

A photograph of two surgeons in an operating room, wearing blue scrubs and surgical masks, looking down at a patient. A large, circular surgical light fixture is visible in the background, casting a bright blue glow. The image is partially obscured by a dark red diagonal overlay at the bottom.

Cross-Platform React Native Re-Architecture for a Major Healthcare Mobile Portal

Unifying legacy iOS and Android infrastructures into a high-security, dynamic React Native portal featuring Remote Config navigation and zero on-device PII/PHI storage.

Overview

We executed a complete re-architecture of the enterprise mobile portal using React Native, establishing a single shared cross-platform codebase.

- Integrated enterprise Entra ID SSO paired with Duo Security multi-factor authentication (2FA) and native biometric enclaves for streamlined, high-security login flows.
- Enabled dynamic, runtime-driven content and menu injection via Firebase Remote Config and SharePoint APIs, completely removing app store dependency for editorial updates.
- Maintained continuous, 24x7 operational availability under a Tier 1 SLA, delivering more than 10 stable production releases over three years with zero critical security incidents.



Client Profile

This premier New York City academic health system supports thousands of active nurses, physicians, and patient relations coordinators. Their established IT ecosystem relies on strict, proprietary mobile frameworks for underlying data orchestration, network connectivity, and keychain management—demanding that any new digital asset integrate natively within their security architecture.

Challenges: Dual-Codebase Overhead and Rigid App Deployments

Maintaining separate mobile architectures compromised feature delivery velocity and exposed the client to operational vulnerabilities:

- **Compounded Engineering Effort:** Supporting separate native iOS and Android codebases doubled development time and split debugging focus across two unique tech stacks.
- **App Store Content Bottlenecks:** Hard-coded navigation paths meant simple changes to links or layout structures required a full app store submission and review cycle, delaying editorial teams by weeks.
- **Authentication Gaps:** Legacy deployments lacked robust, uniform integrations for modern enterprise Single Sign-On (SSO), multi-factor challenges, and biometric device parameters.
- **Zero-Observability Blind Spots:** A lack of centralized telemetry, crash tracking, or engagement mapping made it difficult for product managers to intelligently prioritize application improvements.
- **Strict Regulated Data Protection:** Healthcare data governance rules required proof that zero Protected Health Information (PHI) or Personally Identifiable Information (PII) was cached or saved locally on the device hardware.
- **Mission-Critical Uptime Demands:** Classified as a Tier 1 application, the portal demanded continuous availability, requiring a flawless migration framework with zero downtime.

Solution: Secure Cross-Platform Portal Architecture

We designed and engineered a unified, enterprise-grade React Native architecture. The platform combines a native authentication shell with a purpose-built, SharePoint-integrated WebView subsystem. This custom engine injects JavaScript, registers unique user agents, and intercepts new window parameters to wrap a massive corporate intranet cleanly inside an agile native interface.

The system modernization spans four specialized operational frameworks:

1. Hardened Enterprise Authentication Mesh

Initial validation routes users through an OAuth 2.0/Microsoft Entra ID flow secured by a mandatory Duo Security 2FA prompt, managing session cookies natively across all backend services. For secondary access, the application integrates iOS Keychain and Android Keystore APIs to support fast, hardware-backed biometric login (Face ID, Touch ID, Fingerprint).

2. Runtime Dynamic Navigation

To liberate content coordinators from app store release delays, we mapped all navigation structures, quick links, and catalog nodes to pull dynamically at runtime. The system targets custom SharePoint endpoints and Firebase Remote Config layers, allowing administrators to modify application architecture and push fresh links instantly.

3. Abstracted Multi-Destination Telemetry

We built a normalized AnalyticsManager abstraction layer to centralize system tracking safely. This component maps user interaction events, screen views, and stability variables concurrently to three downstream analytical targets—Firebase Analytics, Segment, and Mixpanel—without degrading application rendering speed.

4. Continuous Deployment Pipeline

We established a strict multi-environment architecture (Dev, Staging, Beta, Production) using isolated application IDs and distinct database endpoints. Integrated GitHub Actions CI/CD pipelines automate builds across eight distinct release targets, compiling and dispatching packages to TestFlight, Google Play Console, and Firebase App Distribution simultaneously.

Key Features and Technical Highlights

- **Single Cross-Platform Codebase:** Built on React Native to guarantee feature parity across iOS and Android while cutting operational maintenance costs in half.
- **Zero-On-Device Storage Enforcement:** Rigorous interceptors clear system buffers instantly, ensuring no PII or PHI records touch the local disk cache.

- **App Lifecycle-Aware Session Control:** Automatic session-timeout triggers monitor device sleep and wake states, locking the interface when it is left unattended on a clinical floor.
- **Hard Force-Update Engine:** On-launch version validation handshakes verify client compatibility against production servers, blocking outdated or compromised builds from connecting.
- **Modernized OS Target Alignments:** Maintained long-term store compliance by verifying stability across Android 15 configurations and setting an iOS 15.1 baseline.

Impact

- **Eliminated Dual-Maintenance Overhead:** Transitioning to a single cross-platform layout freed up internal development bandwidth and cut time-to-market for new internal modules.
- **Slashed Editorial Latency:** Moving navigation data to Remote Config reduced the time required to update corporate resources from weeks to hours, removing app store review delays.
- **Accelerated Staff Workflows:** Introducing secure biometric bypass controls drastically decreased daily authentication friction for thousands of on-floor clinical and administrative staff.
- **Flawless Operational Continuity:** Maintained a 24x7 operational posture over three years of active development, shipping 10+ major iterations without a single critical security incident.
- **Absolute Compliance Assurances:** Comprehensive data-flow audits confirmed complete isolation of sensitive records, guaranteeing zero local storage of PII or PHI.
- **Deep Product Visibility:** Unified analytics pipelines provided product managers with immediate visibility into features adoption and stability issues, driving data-backed upgrade priorities.