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Company

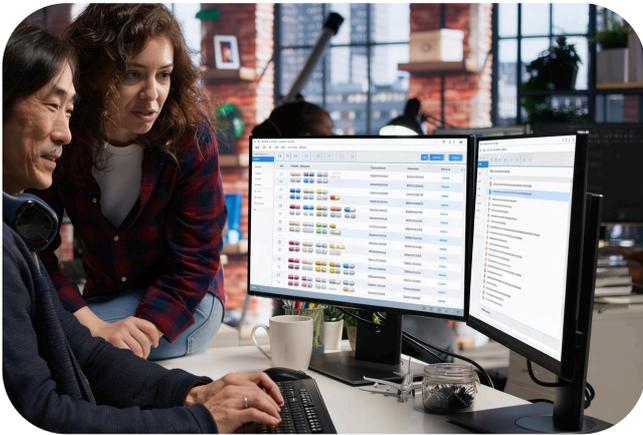


Digital Data Solution for Drug Inventory Management

A comprehensive IoT and software platform that provides real-time visibility and actionable insights into drug inventories, transforming conventional storage into a smart, data-driven system.

Overview

- **Real-Time Inventory Tracking:** Replaced conventional storage with smart medical bins equipped with IoT sensors, providing instant visibility into drug levels and usage.
- **Operational Optimization:** The solution minimized overstocking and stockouts, reducing drug wastage and optimizing labor costs.
- **Actionable Insights:** Transformed raw data into meaningful insights presented through user-friendly dashboards and mobile apps, enabling hospitals to make informed decisions and improve patient care.



Client Profile

A US-based startup specializing in software solutions that digitize operations and processes for healthcare providers, including hospitals and clinics.

Challenges

- **Manual and Inaccurate Tracking:** Inventory management relied on manual audits, which were time-consuming, prone to human error, and provided only a static view of stock levels.
- **Lack of Real-Time Data:** The system was unable to provide real-time insights into drug distribution, leading to stock imbalances across departments.
- **Inventory Imbalances:** The inability to track location-specific demand resulted in overstocking in some areas and shortages in others, leading to wastage and delays in patient care.
- **Delayed Patient Care:** Inefficiencies in the supply chain directly impacted the ability of healthcare staff to access necessary medications, affecting the quality and timeliness of patient treatment.

QBurst Solution: Digitized Solution for Drug Inventory Management

QBurst developed a comprehensive, end-to-end solution that seamlessly integrates with new hardware components to digitize drug inventory management. We worked closely with the client to deliver a complete suite of services from design to deployment and maintenance. The entire system relies on AWS Greengrass for edge intelligence and Flutter for cross-platform mobile functionality.

Key Components

- **IoT Integration:** We enabled real-time data transfer from smart medical bins, equipped with IoT sensors, to the cloud. Every action—stocking, dispensing, and replacing medicines—is captured as a real-time event.
- **Data Processing and Analytics:** A scalable consumer application was built to process event data in real-time, calculating utilization, current stock, and usage trends.
- **Intuitive User Interfaces:** The processed data is presented on user-friendly dashboards via a web application and a mobile app, allowing healthcare staff to monitor inventory from anywhere.
- **Predictive Insights:** The system was designed to analyze historical data and predict future usage, enabling healthcare facilities to precisely manage replenishment and avoid stockouts or overstocking.

Technical Highlights

- **Real-Time Data Streams:** We utilized AWS Greengrass for real-time event publishing and Kinesis streams for scalable, ordered event processing from multiple IoT devices.
- **Performance Optimization:** Introduced server-side caching layers to overcome performance bottlenecks associated with document-based databases, ensuring fast data retrieval.

- **Flexible Bin Modes:** Developed a feature that allows users to switch bin modes via the mobile app, with real-time feedback from the physical devices, ensuring operational flexibility.
- **Robust Maintenance:** Implemented a system for real-time log captures and periodic batch jobs to ensure data integrity and facilitate proactive bug fixing.

Impact: Enhanced Operational Efficiency and Quality of Care

- **Improved Operational Efficiency:** The automated system eliminated the need for manual audits, streamlining inventory management and freeing up staff to focus on patient care.
- **Reduced Costs & Wastage:** Real-time visibility and usage predictions minimized overstocking, reducing drug wastage by over 40% and significantly lowering operational costs.
- **Enhanced Quality of Care:** The solution ensures timely and accurate distribution of medicines, directly improving the quality and responsiveness of patient care.
- **Streamlined Deployment:** DevOps support and a well-defined release process ensured a smooth and timely deployment of the MVP, accelerating the client's time-to-market.
- **Scalable Architecture:** The robust and modern technical stack ensures the solution can easily scale to accommodate future growth and new features, providing a long-term strategic advantage.