



Consulting Project Recap

West Virginia University Hospitals

Epic Implementation

Project Overview

WVUH's Epic implementation, named Merlin, was focused at integrating the electronic clinical record with appointments, registration and billing and providing authorized patients and healthcare providers with online access to clinical information. The Merlin project was divided into 2 major go-lives, which included interfaces between various legacy systems and the major Epic modules, consisting of ADT, ASAP ED, Beacon Oncology, Cadence Scheduling, Chart Deficiency Tracking HIM, Clarity, Device Integration, EpicCare, MyChart, Optime OR Management, Prelude Registration, Radiant, Resolute Hospital Billing, Resolute Professional Billing and SureScripts.

Project Scope

For the Merlin project, the WVUH Integration team managed the Cloverleaf Engine application and the Epic Bridges module. The Integration team was responsible for the project planning/analysis, build, testing, implementation, support and maintenance of all Epic HL7, X12 and data extraction/conversion interfaces with the legacy systems.

WVUH contracted with Santa Rosa Consulting to acquire strong functional and certified Cloverleaf and Bridges Consultants to help meet the project's integration needs. The consultants were expected to:

- Help assess the current interfaces and make recommendations for proposed new interfaces with Epic.
- Assist in interface planning meetings and development of specifications to document field mapping between Epic and legacy systems.
- Assist in the design of new workflows and dataflows to either replicate or enhance current functionality.
- Contribute to project meetings and ensure tasks were completed by the correct resources in a timely manner.
- Work with application owners and vendors to build and test interfaces between Epic and legacy systems.
- Provide interface go-live support and maintenance in the production environment.
- Follow existing standards and procedures for interface development and support.
- Transfer knowledge to the WVUH Integration team to ensure all interfaces could be easily supported when the contract expired.

Project Challenges and Solutions

WVUH experienced many integration challenges during the various phases of the systems development life cycle effort with their Epic implementation. These integration challenges faced by WVUH and the solutions provided by the Santa Rosa Consultants are documented below.

Challenge: WVUH had little experience with Epic Bridges.

Solution: The Santa Rosa Bridges Consultants helped to educate and train the WVUH Integration team members on how to navigate Bridges and use the various Bridges utilities in both Text (back-end) and Hyperspace (front-end GUI). Specifically, how to:

1. Configure and manage Bridges Interface Specifications (add, update and remove profile variables and their associated settings, set communication parameters and the MSH segment, set the automatic start/stop settings, write and manage Error Screening Code, create and manage custom overrides and items, and set up Patient Duplicate Detection/Extended Validation).
2. Create and run custom Error Reports.
3. Create and manage Bridges Translation and General Tables.
4. Create custom Interface Monitors and set up advanced monitoring options from the Background Monitor to alert the WVUH Integration team when an interface has been stopped manually or unexpectedly and/or excessive messages have queued, based on the interface volume and criticality.
5. Save interface messages to a flat file and load interface messages from a flat file for queue processing.
6. Search, view, edit and resubmit interface messages.
7. Remove messages from a queue.
8. Pack and unpack database (master file) records into or from ETAN files.
9. Investigate interface issues by understanding Epic's database management structure of networked master file records in Chronicles, how HL7 messages are processed or created in Bridges, where the data is stored or pulled from in Epic and how to view specific master file records.
10. Pinpoint exactly where a problem occurred according to the nature of the issue (Legacy system, Engine, Bridges or Epic Application).
11. Understand Results Routing as it relates to interfaces, verify Inbasket message delivery and how to send Inbasket messages to other users.
12. Use Lookitt, a Cache Programmer's Toolkit, and run various functions/commands from the Lookitt prompt.

Challenge: How to prepare for a major Epic go-live from a Bridges and Cloverleaf Engine perspective.

Solution: The Santa Rosa Bridges Consultants developed a project plan, which detailed the individual tasks for all Bridges work to support both the Wave 1 and Wave 2 go-lives. This included both conversions/data loads and real-time interfaces. As part of the project plan, the Bridges Consultants moved all interface specifications, custom interface components, translation tables, custom monitors, custom interface routines and Interface Error Workqueues from the primary testing environment to Production for both go-lives. This

process was carefully reviewed with the WVUH Integration team. The Bridges Consultants also provided suggestions for testing Production interfaces by conducting a pre go-live Dry Run, where the interface connections are tested end to end and controlled workflow scenarios are executed using test patients to ensure the interfaces are behaving as expected. The Cloverleaf Consultants assisted the WVUH Integration team in setting up and maintaining multiple Engine “test sites” to coincide with the various Epic test environments. The primary test site was then prepared and promoted to the Engine production site for both go-lives.

Challenge: How to support a major Epic go-live from a Bridges and Cloverleaf Engine perspective.

Solution: The Santa Rosa Bridges and Cloverleaf Consultants participated in both the Wave 1 and Wave 2 go-lives, providing 24/7 coverage for the 2 weeks following each go-live. The Santa Rosa Consultants were major contributors in the Command Center during the weeks that followed the go-lives by supporting end users and working with providers, project leads, department managers and compliance teams to propose solutions for and quickly implementing fixes to unexpected issues in Bridges and the Engine. The Santa Rosa Consultants devised innovative and strategic methods for data remediation when large scale issues arose that required involvement from multiple cross functional teams. The Santa Rosa Consultants also suggested developing best practices and lessons learned documentation regarding interface issues and implementation procedures as a post go-live activity.

Challenge: How to handle interface errors.

Solution: The Santa Rosa Bridges Consultants developed WVUH’s Epic interface error handling process. The Bridges Consultants created and managed the Interface Error Workqueues, custom rules applied to the Workqueues, custom Workqueue views and custom properties used by the rules and views for all Wave 1 and 2 real-time and conversion interfaces. The Bridges Consultants created custom EDI security classifications for the various Workqueue users. Additionally, the Bridges Consultants created documentation and trained end-users on how to navigate and manage Workqueues, understand interface logged errors and remediate these errors. The Cloverleaf Consultants assisted the WVUH Integration team with Engine error handling and message flow and optimization issues to create a more efficient Engine environment.

Challenge: WVUH had inexperienced Application Coordinators (ACs) assigned to manage and conduct Epic Application build activities. These ACs were overwhelmed since the Application teams were understaffed. The Epic Application build affects the interfaces, so this presented a potential issue for the WVUH Integration team.

Solution: The Santa Rosa Bridges and Cloverleaf Consultants suggested that the Application teams solicit additional help from within WVUH or from Epic and setup weekly calls to review issues and project status. The Bridges Consultants also worked closely with the WVUH Application teams to help them understand how their build affected interfaces and what specific build was needed to support the individual interfaces. This build involved adding master file records, adding identity IDs, loading category lists, and configuring and creating custom print groups and programming points. The Bridges Consultants also helped test workflows to pinpoint specific builds that were missed. The Bridges Consultants developed documentation detailing the Application build requirements to support the various

interfaces. This documentation proved to be a very useful tool during initial build activities in the testing environment, migration to Production, and for post go-live support and maintenance.

Challenge: The WVUH Integration team was understaffed and couldn't manage all the new Epic interfaces for both the Wave 1 and Wave 2 go-lives.

Solution: The Santa Rosa Bridges and Cloverleaf Consultants assumed Project Management roles for various interfaces, which involved configuring the Bridges interface specifications and the Engine interfaces. Many of these interfaces required specialized programming to address unique scenarios. The Santa Rosa Consultants managed all interface related issues, facilitated weekly status meetings, supported and led the interface testing efforts and developed the project plans to ensure the interfaces were ready for go-live. Additionally, the Bridges Consultants participated in Epic system demos for the executive level team members to assist them in making informed decisions regarding Epic functionality.

Challenge: The WVUH Lab handles the resulting of specimens and billing at the patient and facility level for a number of outside physician offices under a group called University Medical Lab or UML. The UML ADT and billing interfaces with Epic were severely behind schedule for Wave 1 before any Bridges Consultants were hired.

Solution: The Santa Rosa Bridges and Cloverleaf Consultants assumed Project Management roles and worked closely with UML and Epic to design and document complex interface workflows to support UML's unique requirements. The Santa Rosa Consultants configured the Bridges interface specifications, coded the Engine interfaces, managed all issues and led the testing efforts to ensure the interfaces were ready for go-live. Additionally, the Bridges Consultants helped develop and document the process for adding a new UML Client.

Challenge: WVUH needed the lab services performed in studies or in confidential departments to be billed out of Epic at the department level and not at the individual patient level.

Solution: The Santa Rosa Bridges and Cloverleaf Consultants proposed and helped implement a solution which involved creating accounts at the department level in Epic (for all study departments and defined confidential departments) and then coding the lab and pathology billing interfaces in the Engine and Bridges to ensure charges/credits in these departments were posted to the appropriate accounts. This ensured that no individual patient would be billed for lab services performed in a study or in a defined confidential department. Additionally, the Bridges Consultants helped develop and document the process for adding a new study or confidential department.

Challenge: Epic always had 2 active test environments, but most downstream systems only had one test environment.

Solution: The Santa Rosa Cloverleaf Consultants, in conjunction with the WVUH Integration team, devised and implemented a plan to create a third Engine test site to be a "feeder" site. This "feeder" site was setup to accept feeds from both Engine test sites and then send the messages downstream to the appropriate legacy system with a "site identifying tag" in the MSH segment. The various vendors were requested to send this "site identifying tag" back in all return messages, so the "feeder" site could determine to which test site to send the inbound message. This solution alleviated time consuming and confusing switches of both inbound and outbound Engine connections and allowed for real-time and seamless message flow into and out of all test environments.

Challenge: Some legacy systems receiving the Epic ADT feed had their own unique provider IDs.

Solution: The Santa Rosa Bridges Consultants worked with the HIM and Cadence Application teams to ensure all possible Identity IDs for a provider were added to Epic's SER master file. The Bridges Consultants configured the outbound ADT Registration Interface to always send a comprehensive list of all possible Provider IDs maintained by the various downstream legacy systems. The Santa Rosa Cloverleaf Consultants then designed and coded a solution in the Engine to only send a specific ID for each route using a hierarchical logic depending on the receiving system (e.g. For the Sunquest Lab Information System, pass on the Lab Initials ID, but if not present in the message, pass on the SER Dot One ID).

Challenge: Some legacy systems that send results messages to Epic could send a variety of provider IDs (e.g. The Sunquest Lab Information System could send a Lab Initials ID or the SER Dot One ID; the CoPathPlus Pathology System could send a HealthQuest ID or the SER Dot One ID).

Solution: The Santa Rosa Bridges Consultants designed a solution to create a new Identity ID Type in Epic called Results Provider with an Identity code of REPROVID. This new Identity ID Type would house a copy of the SER Dot One ID, the HealthQuest ID and the Lab Initials ID for each Provider in their SER master file record. The Cloverleaf Consultants then coded the results interfaces on the Engine to overwrite the Identity ID Type code with REPROVID in all provider related fields, so Epic could locate the appropriate provider record using Identity based on the new Results Provider ID Type.

Challenge: Transcription workflows required certain Ophthalmology documents and letters for external providers to be automatically routed to a set of users for scanning and mailing. The old method was to send the documents to printers in the appropriate departments.

Solution: Since Epic did not support auto-printing of documents, the Santa Rosa Bridges Consultants designed a solution to create user pools in Epic that would receive documents based on the document type sent from the Transcription legacy system. The Cloverleaf Consultants coded the Engine to insert a specific pool ID into the document CC field based on the document type, so Bridges could route the document appropriately in Epic. This allowed users to access the document and print/scan/mail as necessary. In addition, if the user list had to be modified, this involved only updating the pool recipient list in Epic, so no changes would be necessary in the legacy system.

Challenge: WVUH had three separate provider databases that were being updated/accessed for transcriptions and the only common key was the provider's name.

Solution: The Santa Rosa Bridges Consultants put together a process where Epic became the system of record for provider information (i.e. IDs and Addresses). This solution allowed WVUH to sunset the third provider DB (called MARs), thus only requiring the Transcription (eScription) provider DB to be in sync with Epic's Provider DB (SER master file). The first part of this solution involved creating a nightly batch load of provider information from Epic to eScription. This load file was set up with the same format as the file that was previously being sent from MARs to eScription, allowing for all provider (including all internal providers and some external providers) adds, updates and deletes to originate in Epic as it once did in MARs. With this load process, all information for external providers was overwritten with the information in the Epic SER master file. Additionally, the SER Dot One ID would now be used as the primary key for address changes, which is far more efficient and secure than using the provider's name.

The Bridges Consultants also implemented a solution for adding new external providers to Epic. The Transcription system was configured to send the SER Dot One ID to Epic for all external provider CCs. If the SER Dot One ID was blank, the interface was configured to send the document to a user pool to indicate the provider was missing from the Epic SER master file. In addition, a flag was added to the user's Inbasket to indicate the document contained a new provider, so there would be no confusion when an Add was required. Finally, the users were trained to look in the document text for the provider address to use when creating the provider record in SER as this information already existed in eScription.

Challenge: The manager for Ambulatory transcriptions was overwhelmed by the transition process from the legacy system to Epic. As a result, during go-live, there were many issues that arose due to user error.

Solution: The Santa Rosa Bridges Consultants worked closely with the Transcription manager and her Medical Transcriptionists (MTs) to go through each workflow during Integrated Testing and go-live and explained why each error was occurring and how to remediate. The Bridges Consultants coordinated a solution where the MTs would have fewer patient visits to choose from by filtering unnecessary ADT messages from going to the Transcription system. Also, the Bridges Consultants trained the MTs on how to navigate through the patient Chart in Epic Hyperspace to determine the correct patient visit to which the transcriptions should be attached. Finally, the Bridges Consultants implemented solutions to simplify workflows for the MTs, including programmatic changes to provide more flexibility in filing certain document types without opening up avenues for incorrect message filing, automating CC entry and workflow changes to allow certain documents to be transcribed from the Hospital system.

Challenge: Close to go-live, a major scope change required a Cardiology Results Interface to be combined with the inbound Transcription Interface.

Solution: The Santa Rosa Consultants worked quickly and diligently to integrate the new interface requirements into an already complicated interface setup. The Santa Rosa Consultants gathered the message requirements for the interface and then transformed the result message (ORU) from the legacy system into a document message (MDM), adhering to the specs. The changes were tested very quickly, but comprehensively. Therefore, there were no major issues with the results portion of the interface at go-live. Also, the additional feed did not have any negative impact on the original MDM messages.