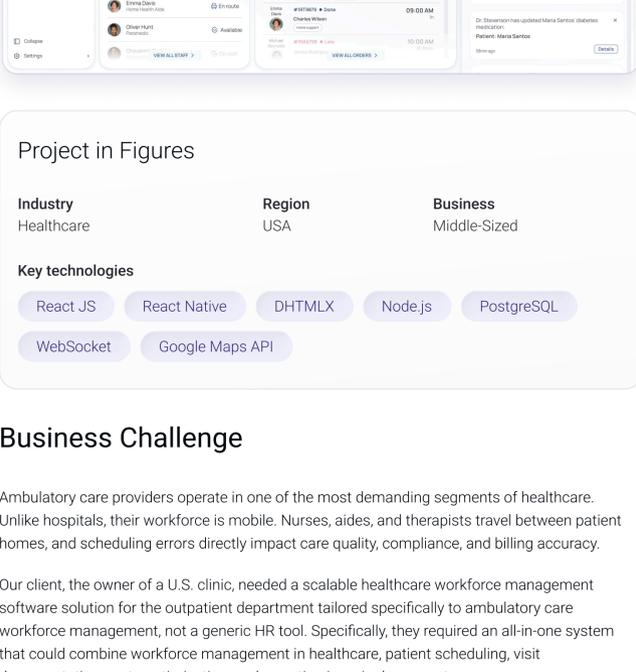


## Healthcare Workforce Management Software for Ambulatory Care

Comprehensive SaaS-based healthcare workforce management system designed for ambulatory care service providers. It streamlines visit scheduling and tracking, employee coordination, and patient data flows while ensuring compliance and real-time operational visibility.



### Project in Figures

**Industry:** Healthcare  
**Region:** USA  
**Business:** Middle-Sized

#### Key technologies

React JS, React Native, DHTMLX, Node.js, PostgreSQL, WebSocket, Google Maps API

## Business Challenge

Ambulatory care providers operate in one of the most demanding segments of healthcare. Unlike hospitals, their workforce is mobile. Nurses, aides, and therapists travel between patient homes, and scheduling errors directly impact care quality, compliance, and billing accuracy.

Our client, the owner of a U.S. clinic, needed a scalable healthcare workforce management software solution for the outpatient department tailored specifically to ambulatory care workforce management, not a generic HR tool. Specifically, they required an all-in-one system that could combine workforce management in healthcare, patient scheduling, visit documentation, route optimization, and reporting in a single ecosystem.

Their existing tools were fragmented: spreadsheets for staffing, a basic patient management system, manual route planning, and paper-based visit confirmations. This led to billing delays, compliance risks, and inefficient staff allocation.

**Limited workforce visibility:** Ambulatory care coordinators lacked a centralized healthcare workforce management system to see staffing capacity, availability, and workload distribution in real time.

**Manual scheduling processes:** Visit planning and re-assignments were handled manually, increasing the risk of missed appointments, delays, and administrative overhead.

**No real-time field verification:** The organization had no GPS-based confirmation of employee arrivals, visit durations, or route efficiency, reducing operational transparency.

**Disconnected patient and workforce systems:** Patient records and workforce scheduling tools operated separately, preventing seamless data flow and creating billing and compliance risks.

## Solution

We developed a modular [workforce management software](#) for administrators, schedulers/dispatchers, medical care field employees (nurses, aides, therapists, paramedics, etc.) of healthcare organizations delivering ambulatory services.

The platform combines [Patient Management Software](#), Care Coordination Software, and advanced Ambulatory Care Workforce Management tools. It connects long-term planning with real-time dispatch operations, supported by a mobile application and live map tracking.

The system was built as a configurable healthcare workforce management solution designed to adapt to various ambulatory care models – from home health services to outpatient clinical programs.

**Configurable provider administration** displaying matchable patient and employee competencies.

**Automated order planning and scheduling** for long-term recurring care assignments.

**Comprehensive dashboard with timeline and proactive alerts** for operational adjustments and exception management.

**Real-time monitoring with live map** to review route optimization, order statuses, and staff activity.

**Native mobile app** for field visit execution and offline documentation.

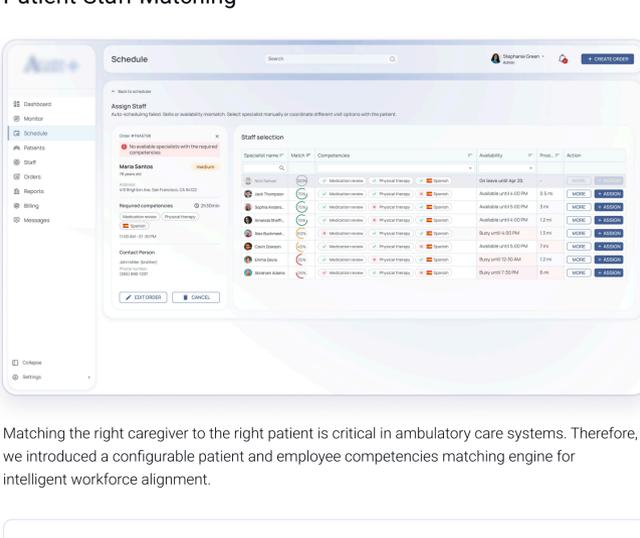
**Advanced reporting** and export engine for billing and compliance.

“It was important to translate fragmented, paper-driven workflows into a single healthcare workforce management system without disrupting daily ambulatory operations. We had to account for real-time schedule changes, compliance requirements, GPS verification, and mobile documentation – all while ensuring the platform remained intuitive for dispatchers and field nurses.”

**Sergey Filatov**

Project Manager at XB Software

## Operational Hub with Map



Ambulatory operations change hourly. Employees call in sick, urgent visits appear, the current ones may require rescheduling, or traffic delays occur. We built an operational hub combining a timeline-based dispatch board with a synchronized geographic live map.

### Real-Time GPS Monitoring

The mobile device with the installed application acts as a GPS transmitter. It continuously sends the device's geographic coordinates to the server, ensuring near real-time location accuracy. Employees appear as live icons on the map, and status changes dynamically (en route, on-site, late, etc.).

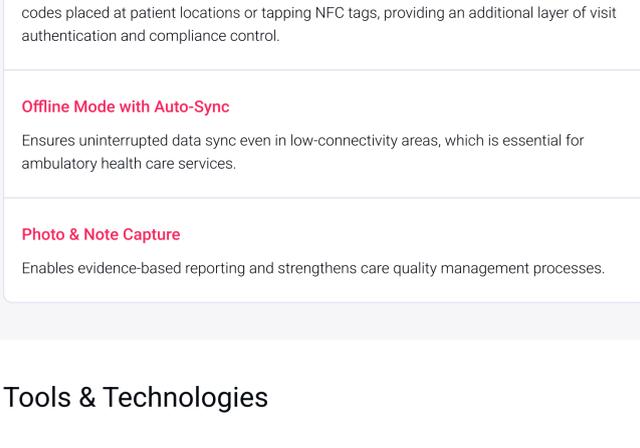
### Route Optimization Engine

Dispatchers can optimize multiple visits at once, reducing travel time and improving efficiency – a major benefit of modern healthcare workforce management systems.

### Proactive Alerts

Late arrival warnings, route deviation alerts, and missed or urgent visit detection enhance operational transparency and service quality.

## Order Planning & Scheduling Board



To manage both recurring, new, and urgent visits efficiently, ambulatory care providers need more than daily scheduling. We implemented a long-term planning board that establishes the baseline workload for weeks and months ahead – the backbone of effective ambulatory workforce management.

### Employee-Centric Timeline View

Displays assigned care orders as continuous ribbons across employee rows. Instead of fragmented visits, schedulers see the full long-term commitment for caregiver.

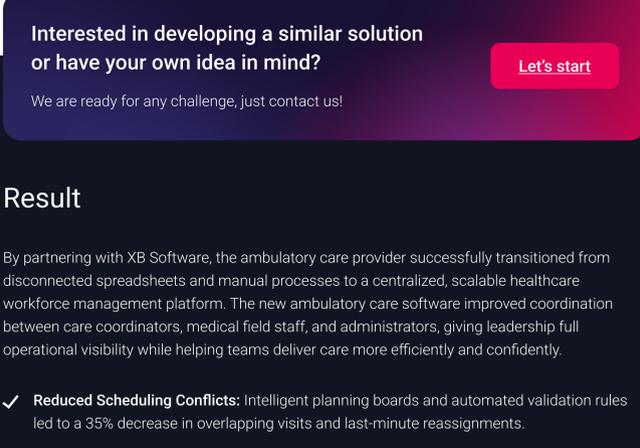
### Drag-and-Drop Assignment Logic

Work orders can be assigned or re-assigned between caregivers via simple drag-and-drop. Capacity warnings alert managers if workloads exceed contracted hours.

### Version-Controlled Schedule Updates

When care plans change, the system creates a new schedule version without corrupting historical data – critical for compliance in ambulatory care management.

## Patient-Staff Matching



Matching the right caregiver to the right patient is critical in ambulatory care systems. Therefore, we introduced a configurable patient and employee competencies matching engine for intelligent workforce alignment.

### Smart Matching Logic

Each order contains details that should be considered for the best patient-specialist match. The system automatically suggests suitable staff based on required patient needs, order details (communication language, diagnosis, fall risk, living situation, etc.), and specialists' competencies.

### Manual Assignment for Mismatches

If automated matching fails, the system offers manual assignment and provides orders to the 'Unassigned order' category. The administrator can check which factors mismatch and contact the employee or patient to offer the best option.

## Mobile App for Staff



Medical field employees require a lightweight yet powerful tool for visit execution. We developed a [native mobile application](#) supporting secure login, offline functionality, structured task documentation, and on-site verification via GPS, NFC tags, or QR codes.

### Visit Start/End with GPS Verification

Automatic timestamping and location capture improve billing accuracy and audit readiness. In addition to GPS validation, caregivers can confirm arrival and departure by scanning QR codes placed at patient locations or tapping NFC tags, providing an additional layer of visit authentication and compliance control.

### Offline Mode with Auto-Sync

Ensures uninterrupted data sync even in low-connectivity areas, which is essential for ambulatory health care services.

### Photo & Note Capture

Enables evidence-based reporting and strengthens care quality management processes.

## Tools & Technologies

To deliver a healthcare workforce management system for ambulatory practice capable of supporting mobile teams, real-time data updates, and compliance-heavy workflows, we needed an architecture that could handle *constant data updates without compromising stability*. Ambulatory care operations change by the minute (visits get reassigned, routes shift, patients' history updates in real time), so performance and synchronization were critical from day one.

We built the frontend using [React.js](#) and React Native, which gave us the flexibility to create highly dynamic planning boards and responsive dashboards. However, building complex scheduling logic entirely from scratch would have significantly extended development time. To accelerate delivery while maintaining enterprise-grade functionality, we integrated [DHTMLX components](#), particularly [DHTMLX Scheduler](#) for timeline-based planning and long-term workload visualization.

Because dispatch decisions depend on live field data, we implemented **WebSocket connections** to enable instant updates across the system. When a caregiver changes status in the mobile app, the planning board and map view update immediately – no manual refresh required.

On the backend, we used **Node.js with a modular NestJS architecture** to ensure scalability and clean service separation. This allowed us to handle scheduling logic, GPS tracking, audit logging, and reporting as independent yet synchronized modules. Structured workforce and patient data were stored in **PostgreSQL**, ensuring consistency, relational integrity, and reliable reporting.

Access control was another critical layer. Since ambulatory care organizations operate with multiple roles (administrators, dispatchers, nurses, auditors), we implemented granular **Role-Based Access Control (RBAC)** to ensure users only see and modify what aligns with their responsibilities.

For route planning and real-time field visibility, we integrated the **Google Maps Platform API**, as well as **Mapbox** and **MazeMap** to enhance mapping flexibility across different operational scenarios. This enabled geocoding, ETA calculation, route optimization, indoor and outdoor navigation support, and live GPS tracking directly inside the operational dashboard. By combining these mapping technologies, dispatchers can instantly detect delays, optimize multi-stop routes, visualize complex facility layouts when needed, and respond proactively to schedule disruptions with greater geographic precision.

By combining React's flexibility, DHTMLX's ready-to-use scheduling power, real-time WebSocket communication, and a scalable Node.js backend, we delivered a responsive, future-proof ambulatory care workforce management platform – capable of supporting both strategic workforce planning and real-time field execution within a single ecosystem.

**Interested in developing a similar solution or have your own idea in mind?**

We are ready for any challenge, just contact us!

[Let's start](#)

## Result

By partnering with XB Software, the ambulatory care provider successfully transitioned from disconnected spreadsheets and manual processes to a centralized, scalable healthcare workforce management platform. The new ambulatory care software improved coordination between care coordinators, medical field staff, and administrators, giving leadership full operational visibility while helping teams deliver care more efficiently and confidently.

- ✓ **Reduced Scheduling Conflicts:** Intelligent planning boards and automated validation rules led to a 35% decrease in overlapping visits and last-minute reassignments.
- ✓ **Optimized Field Operations:** Integrated route optimization and live map tracking reduced travel inefficiencies by 28%, allowing caregivers to spend more time with patients instead of on the road.
- ✓ **Faster Reporting & Billing:** Mobile visit execution with GPS-verified timestamps accelerated data management by 40% and significantly improved billing accuracy.
- ✓ **Full Operational Visibility:** Real-time dashboards provided coordinators and managers with instant insight into workloads, visit statuses, and field performance across all ambulatory teams.
- ✓ **Stronger Compliance Control:** Automated competency matching and detailed audit logs minimized regulatory risks and simplified internal and external audits.

**Your questions and requests are always welcome!**

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