Data Innovations

ENHANCING CLINICAL PATHOLOGY EFFICIENCY

The Role of Instrument Manager in Epic Beaker Integration with Third-Party Middleware Solutions

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The views and opinions expressed in this presentation are those of the speakers and do not necessarily reflect the views or positions of any entities they represent.

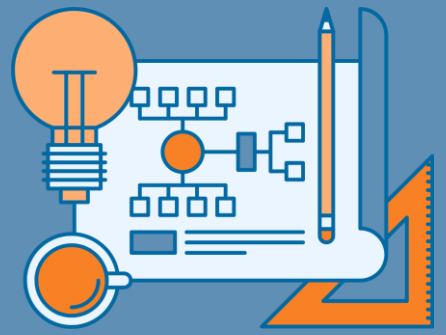
RON LUM
BEAKER ENTERPRISE ARCHITECT

- Data Innovations experience 13+ years at two separate organizations
- Currently at Scripps Health in San Diego
  - Scripps has been a Data Innovations customer since 2015 as a new Beaker installation
- History 33 years of experience in Laboratory Information Systems
  - Systems
    - Sperry Agnew – punch cards
    - Meditech – ALL disciplines
    - Cerner Classic
    - Lab Vision
    - Eclipsys Lab
    - Cerner Millenium
    - Beaker CP, Beaker AP
  - Committees
    - Partnership council Information Services – Chair
    - Point of Care
    - PACS
  - Technical
    - Business Cases
    - SBAR
    - Written RFP for LIS systems

QUESTIONS TO CONSIDER

- How do you engage the user community to be better stewards of the software they select?
- How do you engage the Instrument vendor community to work together with each other to benefit the clients?

KEY DEFINITIONS/CONCEPTS



- **INSTRUMENT MANAGER**
  - Lab-wide vendor-neutral middleware provided by Data Innovations
- **THIRD PARTY MIDDLEWARE**
  - Middleware provided by the instrument vendor outside of the Beaker/Instrument Manager relationship

THIRD PARTY MIDDLEWARE

WHAT DOES IT DO?

- Provides communication between
    - Beaker
    - Robotics / Track
    - Instrumentation
- Can create processes / rules to managed specimens (Beaker Functionality)
    - Specimen Routing
    - Critical
    - Delta checks
    - Processing errors
    - Quality Control
    - Downtime reporting
    - Specimen Analytics

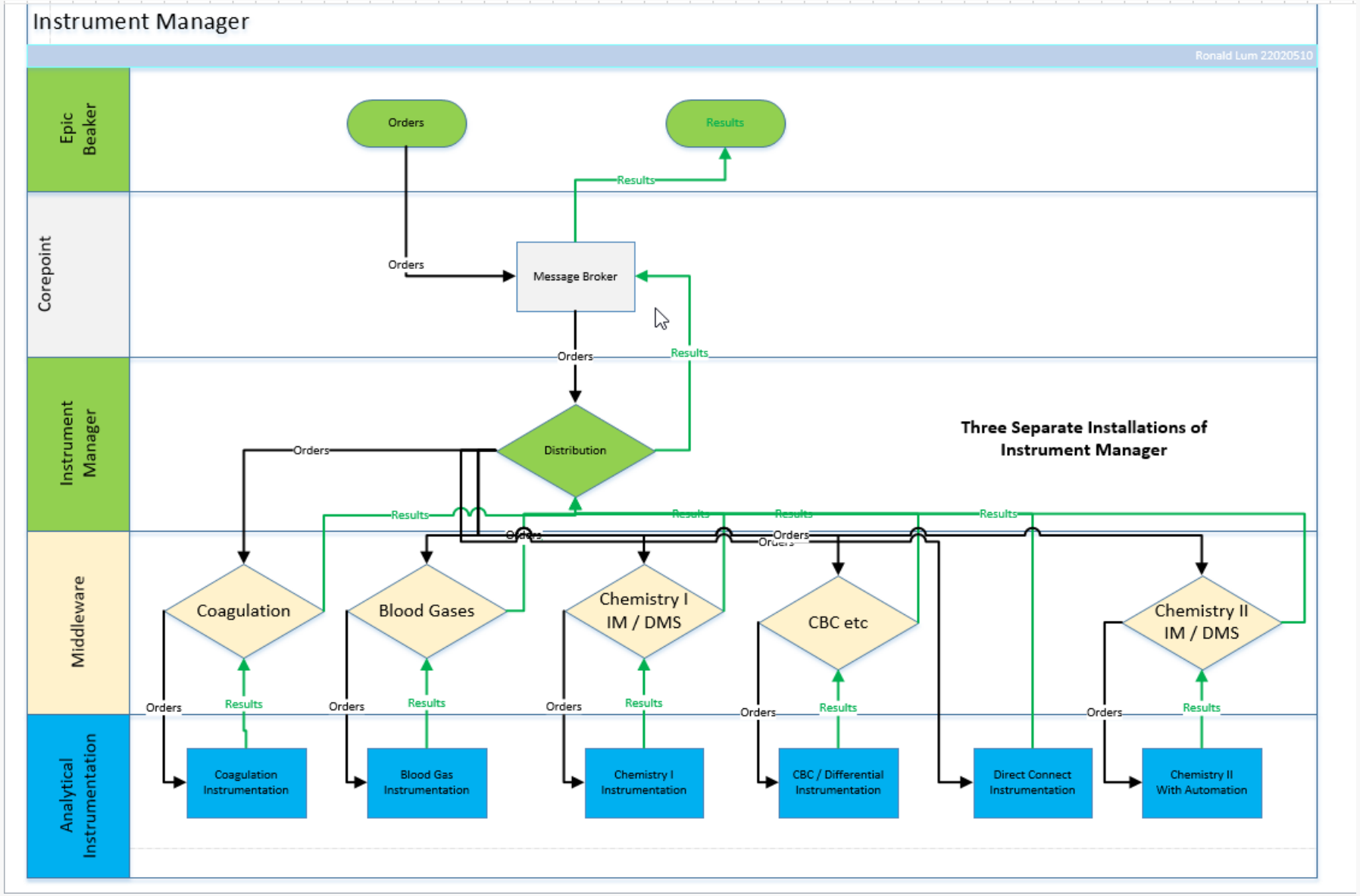
THIRD PARTY MIDDLEWARE

- Can it replace the Laboratory Information System (Beaker)?
- At what cost?
- Is it user friendly?
- What added value does it provide?
- Does it provide the right fit for the organization?

HIGH LEVEL VIEW OF THE TECHNOLOGY AT SCRIPPS

- LIS: EPIC BEAKER
- INSTRUMENT CONNECTIVITY: INSTRUMENT MANAGER
  - IM modules – Pass Through
  - Upgrade to Version 9
    - Moving Averages
- THIRD-PARTY MIDDLEWARE:
  - CBC etc
  - Coagulation
  - Chemistry I
  - Blood Gases
  - Chemistry II

HIGH LEVEL VIEW OF THE TECHNOLOGY AT SCRIPPS



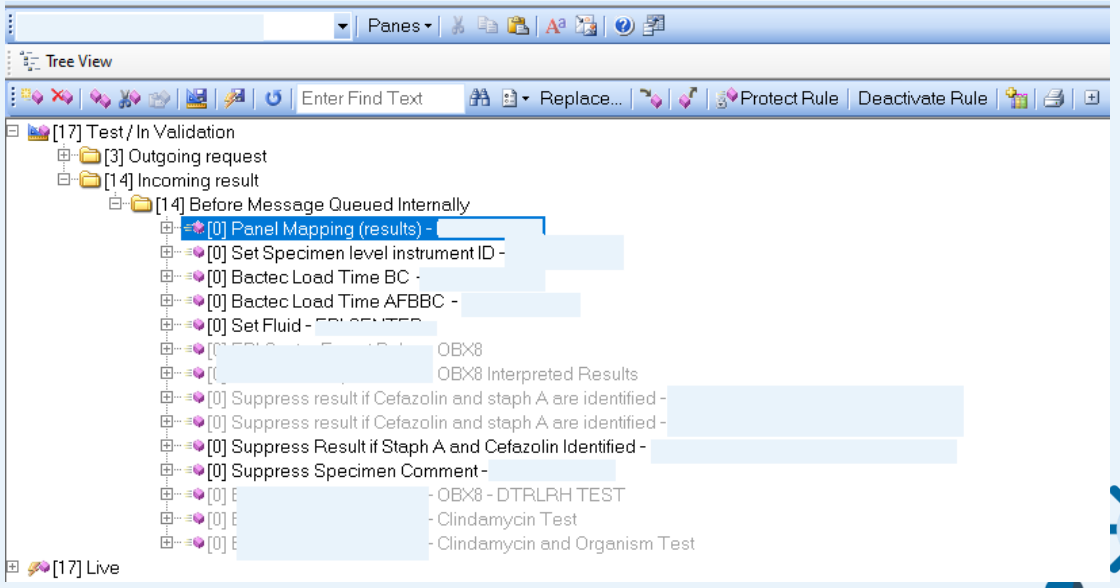
THE PROBLEM

WHEN CLINICAL LABS HAVE REDUNDANT TECHNICAL COMMUNICATION, THEY ARE:

- Spending money on redundant technology
- Adding complexity with more points of failure
- Utilizing inefficient processes and non-revenue generating activities

MICROBIOLOGY

- MICROBIOLOGY ORDERS AND RESULTS ARE PROCESSED THROUGH THE MIDDLEWARE
  - Blood Culture Incubation
  - Organism Identifications
  - Sensitivities



- Supplemented with Beaker functionality

COAGULATION

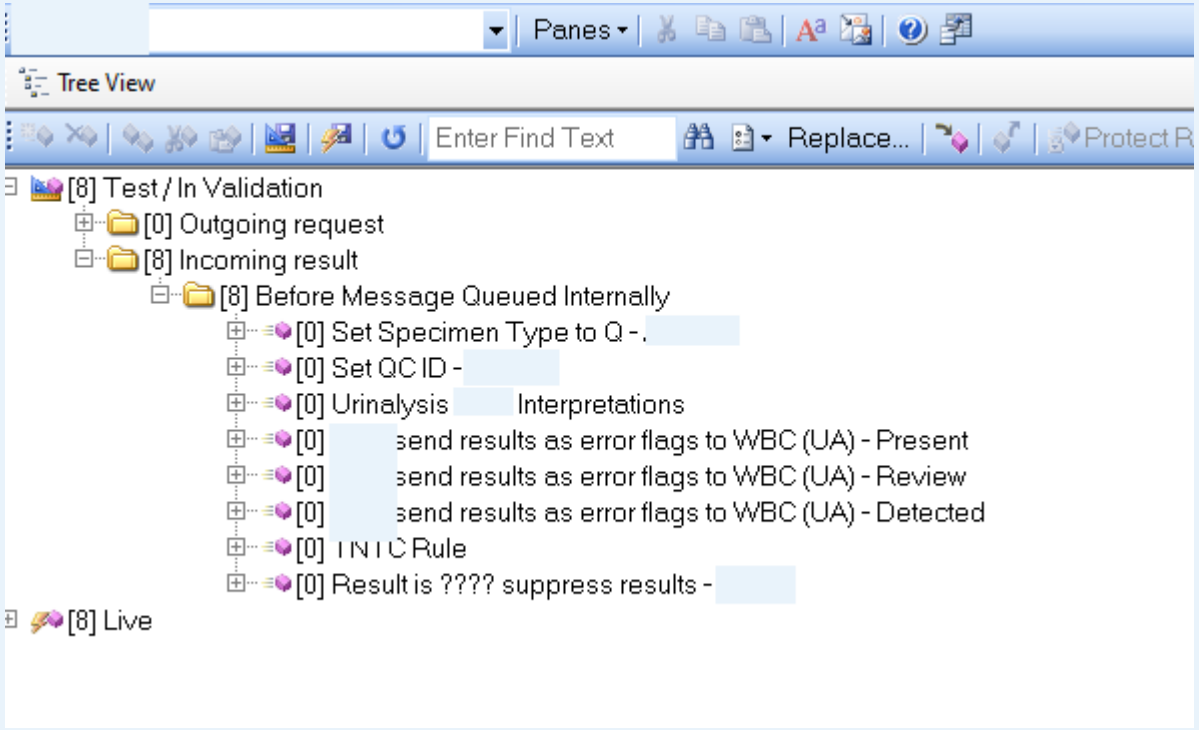
- WORKFLOW IS MANAGED IN THE LIS (BEAKER)
  - Leverage LIS functionality
    - Vendor proposed alternative solution.
  - Beaker - User community workflow
  - **Instrument Manager played an important role in accomplishing this task**
  - **User community no longer log into the application at all.**

URINALYSIS
MACROSCOPIC, MICROSCOPIC

- CONTAINS PROCESSING RULES WITHIN THE SOFTWARE.

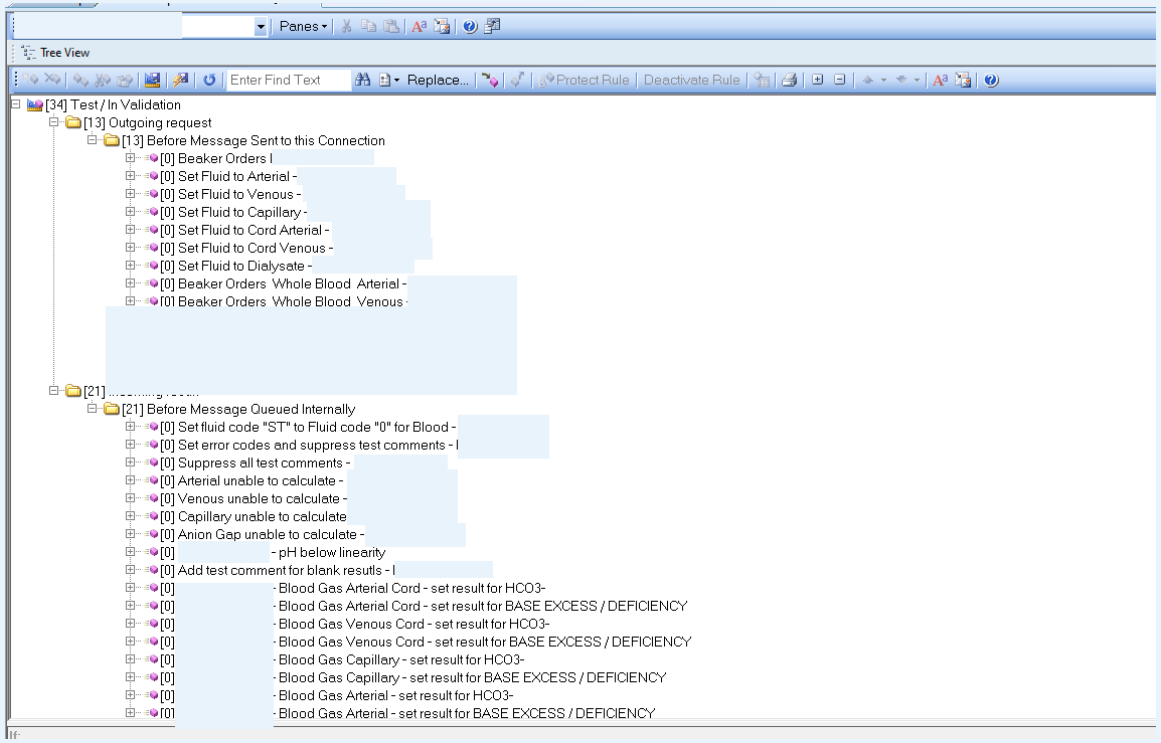
- PRIOR TO EPIC THE LAB STAFF WORKED WITHIN THE MIDDLEWARE TO RELEASE RESULTS TO SUNQUEST
  - **Workflow was not user friendly with low acceptance by the lab**

- WITH BEAKER/IM ALL RULES AND FUNCTIONALITY ARE TRANSFERRED TO EPIC.
  - Maintaining same functionality with greater user acceptance.
  - **Instrument Manager Rules**



BLOOD GASSES

- SOLICITED WORKFLOW USING SPECIMEN ORDERS WITH AUTO –RECEIVE
- WORKFLOW IS MANAGED IN THE LIS (BEAKER)
- LEVERAGE LIS FUNCTIONALITY
  - Vendor propose alternant solution
  - Beaker - User community workflow
  - **Instrument Manager played an important role in accomplishing this task through rules and conditions to meet the LIS requirements and getting the results to the patient's chart in a timely fashion.**

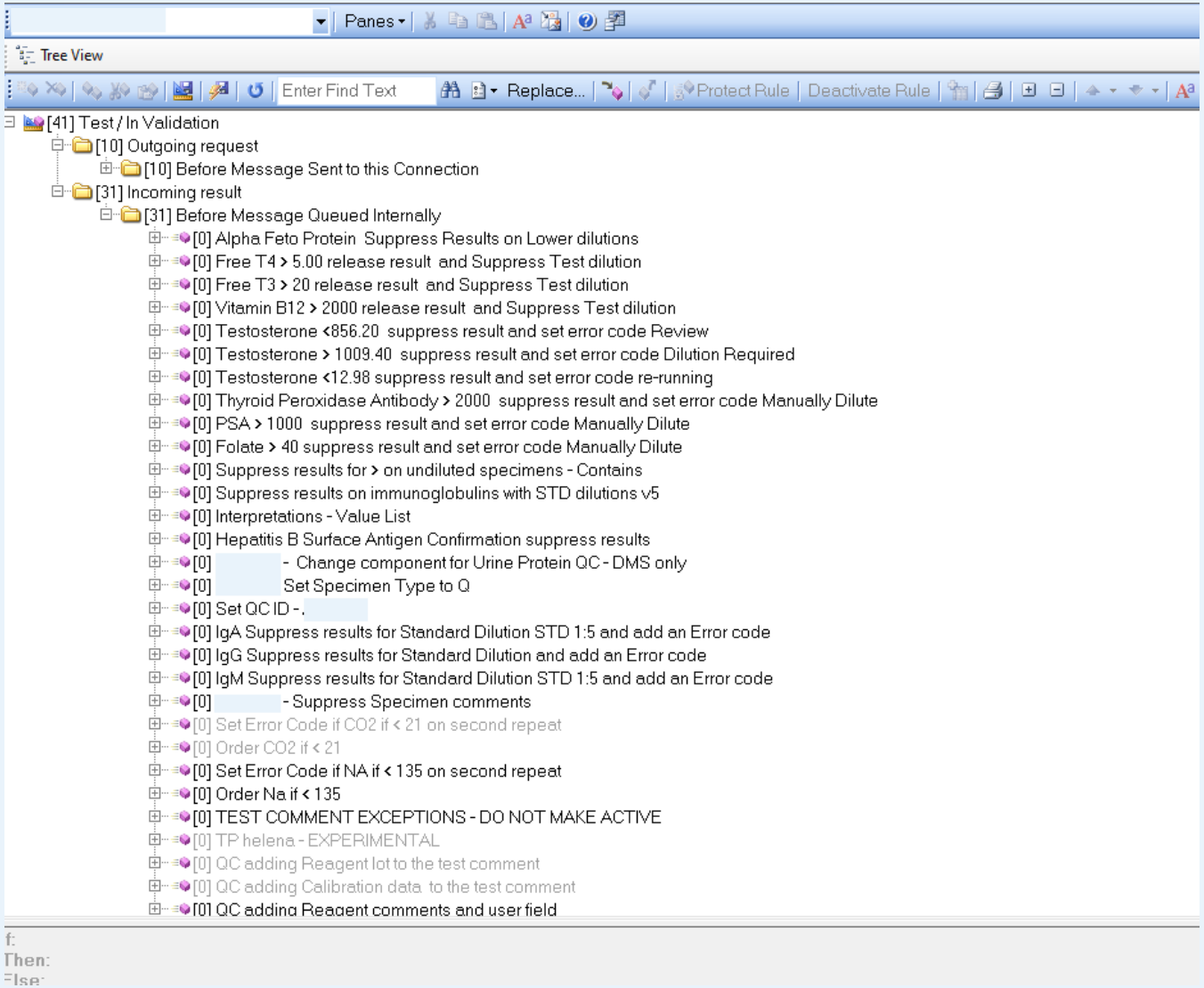


CHEMISTRY I

- INSTRUMENT MANGER TO INSTRUMENT MANAGER CONNECTION
  - ORDERS AND RESULTS ARE PROCESSED WITH SPECIMEN ROUTING
    - Direct connections for 2 Instruments
      - Chemistry modules connect to Chemistry I Instrument Manager
    - Automation DMS
      - 4 Instruments
      - Scripps Instrument Manager / Chemistry I Instrument Manager (Governance)
        - Results are suppressed if analytical conditions results fail
        - Advanced rules for repeats, error codes, comments
- WORKFLOW IS MANAGED IN THE LIS (BEAKER)
- LEVERAGE LIS FUNCTIONALITY
      - Vendor proposed alternative solution
    - Beaker - User community workflow
    - Instrument Manager played an important role in accomplishing this task

CHEMISTRY I

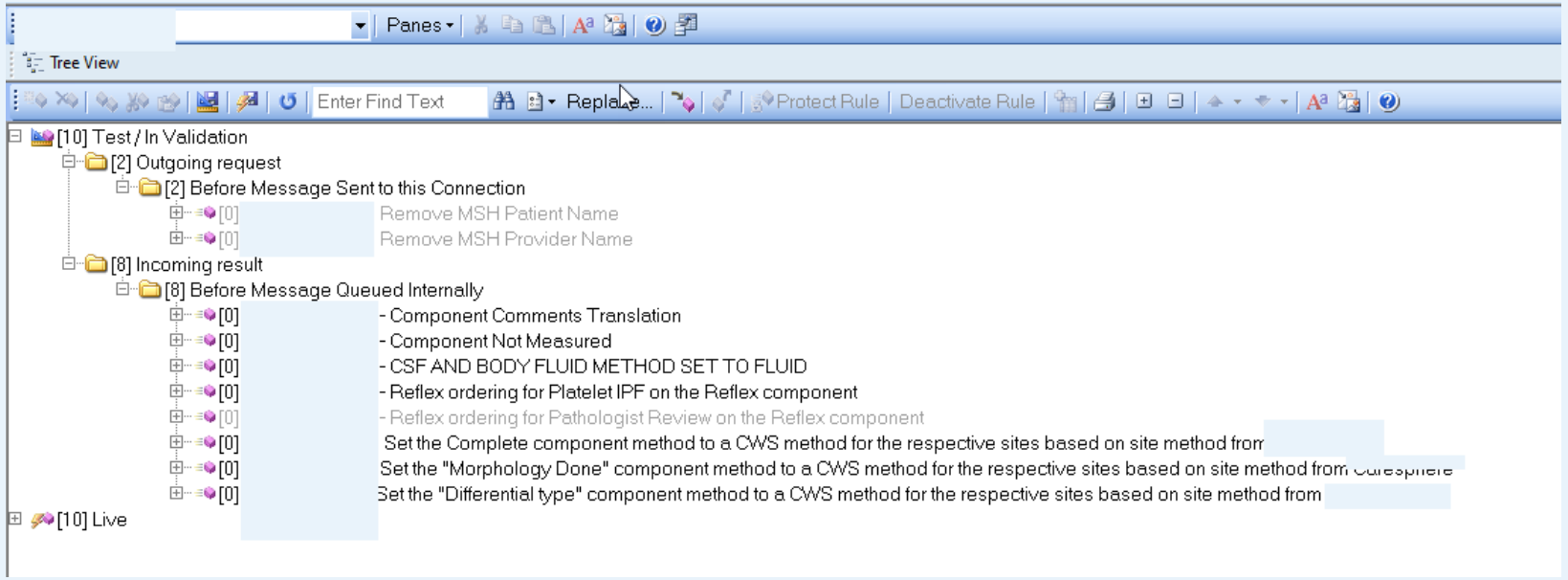
Chemistry I



HEMATOLOGY

- WORKFLOW IS MANAGED IN THIRD PARTY APPLICATION
- THE ONLY APPLICATION DEPLOYED BY SCRIPPS LABORATORY WHERE THE CLINICAL LABORATORY SCIENTIST (CLS) DOES NOT OPERATE DIRECTLY IN EPIC BEAKER.
- INTERFACE ERRORS HAVE BEEN IDENTIFIED IN THE INTEGRATION WITH EPIC. .

  Follow up processes and non-revenue generating activities



SOLUTION

- **INSTRUMENT MANAGER'S BEAKER DRIVER IS A POWERFUL TOOL**
- **WRITING RULES IN INSTRUMENT MANAGER TO BRING TOGETHER THE DATA FROM DISPARATE SYSTEMS**
  - Leveraging results messages as released from the instrument

HISTORICALLY

- Legacy LIS interface drivers had limited functionality
- Instrumentation had limited reporting parameters

CURRENT

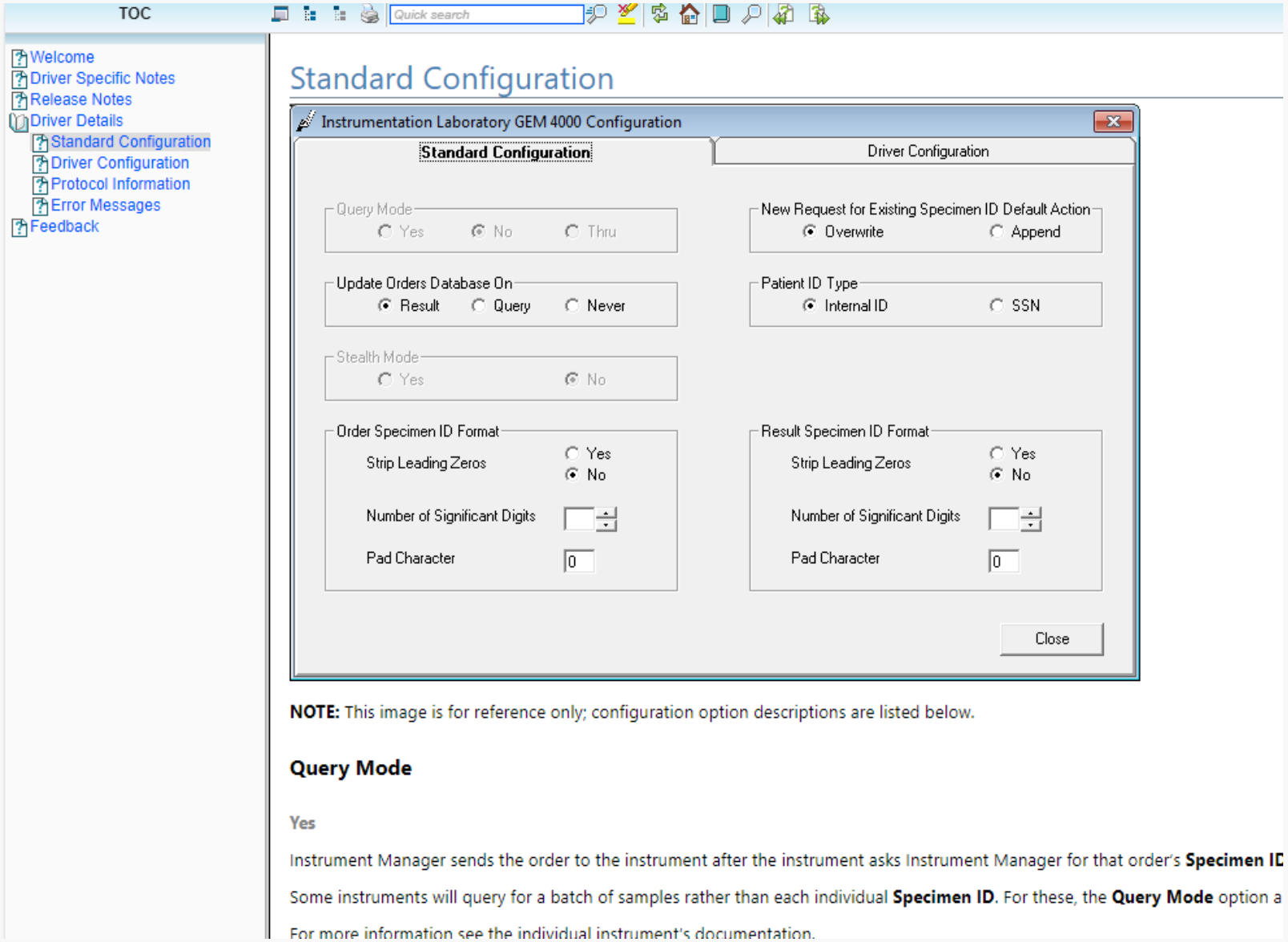
- Instrumentation has come a long way from just releasing a numeric result.
- More complex data is released by the instrumentation which can be captured and parsed out enabling the administrator to create complex rules to supplement the LIS and **Autoverification**
- Keys
  - Error codes
  - Dilutions
  - Calibrations
  - Reagents etc

INSTRUMENT MANAGER
DATA INNOVATIONS

- IF THE INSTRUMENT CAN SEND IT, INSTRUMENT MANAGER CAN CAPTURE IT.

- **THIS IS WHERE THE STRENGTH OF INSTRUMENT MANAGER COMES INTO PLAY AND ALLOWS US AS CLIENTS TO MINIMIZE THE USE OF MIDDLEWARE SOLUTIONS.**

SOLUTION


TOC
Quick search
Welcome
Driver Specific Notes
Release Notes
Driver Details
Standard Configuration
Driver Configuration
Protocol Information
Error Messages
Feedback
Standard Configuration
Instrumentation Laboratory GEM 4000 Configuration
Standard Configuration
Driver Configuration
Query Mode
Yes
No
Thru
New Request for Existing Specimen ID Default Action
Overwrite
Append
Update Orders Database On
Result
Query
Never
Patient ID Type
Internal ID
SSN
Stealth Mode
Yes
No
Order Specimen ID Format
Strip Leading Zeros
Yes
No
Number of Significant Digits
Pad Character
0
Result Specimen ID Format
Strip Leading Zeros
Yes
No
Number of Significant Digits
Pad Character
0
Close
NOTE: This image is for reference only; configuration option descriptions are listed below.
Query Mode
Yes
Instrument Manager sends the order to the instrument after the instrument asks Instrument Manager for that order's Specimen ID
Some instruments will query for a batch of samples rather than each individual Specimen ID. For these, the Query Mode option a
For more information see the individual instrument's documentation.

SOLUTION

Test Data:
Test Code = '1534098'
Result = '139'
Units = 'mmol/L'
Error Code(s) = 'Hef0,Ief0,Tef0,ef0'
Test Dilution = '1.0'
Result Date/Time = '3/31/2024 12:06:41 PM'
Result Status = 'V'
Reference Range = '-'
Test Code Sub ID = '1230100076'
Test Instrument ID = 'MCHA1'
Test Name = 'Na+'
Error Name(s) = 'Hef0,Ief0,Tef0,ef0'
Reagent Lot = '42356180'
Reagent Shelf Expiration Date/Time = '4/9/2024 10:08:02 AM'
Reagent Load Date/Time = '3/30/2024 10:08:02 AM'
Electrolyte Reference Fluid Lot = 'R1953'
Wash Fluid Lot = 'K1974'
Calibration Date/Time = '2/6/2024 10:58:10 AM'
Calibration Status = 'N'
Result Started Date/Time = '3/31/2024 12:03:20 PM'
Test Patient Reference = '4528893'
Test Purge Date = '3/31/2024'
Test Requested Date/Time = '3/31/2024 11:53:20 AM'
Test Requested Date = '3/31/2024'
Test Object Archive Object ID = '27010540||10'
Generation Number = '35'
Test First Query to IM Date/Time = '3/31/2024 12:03:36 PM'
Test Last Query to IM Date/Time = '3/31/2024 12:03:36 PM'
IM Result Date/Time = '3/31/2024 12:10:53 PM'
Test Collection Date/Time = '3/31/2024 11:38:09 AM'
Date/Time used for Previous Patient Results = '3/31/2024 11:38:09 AM'

THE RESULTS

- What happens:
  - Utilize the KISS principle
  - Finding the best fit for the organization

- Create an understanding around:
  - A robust Laboratory Information System
    - LIS functionality
  - Integration between Beaker and Instrument Manager
  - Instrument Manager's potential
  - Instrumentation and or Third-Party vendor proposed solutions
  - Expectation and Goals of the Laboratory

THE RESULTS

- WHEN CLINICAL LABS USE ONE TRULY VENDOR-NEUTRAL MIDDLEWARE TO ELIMINATE TECHNOLOGICAL REDUNDANCIES, THEY CAN:
  - Save money on redundant technology
  - Save time with efficient processes and able to focus on revenue generating activities
  - Save time on training with standardization of technology and processes
  - Save on IT resources required to support multiple systems/applications
  - Leverage the LIS and EMR for future enhancements/improvements

MIDDLEWARE: FUTURE

- URINALYSIS PLATFORM WITH DIGITAL IMAGING FOR MICROSCOPIC EXAMINATIONS

- MICROBIOLOGY – LABORATORY AUTOMATION

- ORTHO DIAGNOSTICS
  - 3rd Instrument Manager with Robotics

- DIGITAL IMAGING
- AI

My experience with Data Innovations Instrument Manager has been exceptionally good. I think Instrument Manager is worth its weight in gold. It provides a lot of technical solutions that are above and beyond the basics. There are a lot of tools in IM that people are not always leveraging or understanding. I still don’t understand them all.

EXPANDING ON THE SOLUTION

- HOW DO YOU ENGAGE THE USER COMMUNITY TO BE BETTER STEWARDS OF THE SOFTWARE THEY SELECT?
  - It's important for clinical users to be educated and engaged with the health system's technical infrastructure – and the clinical needs to support patient care.

- HOW DO YOU ENGAGE THE INSTRUMENT VENDOR COMMUNITY TO WORK TOGETHER WITH EACH OTHER TO BENEFIT THE CLIENTS?
  - Make your voice heard with your vendors!
  - Implement the model
  - Customer feedback

QUESTIONS

What questions do you have?