

Pediatric Practice Creates Custom Software for Vaccine Inventory Control

A pediatric practice with multiple locations needed to solve an inventory problem. By partnering with Digital Mettle to integrate custom business automation software into their workflow they saved an estimated \$1 million annually.

Goals

- Decrease inventory loss and improve efficiency
- Determine, test, and implement best practices within existing workflow
- Deliver solution that is easily adopted by employees

Approach

- Conduct interviews with staff to understand the current process
- Evaluate the current workflow to determine the integration points
- Create, deliver, and support custom software that meets all goals

Technology

- Windows PCs and Servers
- Desktop application written in C# .NET deployed using Clickonce Installers
- Microsoft SQL Server Database
- C# REST webAPI central server
- Datalogic 2D bar code scanner integration
- Zebra label printers

Results

- \$1 million annual inventory loss eliminated upon launch of software
- Added value to nursing staff with ability to quickly report on clinic activity
- 100% adoption rate through automating processes

Challenge

For a pediatric group with seven locations, inventory control of vaccines and other supplies had become a critical problem. The company was faced with several issues, including missing inventory, overstocked vaccines expiring, and general inefficiencies in the ordering and restocking process.

Starting with a clean slate and no legacy system, the client was positioned to take this challenge head-on and specify the exact system and workflow that would best meet their needs. It was a perfect time to examine how custom software could not only aid in the inventory control issues, but also with compliance reporting and patient check-in procedures.

Learning the client's current challenges

The first step in solving this client's inventory issue was to get an understanding of the current problems and what, if any, software solutions had already been implemented. The client used spreadsheets to attempt to manage receipt of orders and to track supply levels at the clinic locations, but the procedure was inconsistent. There was no ability to coordinate inventory between clinics.

This led to the problem of expensive vaccines expiring and being discarded at one location, while other locations were ordering new inventory of the same vaccine at the same time. Vaccine expiration alone could not account for all of the losses the client was encountering, so detailed accounting of accidents and other losses was needed.

A further investigation was done to determine if any existing off-the-shelf inventory package could suit the client's needs.

The client's size placed it between the tiers of solutions offered in the market. Only a true custom solution would help.

Employee input maximizes efficiency of new system

During the process of planning a new software solution several informational sessions were held with staff at the clinics to obtain valuable input on what processes would aid in their day to day routine. User interface ideas, input devices, and output reporting were all influenced by these sessions and led to greater initial understanding of the inventory system when it was rolled out to all the locations.

One challenge was highlighted in several of the design sessions: difficulty of consistent adoption among all staff members. Given the workload of the medical staff of the clinic, the nurses in particular, time is always at a premium. Anything which distracted from the ability to quickly and correctly administer care to their patients was going to be omitted at some point. While the new Inventory system needed universal accountability of who used each item in inventory, this had to be done automatically.

Understanding this premium on time, the solution was able to incorporate several time-saving features which assisted in uniform adoption.

Solving the inventory issue and enhancing workflow

The software solution developed for this client included a centralized database backend connected to clinic locations via desktop applications with an automatic deployment and update mechanism. The applications were enabled with barcode scanners to facilitate fast and efficient processing during use. User badges with barcodes were created for quick log-in.

A new central receiving warehouse was created and made responsible for labelling all inventory with unique barcodes. Patient check-in procedures were optimized by integrating with the client's EHR system to synchronize patient identifiers and to produce ID labels for patient charts and specimen vials. Clinic workers can now log in and scan patient charts and vaccines within seconds. The speed of this process greatly increases the accuracy of the inventory record.

Beyond the inventory, a new way to serve clinics

Controlling inventory was the primary concern addressed by the new software system, but there was an opportunity to increase efficiency at the clinics by producing inventory reports and audit trails. This new capability gives staff the ability to be proactive in assessing current supply levels and producing reconciliations on an ad hoc basis. Administrative users can also produce full reports across all locations and see the trends, as well as verify supply numbers.

New software developed for the market

Going forward, the future of this system looks bright. The client was approached by the producers of their EHR software to investigate the possibility of turning this custom solution into a commercial application. As the process moves forward, the lessons learned in this venture may soon be shared with other medical practitioners across the country.