

## Project Summary

Post-acute care facilities working with SYResp struggled with fragmented respiratory care delivery, limited access to qualified respiratory therapists, slow and manual equipment procurement, and uncoordinated diagnostic services. These gaps delayed treatment, increased administrative workload, and contributed to avoidable hospital readmissions.

smartData built a unified, workflow-driven respiratory care platform that brought together therapist staffing, equipment ordering and rentals, and diagnostic testing into a single system. Facilities could schedule therapists on demand, procure ventilators and PAP devices through a centralized interface, and coordinate diagnostics like PFTs, spirometry, and sleep studies with faster turnaround. Realtime tracking and reporting replaced manual, vendor-dependent processes.

As a result, facilities accelerated treatment initiation, reduced equipment and diagnostic turnaround times, and improved therapist utilization. This enabled more coordinated, timely care delivery, leading to reduced readmissions, better patient outcomes, and measurable gains in operational efficiency across post-acute care centres.

### Problem Statement

Post-acute care facilities relying on SYResp faced fragmented respiratory care workflows, with staffing, equipment procurement, and diagnostics managed through separate channels. Facilities struggled to source qualified respiratory therapists on time, leading to care delays and coverage gaps. Equipment ordering was manual and vendor-dependent, causing 30–40% longer turnaround times for critical devices like ventilators and PAP units. Diagnostic services such as PFTs and sleep studies were uncoordinated, often delaying results by 24–72 hours. These inefficiencies increased administrative workload, slowed treatment initiation, and contributed to higher hospital readmission rates. The client needed a unified, scalable system to streamline operations, reduce delays, and enable faster, more coordinated respiratory care delivery

## Approach / Solution

smartData built a fully custom, cloud-based respiratory care platform to unify staffing, equipment, and diagnostics into a single system. A modular microservices architecture was used to keep each function independent while enabling seamless integration through secure APIs. Agile methodology ensured rapid iterations, continuous feedback, and alignment with real clinical workflows. A centralized dashboard provided real-time visibility into therapist availability, equipment orders, and diagnostic status. Role-based access and secure data handling ensured HIPAA compliance. The solution was entirely bespoke, with no pre-built smartData pods or platforms used.

### Technical Challenges

#### - Challenges

- ★ Integrating fragmented workflows for staffing, equipment, and diagnostics across multiple vendors and systems without data silos.
- ★ Ensuring real-time visibility into therapist availability, equipment status, and diagnostic progress across facilities.
- ★ Making voice verification reliable while maintaining HIPAA-compliant data security while handling sensitive patient and operational data across modules, able in noisy real-world conditions.

#### - How We Solved It

- ★ Designed a microservices-based architecture with unified APIs to enable seamless data exchange and centralized workflow orchestration.
- ★ Implemented event-driven architecture with realtime sync and a centralized dashboard for live tracking and status updates.
- ★ Applied role-based access control, encrypted data storage/transmission, and audit logging to ensure end-to-end compliance.

## Learning

Early stakeholder alignment on clinical workflows is critical, initial gaps led to rework in scheduling and diagnostic flows. Modular architecture worked well, but clearer API contracts upfront would have reduced integration iterations. Real-time features added complexity; future pods should plan event-driven design from day one. Strong domain understanding of post-acute care significantly improved delivery, invest more time early in healthcare workflow mapping.

## Screenshots

