GALEN
HEALTHCARE SOLUTIONS

NAVIGATING THE TRANSITION FROM CPSI TO EPIC
April 6, 2016

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Who are we?

Erin Michaud – Clinical Conversion Analyst

- Epic Willow Certified
- Experienced project manager
- Worked with Epic and healthcare IT for over 8 years

August Borie – Technical Conversion Analyst

- Epic Bridges Certified
- 5 plus years in healthcare IT
- Experienced in conversions to Epic from a variety of legacy systems

Webcast Outline

1. Project Overview

2. Scope and Timeline

3. GalenETL and Data Extraction

4. Mapping

5. Technical Approach

6. Technical Challenges

7. Validation

8. Go-Live and Cutover

9. Summary of Lessons Learned

Project Overview

- CPSI to Epic conversion
- Converting a 45-bed hospital with multiple integrated hospital outpatient departments, located in the mid-west

Scope Description

Up to 5 years of data from CPSI

- HL7 Data Types
  - Encounters
  - Smoking Status
  - Immunization History
  - Imaging Results
  - Scanned Images
  - Transcriptions (E-sign and Digital Documents)
  - Vital Signs (All recording of Height, Weight, and Blood Pressure)

- CCD
  - Active Allergies
- Flat File Import
  - Primary Care Providers

5-10 years of lab data from SoftLab

- 5 years of General Lab, Micro, and Blood Bank
- 10 years of Pathology results

Patient Population and Data Counts

- 183,000 Patients
- 506,000 Encounters
- 185,000 Transcriptions
- 5,000 Immunizations
- 805,000 Vital Signs
- 116,000 Imaging Results
- 26,000 Smoking Statuses
- 1.3 million Scans
- 60,000 Allergies

Conversion Phases and Milestones

- Project Design
  - Project Kick-off
  - System Access and Technical Setup
  - Refining Scope
  - Project Plan
- Clinical Data Extraction
- Data Analysis and Mapping
- Validation (Unit Testing, Small Scale, Large Scale, and Full Scale)
- Go-Live Prep
- Go-Live
- Post Go-Live Support and Gap Loads

Overview

Conversion Timeline

- 7 month conversion
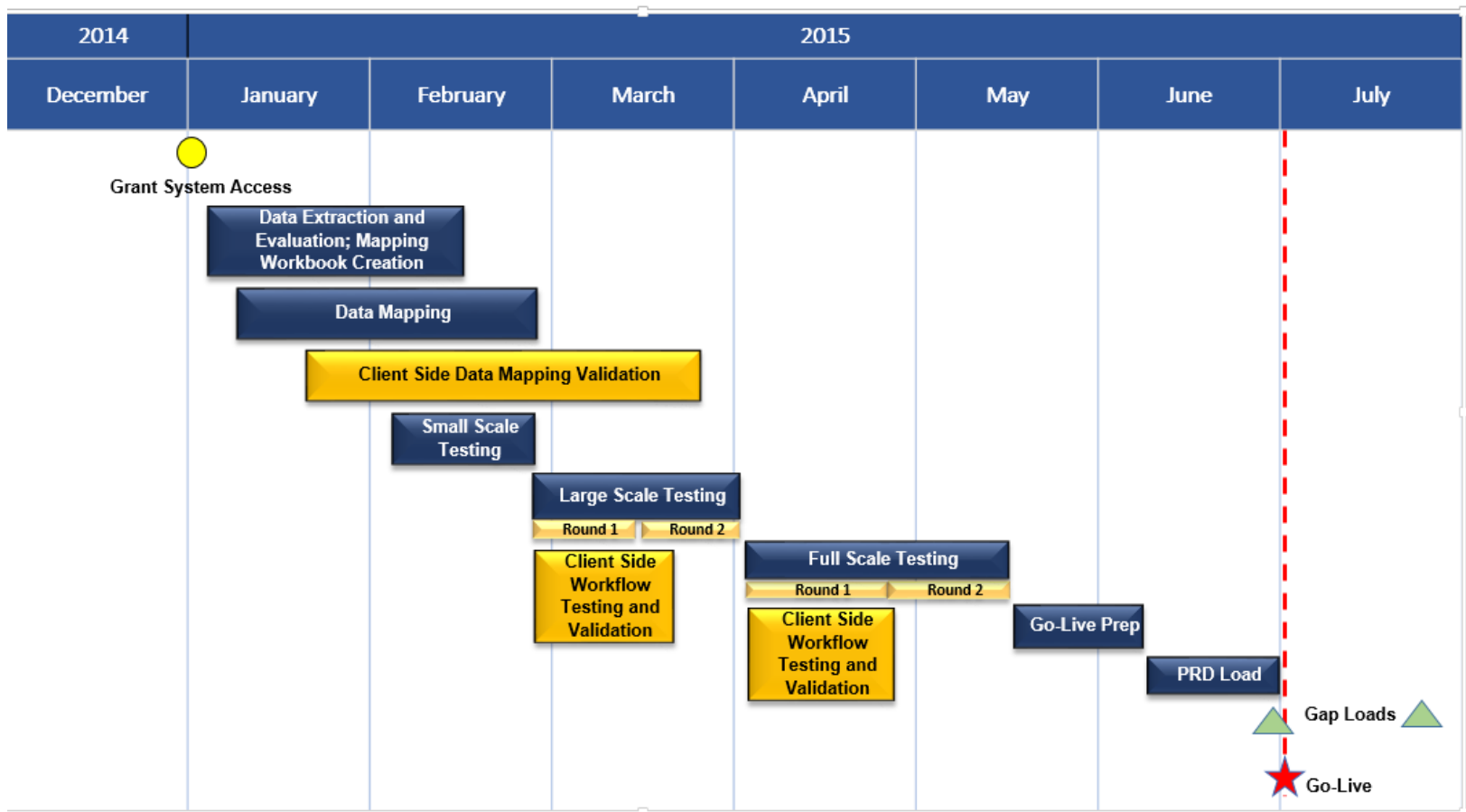
Scoping Strategy

- Met with specialized groups of stakeholders to refine scope
  - Lab and Imaging
  - Patient Demographics
    - Patient Demographics
    - Encounters/Visits
    - Primary Care Providers
  - Documents and Scans
  - Clinical Content
    - Problems, Medications, Allergies
    - Immunizations
    - Vital Signs
    - Smoking Status

Scoping Decisions

- Vital Signs – Last recorded vs. All
- Other Systems
  - Athena, MedAdept, Agility, OBIX
- Exclude Medications and Problems
- Scanned Document Types – Exclusion

Timeline Challenges

- Scoping adjustments after validation rounds
- PACS Conversion – adjustment to patient load timeline
- Extraction Issues - delayed testing
- Lab Conversion - vendor contract delays
- Inpatient Conversion – cutover considerations

GalenETL

Galen's Conversion Platform

- Highly scalable architecture
- Vendor agnostic
- Plugin based
- Centralized staging database
  - Clinical data
  - Patient data
  - Appointment data
  - Charge/Billing data
  - Provider data
  - Insurance
- Many outputs
  - Text files
  - PDFs
  - HL7 messages
  - CCD/CDA
  - RTF
  - Call SQL stored procedures
- Excellent at data extraction

Extraction Process

1. Develop query scripts to pull data out of legacy database

   - Locate scanned image files if in scope

2. Validate scripts by comparing against application view

3. Run extract scripts during off-peak hours or from copy of database

4. Stage data in GalenETL

5. Prepare mapping workbooks

- Multiple extracts executed throughout project
  - New mappings
  - New ways data is stored
  - Growth of data set
  - Gap extracts

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Mapping Process

- Creation of mapping workbooks
- Galen performs initial mapping
- All mappings are reviewed and signed-off by client
- Unmapped records
  - Build new records in target system

    Or
  - Create default record to map

Immunization

CPSI Immunization Code	CPSI Immunization Name	EPIC Immunization Code	EPIC Immunization Name	Usage in External System
999	unknown	28	Other	1156
24	anthrax	77	ANTHRAX	469
20	DTaP	29	DTAP (CHILD)	468
8	Hep B, adolescent or pediatric	1003	HEP B 3-DOSE, IM (PED/ADOL)	399
43	Hep B, adult	3	HEP B, IM	377
60	herpes simplex 2	70001	HERPES SIMPLEX 2	344
47	Hib (HbOC)	8	HIB PRP-T CONJUGATE, IM	289
46	Hib (PRP-D)	8	HIB PRP-T CONJUGATE, IM	242
151	influenza nasal, unspecified formulation	79	INFLUENZA NASAL	146
123	influenza, H5N1-1203	70002	INFLUENZA, H5N1-1203	70
135	Influenza, high dose seasonal	138	HIGH DOSE FLU	46
155	influenza, recombinant, injectable, preservative free	106	INFLUENZA PRESERVATIVE FREE	36

Mapping Challenges

- Blank allergies
  - Some allergies did not have a name in the database
  - Manual process to look them up in the application

- Lab mappings
  - Did not have a complete list of order/result codes to map to Epic
  - Worked errors in Epic and added entries to mapping tables

- Very specific scan types
  - Made it difficult to map to Epic's more generic scan types
  - Had to build CPSI specific entries

- Users able to free text BP position and BP location in CPSI
  - Impossible to map every single entry
  - Put all unmapped values in the comments sections

Mapping

Hospital Service/Patient Class

- Multiple layers of patient mapping for inpatient encounters
- Hospital Service
  - Specialty within hospital
- Patient Class
  - CPSI Stay Type (inpatient, outpatient, emergency)
- Driven by reporting initiatives

Duplicate Patients

- Same Medical Record Number (MRN) used by more than one patient
  - Sometimes same person, sometimes not
- Worked with outside vendor to identify record to keep
- Client resources handled merging true duplicate accounts in CPSI
- Same patient but different MRN
  - Duplicates worked in Epic after patient load

Scanned Image Conversion

- Chose to use Web BLOB server vs. OnBase Content Management System

	Web BLOB	OnBase
Interface Setup	Dedicated conversion interface	Single outbound interface to Epic (compete with production users)
Throughput	Limited by Interconnect and Epic Bridges interface	Limited by production users and manual loading of files
Technical Approach	Embedded content in HL7 messages	Physical PDF files with corresponding index file
Resources Required	No outside resources required	Separate resources required to send files though
Updated/Deleted Workflow	Programmatic via HL7 message type	Manual process

Scanned Image Conversion

- Stored converted image files on Epic Web BLOB server
  1. HL7 message contains base64 encoded image
  2. Interconnect receives HL7, saves embedded content to WBS
  3. Embedded content is replaced by image pointer
  4. HL7 message is sent on to Epic

- Images converted as PDF
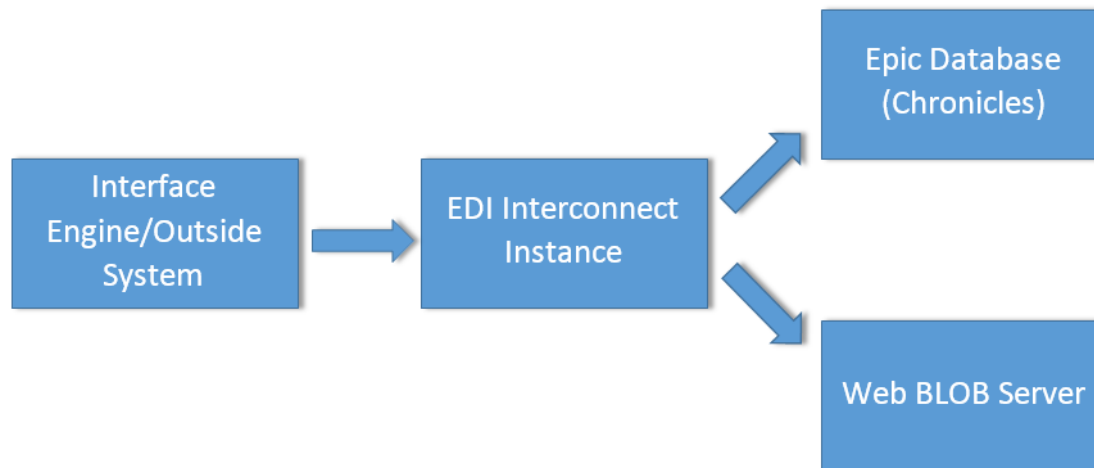
Lab Conversion

- Historical interface from SoftLab to Epic
  - Chose to take data from source (LIS) vs. CPSI
  - Data stored only semi-discretely in CPSI
- HL7 messages sent in batches
- Stored messages in interface engine before sending to Epic
  - Data transformations performed in the engine
  - More control over when/how many messages are sent
  - Able to report off message set as a whole

Custom Plugin Development

- CPSI data was stored in unique ways
  - Flat files vs. database – database only contained metadata
  - Data sometimes stored as free text inside text file (non-discrete)
    - E.g. Notes, lab results, and imaging results per visit stored in same file
  - Many text files combined and zipped up
  - Files stored on CPSI server
    - Needed to use FTP to pull files down
- GalenETL's plugin architecture allowed for extraction
  - Notes/transcriptions
  - Imaging results
  - Scanned Images
  - Sunquest
- Galen's development team supports every conversion project

Scanned Images

- Most images stored as proprietary CPScan files
  - Other file types – PDF, DOCX, JPG, BMP
- Plugin developed to convert CPScan files to PDF
  - Dedicated server required
- Stored in zipped folders based on account number
- Large PDFs
- Complex life cycle!

Compressed Folder Containing Many Scans → Individual CPScan Document → PDF → Base64 Encoded Text in HL7 Message → Stored PDF on Epic Web BLOB Server

Active vs. Archive

- Data sometimes stored in multiple locations on CPSI server
- Recent data lives in active directory, after certain number of days gets moved to archive directory
- Active location
  - Each clinical element has its own file
- Archive location
  - Clinical elements grouped together in same file by account number
- Notes/transcriptions and imaging results (lab results too)

Historical Encounters

- Encounters categorized as active vs. historical
- Separated into two tables in the database
- After certain number of days, move from active to historical

Gap Conversion Limitations

- CPSI limited in what is stored in the database
- Gap extracts require specific date or version auditing
- Last updated date or created on date not often stored
- Relied on workflow testing to determine what could be updated/deleted within CPSI
- Manual intervention sometimes required
- In some cases has to compare data points to see what had changed
  - Encounters

Large Imaging Results

- Some imaging results too large to send to Epic
  - Contained pictures within textual result
- Printed out and manually scanned into Epic

Validation Strategy

Validation Phase	Validation Content	Resources
Unit Testing	Initial testing of the interfaces and message formatting.	Galen
Small Scale	Usually 5-20 patients. First look at the data to see if there are any obvious issues with display and functionality in the target system.	Galen
Large Scale	Testing one of each type of mapping. Example: test one example of every single immunization type mapping.	Galen and Project Team
Full Scale	Convert all data in order to test a large sample size of converted data. This testing usually identifies any infrequent issues. This is also to estimate the timing of the imports into production.	Galen, Project Team, and End Users

Validation Considerations

- How to deal with delays
- Finding validation resources
- Gap validation
- Downstream workflow testing
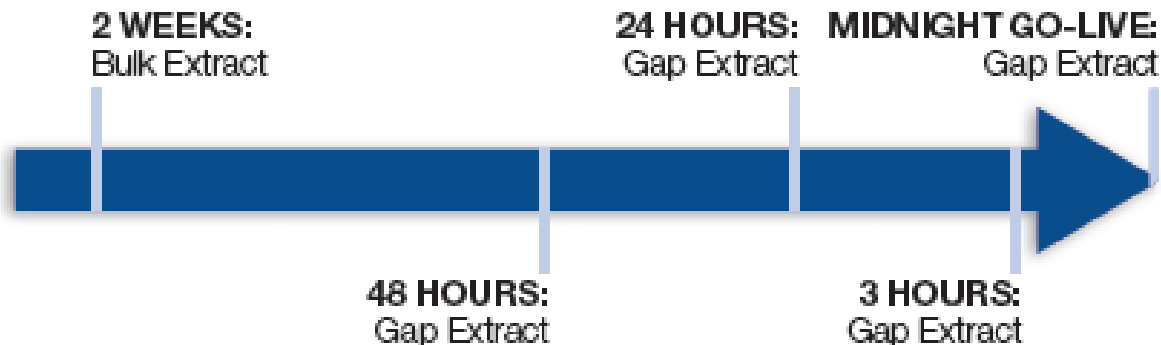
Go-Live Planning

- Start Early!
- Open communication between conversion team and implementation team
- Detailed cutover plan
  - Include communication tasks within cutover plan
- Use testing import times to determine how early the conversion should start

Inpatient vs. Outpatient

- Gap loads
- Admitted patients during cutover
- Open encounters

Gap Load Schedule

- No live feed interfaces, but needed most up to date information on the admitted patients
- The shorter the gap period the less time it took to import into Epic
- Initial Extract and Load – 2 weeks prior to go-live
- Next gap loads at 48 and 24 hours prior to go-live
- Final gap loads 3 hours prior to go-live and at midnight (time of cutover)

2 WEEKS:
Bulk Extract

24 HOURS:
Gap Extract

MIDNIGHT GO-LIVE:
Gap Extract

48 HOURS:
Gap Extract

3 HOURS:
Gap Extract

Admitted Patients

- Problem: How to convert data on the newly created admission encounters in Epic?

- We were only converting discharged encounters from CPSI. For the admitted patients during cutover, new encounters were created in Epic. However they wanted data converted for these patients.

- The historical encounters were converted with the CPSI Visit ID being placed in the Epic External ID so that the clinical data would match to the correct encounter.

- Since the admission encounters were not being converted, new admission encounters were created for the patients by registration.

- In order to have clinical data converted on the admission encounters, registration also manually enter the CPSI Visit ID in the External Visit ID in Epic.

Open Encounters

- Scope was limited to only converting closed or discharged encounters.

- Open Encounter Types
  - Old encounters never closed/discharged
  - Reoccurring encounters for OT, PT, Oncology
  - Current admissions

- Old encounters never closed – converted with a discharge date of the go-live.

- Reoccurring encounters – given time to close and then converted with discharge date of the go-live after last post-live gap load.

- Current Admissions – encounters not converted since they were manually registered in Epic and the clinical data was converted.

Summary of Lessons Learned

- **Scoping Considerations**
  - Identify all legacy systems in play
  - Unusual workflows
- **Technical Challenges**
  - Extracting data
  - Gap process
- **Duplicate Patients**
  - Identify ahead of time and resolve
- **Cutover Approach**
  - Plan, plan, plan
  - Consider using live interfaces
- **Post Go Live Activities**
  - Sun-setting legacy systems
  - Archiving legacy data – VitalCenter Online Archival

Conversion Services

Conversion Team

- Conversion Program Manager
  - Enterprise multi-system conversion projects
- Clinical Conversion Analyst
  - Project Management
  - Clinical Data Mapping
    - Certified laboratory and pharmacy technicians, nurses, etc.
  - Testing and Validation
- Technical Conversion Analyst
  - Data Extract
  - Transformation
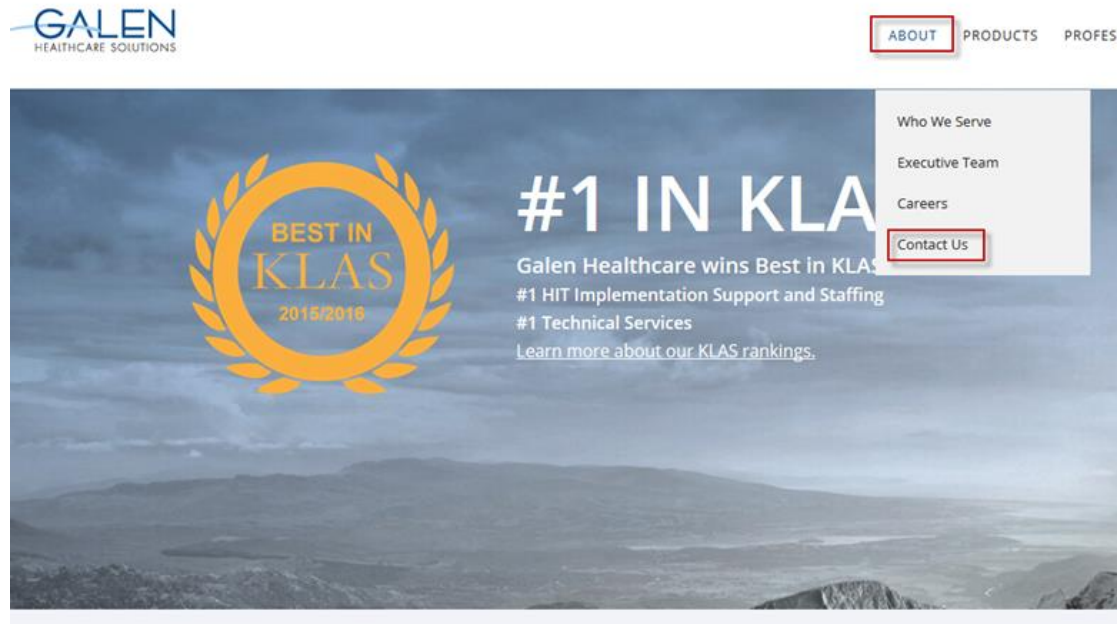 - Data Load
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QUESTIONS

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