

Technical Report – Weather Explorer App

Design Decisions

We went for a tab-based navigation using Expo Router, as it keeps things tidy and familiar for users. The theme system is managed globally with React Context, so the whole app can switch between light, dark, or system in a flash. All weather data is fetched from OpenWeatherMap, and news comes from Google News RSS. The UI is designed to be clean, accessible, and responsive across devices.

API Integration: Challenges & Solutions

- **Challenge:** Handling API rate limits and errors from OpenWeatherMap.
Solution: We cache weather data for 10 minutes and show cached data if offline or if the API is down.
- **Challenge:** Parsing and displaying the 5-day forecast in a user-friendly way.
Solution: We group forecast data by day and show min/max temperatures and icons for each.
- **Challenge:** Geolocation permissions and errors.
Solution: We use expo-location and show a clear error if the user denies permission.
- **Challenge:** News RSS parsing and display.
Solution: We use rss2json to convert the Google News RSS feed into JSON, then display the articles in a tidy list.

State Management Approach

- We use React's useState and useEffect for local state.
- Search history and theme preference are persisted with AsyncStorage.
- The theme is managed globally with a custom context (ThemeContext.tsx), so the whole app updates instantly when you change it.

Reflections on the Development Process

Expo made cross-platform development grand, and React Native's hooks kept the code clean. Managing theme globally was a good call for consistency. Geolocation was easy with Expo, but always test on a real device! Caching and offline support are essential for a good user experience. We learned the importance of accessibility and responsive design for a broad user base.

Potential Future Improvements

- Add weather alerts and notifications
- Interactive weather maps
- Multiple saved locations
- Share weather info via social media
- Custom animations for different weather conditions
- More detailed accessibility features