



Hyperlocal Market Transformation: Enhancing Frontend Performance and User Experience

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Executive Summary

This case study explores how Atyantik Technologies enhanced the frontend performance and user experience of a hyperlocal marketplace platform. The client, a leading player in the hyperlocal market, required a robust frontend solution to manage thousands of products and shops while ensuring optimal performance on various mobile devices. Leveraging React with Server Side Rendering (SSR) and MobX State Tree (MST), Atyantik Technologies delivered a solution that significantly improved performance and user experience, particularly on low-memory mobile devices like iOS.

Problem Statement

The client, operating in the hyperlocal market, struggled with performance and user experience issues on their platform. Despite having a robust backend infrastructure built with Loopback.io and an admin dashboard using React-Admin, they faced challenges in handling thousands of products and shops. The client needed a frontend that could manage extensive data efficiently, optimize for various mobile devices, particularly low-memory iOS devices, and improve initial page load times and Time to Interactive (TTI) through SSR.

Solution Provided

To address these challenges, Atyantik Technologies developed a high-performing frontend solution using React with SSR and MobX State Tree for state management. Key features of the solution included:

- **React and SSR:** Enhancing performance by pre-rendering pages on the server, thus improving initial load times and SEO-friendliness.
- **MobX State Tree (MST):** Efficient state management to handle complex application states, ensuring predictable and reliable updates.
- **Robust Cart Management and Checkout Process:** Integration of advanced e-commerce functionalities, allowing users to buy from multiple shops and manage their carts seamlessly.

- **Optimized for Low-Memory Devices:** Implementation of techniques like offscreening components and optimizing code to reduce memory consumption, particularly for iOS devices.

Technical Architecture

The technical architecture of the solution included several critical components:

- **React:** A component-based JavaScript library used for building a modular and efficient user interface.
- **MobX State Tree (MST):** A state management library that simplifies handling complex application states.
- **ReactPWA with SSR:** A framework built on React that enables the creation of progressive web applications with server-side rendering capabilities.
- **Skeleton Loading:** Technique to enhance user experience by displaying a temporary UI structure while content is being loaded.

This architecture ensured that the frontend was scalable, performant, and capable of handling large datasets efficiently.

Challenges Faced

Several technical and operational challenges were addressed during implementation:

- **iOS Safari RAM Limitations:** Debugging and optimizing JavaScript bundles to prevent crashes.
- **Memory Leaks:** Managing memory consumption when displaying large numbers of products, particularly on low-memory devices.
- **Performance Optimization:** Ensuring quick interactivity and reducing initial paint times through SSR.

Atyantik Technologies overcame these challenges through advanced debugging, code optimization, and efficient state management techniques.

Results

The implementation of the solution led to significant improvements:

- **Enhanced Performance:** Faster initial load times and improved Time to Interactive (TTI) through SSR.
- **Optimized User Experience:** Smooth and engaging UI, even on low-memory devices.
- **Scalability:** The frontend could efficiently handle thousands of products and shops.
- **Client Success:** The client successfully onboarded over 1,000 shops and expanded to more than four cities in Europe.

Conclusion

Atyantik Technologies successfully transformed the client's hyperlocal marketplace platform by delivering a powerful and performant frontend solution. This case study highlights the company's expertise in frontend development and their commitment to enhancing user experiences in the hyperlocal market. The collaboration resulted in a scalable, user-friendly, and high-performing platform, setting a benchmark for future projects in similar domains.