



Thapovan
Info Systems Inc.
Intense Pursuit of Knowledge

**Your Dedicated IT Solution Partner in
US ✦ India ✦ Europe ✦ Middle-East**

**EMPOWERING HEALTHCARE
REIMBURSEMENT FOR
PATIENTS AND PRACTITIONERS**

Case Study



New Jersey - Chennai - Palakkad



+91-9150049548



bd@thapovan-inc.com



www.thapovan-inc.com



The Client

The client, a team led by a prominent U.S. psychiatrist and an experienced product director, brings together a powerful blend of medical insight and product development expertise to solve the challenges of out-of-network medical claims. Their priorities focus on creating an intuitive, streamlined claims experience that enables users to easily manage and file claims on mobile devices with just a few clicks. To ensure user trust and data protection, the client prioritizes full HIPAA compliance, safeguarding sensitive healthcare information. This client-driven solution not only addresses a major pain point in the healthcare and insurance landscape but also delivers enhanced accessibility, convenience, and security, reflecting the client's dedication to a user-centered and efficient claims process.

The Business Challenge

The client encountered several key challenges in transforming the out-of-network claims process for users and their dependents:

- **Complex, Time-Consuming Claims Process:** Traditional claim submissions were manual, error-prone, and often delayed, leading to user frustration and slow reimbursement.
- **Need for User-Friendly, Mobile Solution:** Users required a simple, convenient way to file claims directly from their mobile devices, ensuring ease of access and engagement.
- **Ensuring Accurate, Complete Claims Submission:** The process needed to guide users through inputting essential details (e.g., insurance info, CPT codes) to reduce errors and expedite processing.
- **Efficient Backend Workflow for Claims Processing:** The client sought automation for claim categorization, processing, and insurer routing to minimize manual intervention and improve processing speed.
- **Real-Time Claim Status Updates:** Users required transparency in the claims journey, with real-time status updates to build trust and provide peace of mind.



- **Integration of Secure, Modern Mobile Features:** The app needed secure access (e.g., Touch ID login) and seamless payment options (e.g., Apple Pay) to meet user expectations and enhance convenience on iOS and Android.

These challenges highlighted the need for a robust, automated solution that would streamline claims processing, improve user satisfaction, and reduce administrative overhead.

The Engagement



Following a thorough evaluation of technical capabilities, the client chose Thapovan as its primary technology partner, recognizing our proven expertise in delivering scalable and robust technology solutions. Thapovan provides end-to-end services across the client's product ecosystem, encompassing mobile and web development as well as backend infrastructure to ensure seamless integration across all platforms.

Key Activities in the Engagement:

- **Offshore Development Model:** Implemented an efficient offshore development approach for effective project execution.
- **Requirements Gathering:** Conducted comprehensive collection of business requirements and technical specifications to align development with client objectives.
- **Core Application Design and Development:** Focused on building robust applications and essential modules tailored to client needs.
- **Collaboration with Client Team:** Fostered seamless interaction with the client's product team to ensure smooth integration and alignment on project progress.
- **Performance Optimization:** Performed analysis, benchmarking, and solution identification to enhance application performance.
- **Feature Development:** Designed and implemented new features to expand application capabilities.
- **Quality Assurance Management:** Managed both project-based and routine quality assurance to deliver consistent, high-quality results.
- **Ongoing Maintenance and Change Management:** Provided continuous maintenance and handled change requests to ensure sustained application functionality.



To meet the client's anticipated user growth and complex backend processing requirements, Thapovan designed a multi-layered, scalable architecture. This architecture facilitates high concurrency, efficient resource management, and secure data handling, establishing a robust foundation for a high-performance application that can scale with user demand.

Key Aspects of the Engagement

- **Mobile Applications:** Thapovan developed native Android and iOS applications using Java and Swift, leveraging platform-specific features to optimize performance and deliver a responsive user experience where user can file their own claims using this application.
- **Practitioner Application:** A cloud-based interface for managing out-of-network patients and their insurance claims. The front-end was developed using React.js for a dynamic user interface, while the backend is powered by Node.js and MySQL, ensuring high availability and performance for managing patient records and claims.
- **Administration Application:** Built with PHP-Phalcon for effective management of administrative workflows, this application is deployed via AWS Elastic Load Balancing (ELB) for scalability and high availability.
- **Claims Management:** Single-Page Applications (SPAs) developed using AngularJS facilitate quick claim processing with minimal page load times, perfect for handling high-volume data entries.
- **JavaScript Widget:** A JavaScript-based widget was created for easy integration into external websites, allowing users to access services seamlessly in any online environment.
- **EHR and Practice Management Integration:** Integrated with third-party applications to capture and generate claims from their systems, streamlining the processing workflow.
- **Real-time verification of benefits (VOB):** Allows patients know how much reimbursement they can expect to receive for the services provided by practitioners, including what their out-of-network deductible is and how much is remaining in their plan.



Through this partnership, Thapovan has delivered a comprehensive and resilient technology solution, enabling the client to concentrate on strategic growth and enhancing user engagement without worrying about system performance or scalability.

The Technology



Initially, the application was built using PHP frameworks and a MySQL database within a monolithic architecture. However, as technology advanced, Thapovan modernized the system by adopting a microservices architecture and migrating to Node.js and React.js. This transformation enhanced scalability, performance, and flexibility, enabling independent service deployment and improved platform compatibility. It also allowed integration with modern cloud technologies like Docker.

Thapovan's role was to assess and implement the most suitable technologies across various applications to meet the client's performance, cost, and usability goals.

Major Technology Components:

Languages:	Node.js (18), Java, PHP, Swift
Web Server:	Nginx
Database:	MySQL 8
Caching:	Redis
Architecture:	Microservices
Backend Frameworks:	Node.js, PHP
Frontend Frameworks:	React.js, AngularJS, HTML, CSS, JavaScript
Cloud:	AWS Cloud, Docker, Elastic Beanstalk, ECS
Monitoring:	CloudWatch
Alerting:	Slack
CI/CD:	GitLab Runner (Docker & SSH)
E2E Automation:	Selenium, Java
Code Quality:	SonarQube
Unit Testing:	Jest



Key Technical Tools Utilized:

- **Redis Cache** - Provides fast, in-memory caching for improved data retrieval speed and system performance.
- **JSON** - Enables lightweight, structured data interchange.
- **AWS SNS** - Facilitates messaging and notifications for inter-service communication.
- **AWS RDS** - Manages relational databases for secure, scalable cloud storage.
- **AWS Cognito** - Supports secure user authentication and identity management.
- **Mandrill** - API for transactional email notifications.
- **AWS S3 Bucket** - Offers durable and highly available data storage.
- **RabbitMQ** - A message broker for asynchronous, efficient inter-service communication.

The Result



With this solution, the client achieved significant milestones:

- **Streamlined Claims Process:** Simplified the traditionally complex and time-consuming claims submission, reducing user frustration and expediting reimbursement.
- **User-Friendly Mobile Applications:** Developed intuitive Android and iOS apps, allowing users to file claims easily with just a few clicks from their mobile devices.
- **Accurate Claims Submission:** Implemented guided workflows to ensure users input essential information correctly, leading to more accurate and complete claims submissions.
- **Efficient Backend Automation:** Automated the claim categorization, processing, and routing to insurers, minimizing manual intervention and significantly improving processing speed.
- **Real-Time Claim Status Updates:** Provided users with transparent, real-time updates on their claims, enhancing trust and providing peace of mind throughout the claims journey.
- **Enhanced Security and Compliance:** Achieved full HIPAA compliance to protect sensitive healthcare information, ensuring user trust and data security.



EMPOWERING HEALTHCARE REIMBURSEMENT FOR PATIENTS AND PRACTITIONERS

Case Study

- **Increased User Engagement:** Improved accessibility and convenience led to higher customer adoption rates and user base growth.
- **Faster Time to Market:** The collaborative development approach allowed for quicker delivery of features and improvements, enhancing the overall product offering.
- **Optimized Performance and Scalability:** Designed a robust, multi-layered architecture that supports high concurrency and efficient resource management, ready to scale with user demand.

Overall, the partnership enabled the client to focus on strategic growth and enhance user engagement while relying on a resilient and high-performance technology solution.