styles
├── slider.css          # Slider component styles
├── detail.css          # Article detail page styles
└── logo/               # Logo and favicon images
```

Implementation Details

News Card Component

Each news article is displayed as a card with consistent styling and interactive elements:

```

<div class="news-card">
  
  <div class="card-content">
    <span class="card-category"><i class="fas fa-microchip"></i> Technology</span>
    <h3 class="card-title">Article Title Goes Here</h3>
    <p class="card-desc">Article description text...</p>
    <div class="card-footer">
      <span class="card-date"><i class="far fa-calendar-alt"></i> Apr 10, 2025</span>
      <span class="card-source"><i class="far fa-newspaper"></i> Source Name</span>
    </div>
  </div>
</div>

```

The cards feature:

- Hover animations for enhanced user engagement
- Dynamic category icons based on article type
- Fallback images for missing article images
- Click interaction to navigate to detailed article view

News Slider Implementation

The slider component provides a focal point for featured articles:

```

class NewsSlider {
  constructor(containerId, options = {}) {
    // Initialize slider properties and elements
    this.container = document.getElementById(containerId);
    this.options = {
      autoplay: true,
      interval: 5000,
      pauseOnHover: true,
      ...options
    };

    // Set up slider elements and state
    this.init();

    // Slider methods for navigation, autoplay, and event handling
    // ...
  }
}

```

The slider includes:

- Auto-scrolling with configurable intervals
- Pause-on-hover functionality
- Dot indicators for current slide position
- Previous/next navigation controls
- Smooth transition animations

Search Functionality

Search is implemented with both desktop and mobile-optimized interfaces:

```
function performSearch(term) {
  if (!term || !term.trim()) {
    return;
  }

  searchTerm = term.trim();
  isSearchActive = true;

  // Update URL and UI for search state
  // ...

  // Fetch and render search results
  fetchNewsWithSearch(searchTerm);
}
```

The search system includes:

- URL parameter integration for shareable search results
- Visual feedback during search operations
- Clear search option to return to normal browsing
- Mobile-optimized search experience with filter tags

Authentication System

The application uses token-based authentication for API requests:

```
async function getAuthToken() {
  try {
    // Try to use the centralized auth module first
    if (window.auth && typeof window.auth.getToken === 'function') {
      return await window.auth.getToken();
    }

    // Fallback to permanent token if auth module unavailable
    const permanentToken = "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9...";
    return `Bearer ${permanentToken}`;
  } catch (error) {
    console.error("Failed to get authentication token:", error);
    throw error;
  }
}
```

API Integration

NewsHub connects to a RESTful API endpoint for article data:

```
const API_BASE_URL = "http://apps.maida.co:8013";
const API_URL = `${API_BASE_URL}/api/v1/articles/latest`;
```

API Endpoints

The application uses the following endpoints:

1. **Latest Articles:** GET `/api/v1/articles/latest`
 - Query parameters: `page`, `limit`, `category`, `search`
 - Returns paginated article data
2. **Article Detail:** GET `/api/v1/articles/{id}`
 - Returns detailed information for a specific article
3. **Authentication:** GET `/api/v1/auth/generate`
 - Provides authentication tokens for API access

Data Handling

The application processes and displays API data with robust error handling:

```
async function fetchNewsData(category = "", page = 1, limit = ITEMS_PER_PAGE) {
  try {
    // Authentication and API request
    // ...

    const data = await response.json();

    // Process and render news data
    renderNews(data);
    return data;
  } catch (error) {
    console.error("Error fetching news data:", error);

    // Fall back to sample data when API fails
    // ...
  }
}
```

Responsive Design

NewsHub implements a comprehensive responsive design approach:

CSS Variables for Consistent Styling

```
:root {
  --primary-color: #e63946;
  --primary-hover: #ff4d5e;
  --primary-dark: #c1121f;
  --text-color: #121212;
  --bg-color: #f1faee;
  --card-bg: #ffffff;
  --header-bg: #f8f9fa;
  --border-color: #ddd;
  --shadow-color: rgba(0, 0, 0, 0.1);
  --transition-speed: 0.3s;
  --border-radius: 12px;
}
```

Media Queries for Different Screen Sizes

```
@media (max-width: 768px) {
  .logo-img {
    max-height: 40px;
  }

  .news-grid {
    grid-template-columns: 1fr;
  }

  /* Mobile-specific adjustments */
  /* ... */
}

@media (max-width: 480px) {
  .slider-container {
    height: 350px;
  }

  .slider-content {
    padding: 1rem;
  }

  /* Small-screen specific adjustments */
  /* ... */
}
```

Mobile-Optimized Search Experience

The application provides a specialized search interface for mobile devices with an overlay design and category quick filters.

Performance Optimizations

NewsHub implements several performance optimizations:

- Optimized Asset Loading**
 - External resources loaded from CDNs
 - Deferred JavaScript loading for non-critical scripts
 - Efficient DOM Manipulation**
 - Use of document fragments for batch DOM updates
 - Throttled event handlers for scroll and resize events
 - Lazy Loading and Fallbacks**
 - Fallback data for API failures
 - Error handling for image loading with fallback images
 - Animation Performance**
 - CSS transitions and animations optimized for GPU acceleration
 - Minimal layout thrashing with transform/opacity animations
-

Error Handling

The application implements comprehensive error handling:

- API Request Failures**
 - Fallback to sample data when API requests fail
 - Detailed error logging for debugging
 - User-friendly error messages
- Resource Loading Errors**
 - Image loading error handling with fallbacks
 - Graceful degradation of features when resources are unavailable
- Authentication Failures**

- Token refresh mechanism for expired authentication
- Fallback authentication methods

Security Considerations

1. Authentication

- Token-based authentication for API requests
- Secure token storage practices

2. Data Handling

- Input sanitization for search terms and URL parameters
- Protection against XSS through proper HTML escaping

3. External Resources

- Trusted CDN sources for external libraries
- Content Security Policy considerations

Future Enhancements

Potential areas for future development:

1. User Accounts and Personalization

- User registration and login
- Saved articles and reading history
- Personalized news recommendations

2. Enhanced Content Features

- Comment system for articles
- Social media sharing integration
- Bookmarking functionality

3. Technical Improvements

- Progressive Web App (PWA) capabilities
- Offline mode support
- Advanced caching strategies

4. Analytics and Insights

- Enhanced sentiment analysis
- Reading time estimates
- Popularity indicators

Setup and Installation

To set up the NewsHub project locally:

1. Clone the repository:

```
git clone https://github.com/yourusername/newshub.git
cd newshub
```

2. Since this is a frontend-only project, you can serve it using any static file server:

```
# Using Python's built-in server
python -m http.server 8000

# Or using Node.js with http-server
npm install http-server
npx http-server
```

3. Access the website at `http://localhost:8000` in your browser

Usage Instructions

Browsing Articles

- The homepage displays the latest news articles in a grid layout
- Featured articles appear in the slider at the top of the page
- The breaking news ticker provides quick updates at the top of the screen

Filtering Content

- Click on category buttons to filter articles by topic
- Active category filters are highlighted
- Filter transitions include smooth animations for better user experience

Searching for Articles

- Click the search icon in the header to open the search interface
- Enter keywords and press Enter or click the search button
- Results will display with the search term and count highlighted
- Click "Clear search" to return to the regular article view

Reading Articles

- Click on any article card to view the full article details
- Article detail page includes:
 - Full article content
 - Publication date and source information
 - Category and related tags
 - Sentiment analysis (if available)
- Use the back button to return to the article listing

Mobile Navigation

- On mobile devices, tap the search icon for a full-screen search interface
- Use the category filters in the mobile search menu for quick filtering
- Responsive layout adapts to your device's screen size

Conclusion

The NewsHub project successfully implements a modern, responsive news aggregation website with rich features and robust error handling. The application demonstrates effective use of HTML5, CSS3, and JavaScript to create an engaging user experience across all device sizes.

The implementation follows best practices for web development, including component-based architecture, responsive design, and performance optimization. The project provides a solid foundation for future enhancements and can be extended with additional features as outlined in the future enhancements section.
