



Transforming Mobile Health with Machine Learning & Generative AI

A Massachusetts-based mobile healthcare provider engaged Techlogix to build a next-generation digital platform designed to simplify operations, strengthen security, and accelerate decision-making. The goal was to transform the care experience for both patients and healthcare professionals.

The platform harnesses the power of Machine Learning and Generative AI to support frontline medical staff in critical tasks such as performing patient triage, identifying emergencies, and allocating the right resources for timely, in-home care.

At the core of the solution are two intelligent AI Agents:

- Triage Agent – Assesses patient symptoms and history to provide actionable recommendations to medical staff.
- Service Delivery Agent – Matches patient needs with the right service vehicle and team by factoring in availability, location, and urgency. It then updates all key stakeholders - paramedics, staff, patients and physicians - to ensure seamless coordination and faster response times.

Customer
Urgent Medical Care Provider

Industry
Healthcare

Offering
Data Analytics and AI

About the Client

Our client is a Massachusetts based Mobile Integrated Healthcare provider that delivers urgent medical care in the comfort and safety of a patient's home, avoiding unnecessary and expensive visits to the Emergency Department and the Inpatient Hospital admissions that may follow.

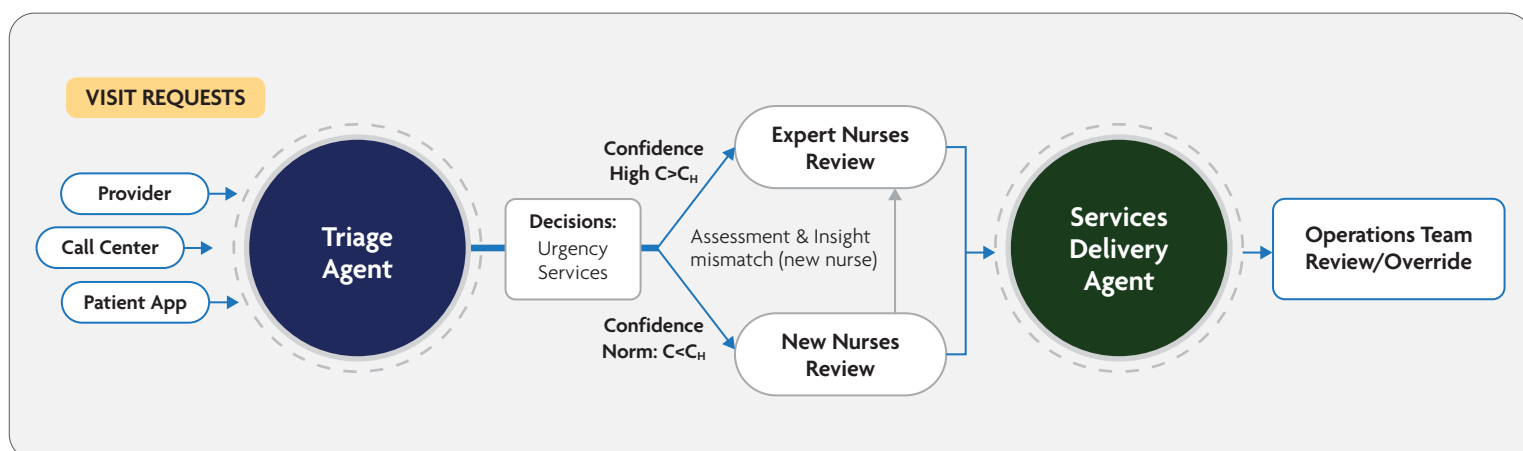
The Challenge

Like many organizations in the healthcare industry, the customer faced a significant nursing staff shortage, particularly in the aftermath of COVID-19. With experienced nurses retiring early and the growing demand for in-home care, the need for a cutting-edge business platform became critical. This platform required embedded machine learning solutions to enhance healthcare decision-making and effectively allocate paramedics. Additionally, the urgent care business experiences strong seasonal variability in visit volumes. Accurate projection systems were essential to optimize staffing and paramedic van resources to handle these fluctuations effectively.

The Solution

Techlogix developed a robust suite of machine learning solutions to address these challenges:

- **Triage Agent:** An Agent based on multiple machine learning algorithms, including Gradient Descent classifiers and multi-factor correlations, supports nurses in making quick, confident decisions about whether a patient requires emergency room care, paramedic attention, or routine follow-ups. The Agent provides a confidence measure and reasoning of its recommendations to assist medical staff in making informed decisions. Additionally, a Generative AI module creates detailed visit notes based on nurse inputs, streamlining communication with doctors and paramedics during in-home visits.
- **Volume Projection Algorithm:** Leveraging Meta Prophet at its core, this algorithm provides highly accurate daily and monthly visit volume forecasts by analyzing historical data, periodic patterns, and weekend/holiday effects.
- **Staffing and Scheduling Optimization:** Volume projections are correlated with staff attendance data to generate new staffing schedules. This ensures optimal staff availability while integrating paramedic scheduling and inventory management for better operational planning.
- **Services Delivery Agent:** An Agent analyzes Patient needs, services availability on paramedic vehicles, geographic locations of patients and vehicles, and paramedic schedule to assign paramedic service vehicles automatically. The Agent performance is reviewed periodically to ensure optimum assignments and identify any Agent retraining or re-modeling.
- **Route Optimization and Geo-Tracking:** Smart route planning ensures efficient use of paramedic trucks, while geo-tracking provides frequent updates to patients via a mobile app, enhancing transparency and service satisfaction.
- **Smart Alerts:** Real-time health condition indicators, visit volumes, and inventory levels trigger alerts to improve response times and care quality.
- **User-Friendly Dashboards:** Elegant dashboards provide actionable insights tailored to the needs of key users, ensuring informed decision-making at all levels.

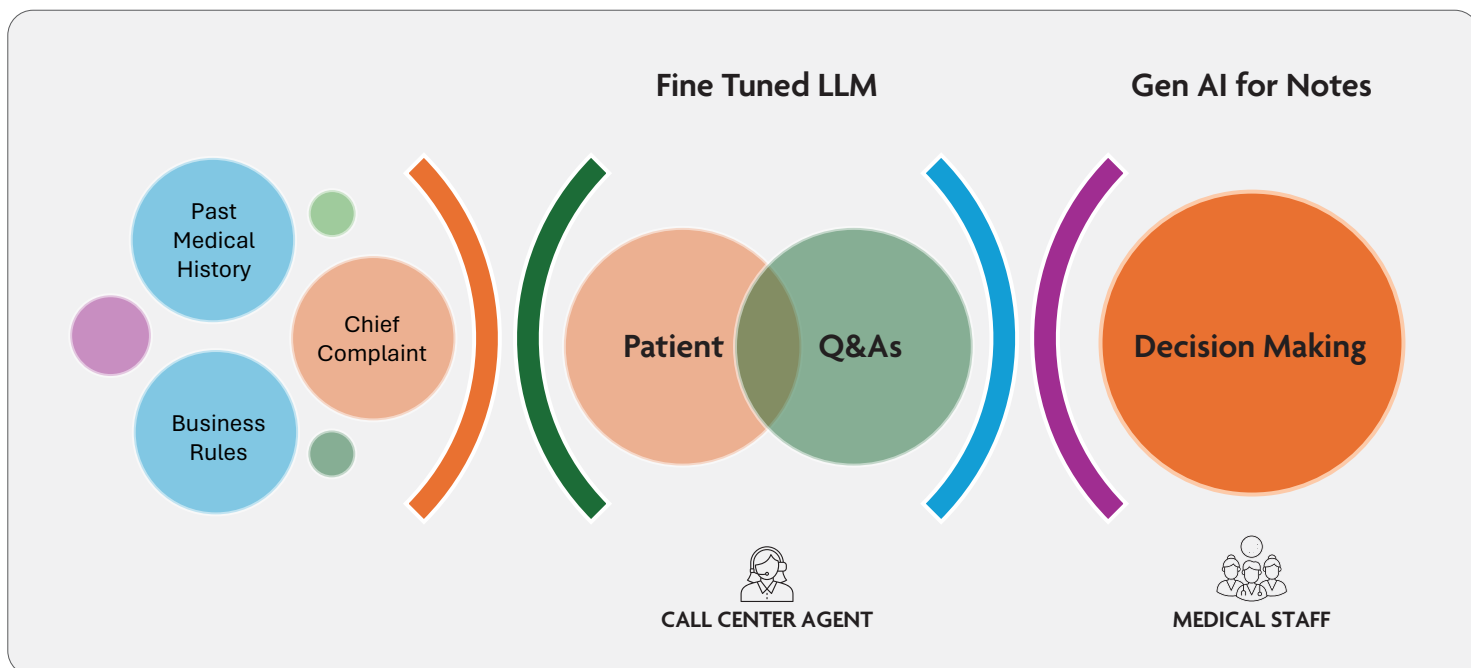


The Technology

The machine learning models are integrated into the platform, built on an advanced microservices architecture hosted on Microsoft Azure. The models operate in compute containers, using entry scripts to process JSON-formatted inputs and YAML files for configuration. Outputs are logged into a relational data store for auditing and analysis. Azure Event Grid and Azure Data Factory facilitate seamless data flow, moving data from the production MongoDB to the relational data store and triggering ML model execution. This architecture enables efficient data processing, robust model execution, and seamless integration with the healthcare platform.

Key Benefits

1. **Improved Decision-Making:** The intelligent triage system and Generative AI modules provide actionable insights with confidence measures, enabling faster, data-driven decisions.
2. **Enhanced Resource Utilization:** Smart resource assignment and route optimization ensure efficient use of paramedics, trucks, and inventory, reducing costs and response times.
3. **Operational Efficiency:** Accurate volume projections and optimized staffing schedules help the organization handle seasonal variability effectively while maintaining high-quality care.
4. **Better Patient Experience:** Real-time updates, smart alerts, and seamless communication improve service transparency, speed, and overall patient satisfaction.
5. **Scalable and Secure Platform:** The Azure-based microservices architecture ensures scalability, robust data processing, and secure model execution for future growth.



Healthcare Solutions

www.techlogix.com/healthcare

Techlogix helps its clients develop solutions that optimize healthcare IT investments for better business and care outcomes and by developing new platforms for supporting innovative care delivery models.

We bring our deep domain experience in healthcare and expertise in healthcare technology to each engagement. Our consultants analyze your problems, recommend a solution, and then develop and implement it.

Supported by our technology practice areas (Innovation & Product Engineering, API & Integration Services, Cloud Transformation, Data Analytics & AI, Business Process Management, and Enterprise Mobility) and leveraging a library of our pre-built modules, we implement solutions in an extremely cost effective and efficient manner.

Contact

For more information, contact info@techlogix.com



About Techlogix

Techlogix is an IT services, consulting, and business solutions company that helps its clients use innovation and emerging information technologies to digitally transform their business. Our globally distributed development teams build high performance solutions leveraging our practice-specific delivery methodologies. Our people combine the spirit of engineering excellence with a strong commitment to deliver a delightful end-to-end customer experience. Techlogix employs approximately 600 people in 6 delivery centers worldwide.

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