### Integration Solution Aggregates HL7 ORU Alerts for Large Regional Hospital

As with other regional hospital medical centers in the country, this not-for-profit has to carefully evaluate technology before allocating precious dollars towards it. It looked for a technology solution partner to make the most of its lean IT resources and address critical workflow as well as integration issues. Lab result alerts from the hospital's LIS were a persistent pain point for providers - inundating physicians to the point where the alerts were no longer meaningful or manageable. A tsunami of complaints from the providers was overwhelming the hospital's lab and IT. Physician burnout was also a concern. A way to consolidate these results into one report was desperately needed – now! The client turned to PilotFish to fix this acute problem and a long list of other integration challenges. Discover how PilotFish's HL7 Interface Engine was leveraged to solve this immediate HL7 ORU challenge and position the lab for further CPOE implementations and hospital expansion.
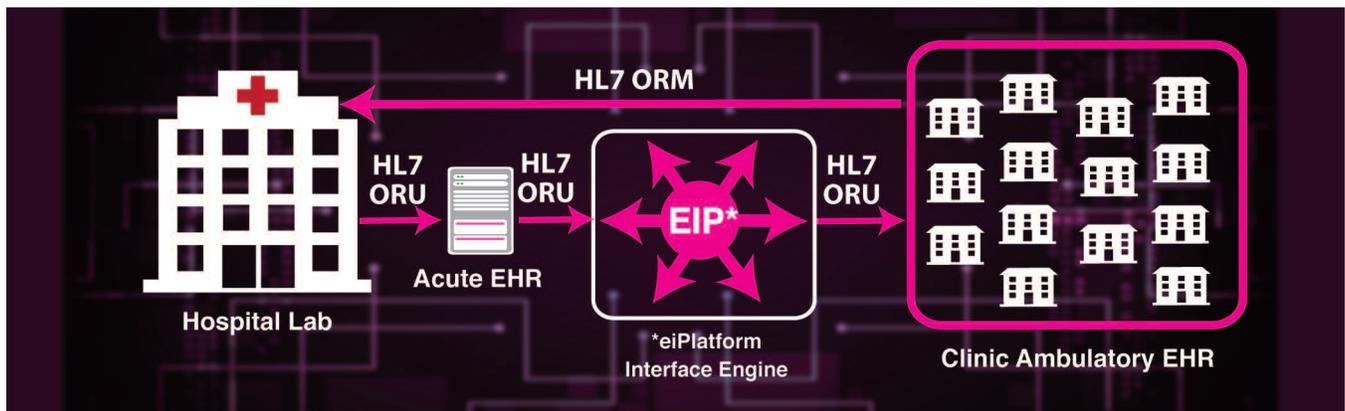
THE CLIENT

The client is a large award-winning regional hospital medical center, offering the most comprehensive primary, specialty and subspecialty care in the region. It offers full services for medical, surgical, obstetric, pediatric and critical care patients. A full suite of technical and professional services meet population healthcare needs for inpatient, outpatient and emergency care. This hospital medical center also supports outpatient practice sites on its large campus. Established physician practices are affiliated for cardiology, family medicine, general surgery, otolaryngology and more. The hospital health system includes campus and satellite ambulatory and inpatient centers and units - such as the women's diagnostic center, advanced wound center, hepatology clinic, inpatient rehabilitation unit and outpatient rehabilitation center and inpatient and outpatient behavioral health services. As a not-for-profit hospital medical center, all of its profits are committed to investments in upgrading facilities, expanding technology and continuous improvement of operations.

THE CHALLENGE

According to the CDC, 14 billion lab tests are ordered annually and 70% of medical decisions depend on laboratory results. Needless to say, reporting lab test results efficiently to providers is a critical workflow for patient care.

HL7 ORU RO1 results reporting required an immediate make-over before the switchover to computerized provider physician order entry (CPOE). What the client needed fast was for all medical lab results under one order to be sent together on a single result message to the provider for acknowledgement.

The challenge was that the hospital's LIS-to-EMR system sent a separate HL7 ORU RO1 result message for each result exactly at the same time that it is resulted. Complexity comes from the fact that some components of the test result are available hours before others, even when they are part of one orderable test. This ended up with a provider clinic EMR receiving a huge number of different result alerts for each provider - whether part of a single order or not. Considering how many tests physicians order at one time for each patient and the number of patient tests going through the lab in a given day, physicians were being overwhelmed.

Valuable time was being lost keeping track of these alerts and diverting a physician's time from patient care. At the time too, lab orders to requisition patient tests were communicated to the lab via paper formats of various types. These all had to be transformed into digital orders via manual processes.

So the reengineered workflow had issues to solve both at the input and output ends to enable the frustrated providers to receive aggregated patient test results.

The internal IT group had limited bandwidth to deal with this pressing problem. The PilotFish team innovated and implemented a simplified, elegant solution to aggregate HL7 ORU RO1 results. Providers accepted the solution almost instantly. Design and build occurred concurrently.

THE SOLUTION

The hospital went with a strategy to deliver a new reporting system to providers with a big bang - no phased-in approaches. PilotFish, the leader in healthcare data integration, was selected to address the complexity and issues inherent in these HL7 ORU data exchanges and integrations. PilotFish's eiConsole for HL7's automated graphical nterface assembly line process and the visual drag-and-drop Data Mapper require no custom coding or scripting, thus speeding up integrations solutions and interfacing implementations.

PilotFish's eiConsole delivers impressive built-in capabilities for incoming data validation and translation, outgoing transaction construction, acknowledgement generation, process orchestration and scheduling. Every configuration follows the same consistent methodology, enabling reuse and adaptation of components or entire integrationtemplates.

The PilotFish team completed business process modeling on the fly. That, of course, included the processes that are documented as well as those that are undocumented but make things work or impede them. Their workable model captured both the current state of the processes and the future ideal state. The logical order of the tasks, the data flow, access control and managing the volume and speed of inputs and outputs in the workflow were identified for the critical interfaces by PilotFish's software engineers.

PilotFish, together with database utilization for process orchestration, ingested all HL7 ORU RO1 result messages from the hospital EMR. In the HL7 Standard, an Observation Result ORU message is a structured report where each observation is separated into an individual entity and then separated into fields. The HL7 ORU RO1 message transmits the observations from the producing system to the ordering system. (In other cases, it can go to a medical archival system or to another system not part of the ordering system. Providers also generally get copies of an inpatient patient's test results from the acute care system.)

PilotFish used process orchestration to combine all results for a single order ID into one HL7 ORU result message. They then released all the consolidated messages out to the ambulatory care EMR on a specified schedule with triggers for release of the sending data. PilotFish's team architected the workflow automation to:

- Receive HL7 ORU RO1 messages from the Hospital EMR system
- Organize and orchestrate HL7 data in a relational database
- Join messages, if applicable, according to specified order and patient identifiers
- Aggregate into one HL7 ORU message, if multiple messages for one order ID are received during specified holding period
- Send all held and combined HL7 ORU messages to the Clinic EMR system on a specified schedule
- Allow all results with STAT priority to bypass the holding period and immediately post
- Create an error routing, error viewing and message re-start workflow

Both the providers' EHR and the hospital's EHR were embarked on CPOE transformations to support the services of this heavily relied-upon regional hospital medical center. Computerized provider order entry (CPOE) systems are designed to replace a health systems paper-based ordering system. CPOE is an application that enables providers to enter medical orders such as lab and radiology orders into a computer system that is located within an inpatient or ambulatory setting.

A key group of clinical leaders were early supporters of the introduction of PilotFish to accelerate delivery of a solution. They championed the move to electronic order entry of lab orders in the clinics which more seamlessly allows the patient's test results to be grouped by way of PilotFish, versus ungrouped without electronic order entry.

THE BENEFITS

First and foremost, physicians are no longer overwhelmed with a seemingly endless stream of medical lab result alerts. With consolidated patient results delivery, physicians can focus on diagnosing and providing informed medical care to patients.

In-house IT staff dedicated to building and maintaining multiple interfaces with multiple systems can be a big budget drain. PilotFish has obviated the need to invest in and build their own interface platforms and invest in costly resources to enable LIS-to-EMR or any other integration with any other systems. They now avoid costly interface fees for every vendor system or EHR data exchange.

PilotFish supports and adeptly handles every major healthcare standard and source – HL7 2.x (all versions), HL7 3.x, EDI, NCPDP, CDA, FHIR, XML and data sources outside of healthcare. It is source, database and system agnostic. Legacy systems interfacing and integrations are no problem. PilotFish is also fully extensible to support virtually any new standard.

PilotFish offers the flexibility, experience and expertise to create solutions to meet client needs as they emerge. In this case, PilotFish innovated a custom HL7 monitoring and queuing system for those messages that run through PilotFish. A real-time web-based HL7 message tracking (plus research) system was soon used by hospital IT and the lab managers. The client is able to see what's pending and what has already been processed, per certain cycle times during a 24-hour period. The functionality is built in to view errors, restart messages and re-queue.

PilotFish's problem-solving and innovative solutions significantly helped drive modernization and automation forward as this crisis required. PilotFish led and implemented this integration, but available hospital IT staff were trained on PilotFish software as well. An ongoing collaborative partnership is speeding up to efficiently tackle the tall technology stack.

PilotFish works with companies in the way that works best for them and their objectives. PilotFish Interface Engine software offers extensive online training and documentation. PilotFish software engineers are available to you on as needed-basis. Lead engineers, if desired, can be on site. We can troubleshoot or come in and implement from end to end - training your staff as we go.

THE FUTURE STATE

Establishing modern clinical data connectivity to physician EHRs by hospital labs first improves the ability to provide patient care but it also improves pre-authorizations, history used by the providers to bill the encounters, provide documentation to appeal denials and deal with utilization issues, etc.

With the quick success of this crisis project and other PilotFish initiatives, the executive, clinical and IT leaders have identified additional key areas and systems where PilotFish will be leveraged.

Over the course of nearly 15 years and hundreds of implementations, PilotFish has developed and refined a methodology for the configuration, testing and deployment of interfaces and process orchestrations. We have an unblemished track record of success. Through years of Bake-Offs and Proof of Concepts (POCs), we have demonstrated the value of our integration engine solutions to future customers. Let us conduct a Free Use Case Evaluation for you to determine where PilotFish can provide the most value to your organization and solve your most complex integration challenges.

To schedule a Free Use Case Evaluation and to learn about what PilotFish Solutions can do for your organization, please contact us at 860 632-9900 x 309 or Email us at info@pilotfishtechnology.com