Laboratory Autoverification

Kansas City VA Medical Center

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Problem Statement

- The Kansas City VA Medical Center performs over 2,000,000 laboratory tests annually. Prior to AV every result had to be individually reviewed by certified laboratory personnel and manually validated by keystroking initials in software before the information can be released to hospital clinicians (physicians and nurses).
- This labor-intensive system is ultimately unsustainable due to a number of critical constraints—
  - Insufficient and decreasing supply of Medical Technologists
  - Increasing demand for laboratory work caused by a growing & aging veteran population
  - Expanding laboratory test choices driven by technological advancements
  - Increasing regulatory requirements
  - On-going budgetary and cost containment pressures

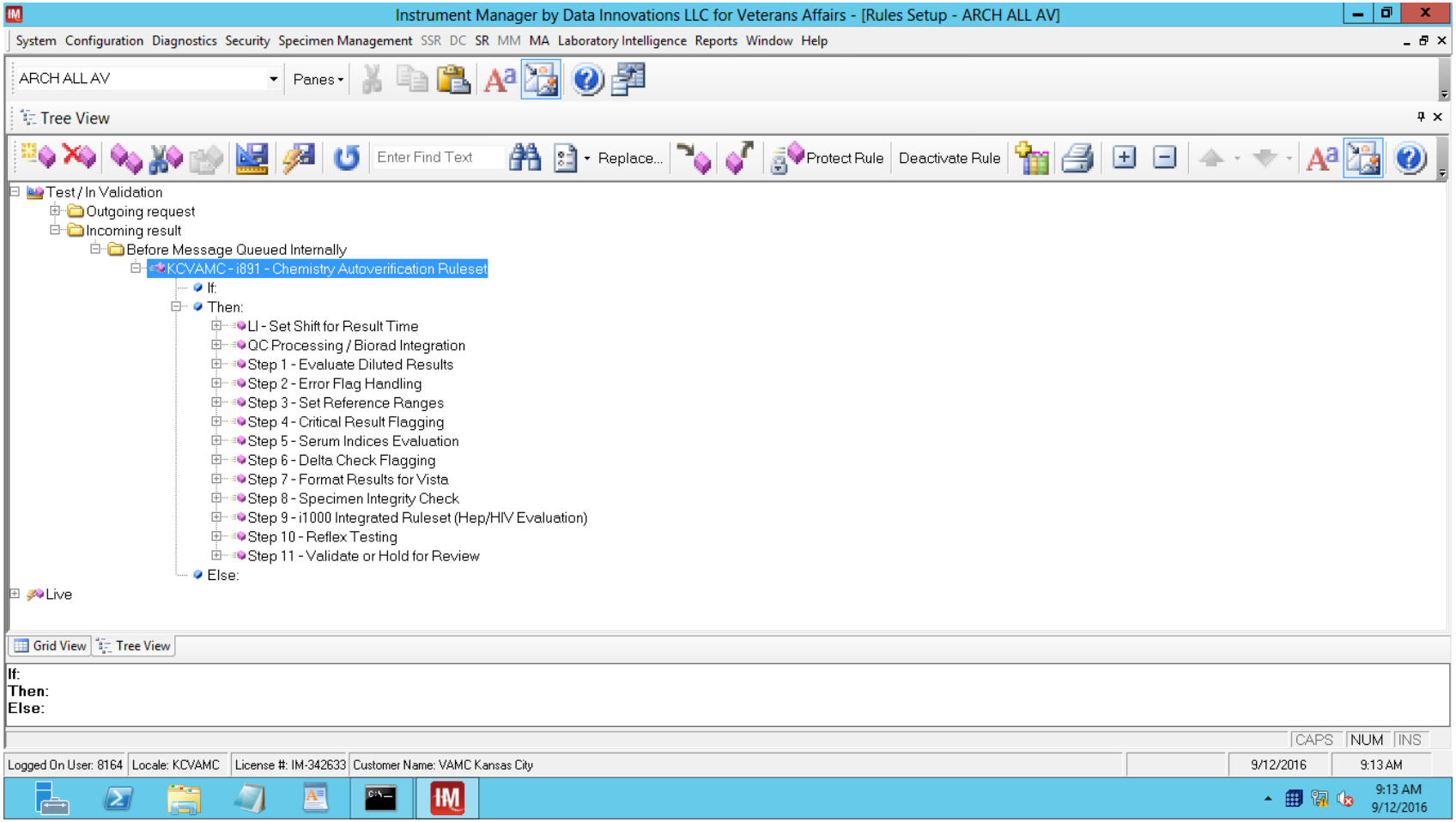
What is Auto-verification?

- Auto-verification uses software logic (rule algorithms) to define "normal" and "abnormal" result criteria. The software automatically approves and instantly routes normal results to the clinician.
- The exclusion of normal results from the medical technologist's workload, he or she can concentrate exclusively on abnormal results and provide diagnostics to the clinician more quickly.
- In both cases, results are released to clinicians with greater speed and efficiency, and with less potential for error.
- Example- 1200 MRSA tests performed per month
  - On average 80 tests are positive per month
  - 1120 negative results are keystroked out by a medical technologist
  - Utilizing auto-verification would allow 1120 results to pass directly to the patient's medical record

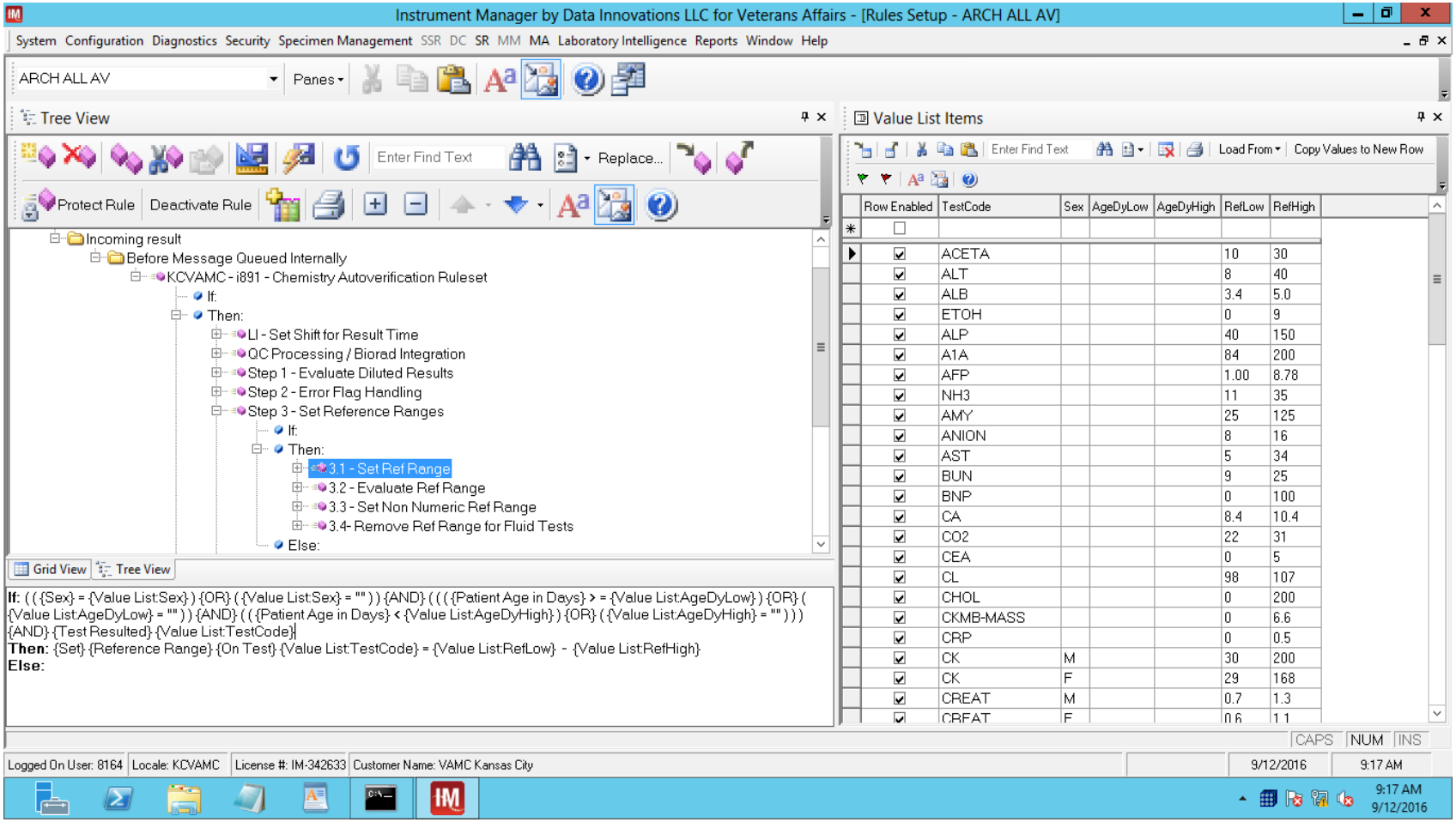
Advantages of Auto-verification

- Averaging 90% AV rate
- Decreased TAT
- Decreased error rate
- Decreased costs associated with paper and toner
- More tech time devoted to value-added projects such as CAP inspections, expanding test menu by bringing tests in house, inventory control, instrument evaluation prior to contracting etc.
- IM Workspace offers a more modern platform with the presentation of results that need review instead of pulling up each accession number one by one to determine if it is a stat, critical or need for a dilution or rerun.
- Offers drop downs, color coding and formatting of the workspace to view multiple instruments or departments on one workspace. This is convenient for off-tour shifts that are monitoring multiple instruments.

Rules based on Boolean Logic



Rule Examples



Select Process data in lab menu Option: EA Enter/verify data (auto instrument)

Select LOAD/WORK LIST NAME: IRIS-iQ200

Select Performing Laboratory: VA HEARTLAND - WEST, VISN 15// MO VAMC 589

Work Load Area: IRIS-iQ200//

Would you like to see the test list? No// NO

Do you wish to modify the test list? NO//

You have selected 38 tests to work with.

Do you want to review the data before and after you edit? YES//

Select one of the following:

1 Accession Number

2 Unique Identifier (UID)

Verify by: 1// Accession Number

Accession Date: TODAY// (AUG 01, 2017)

Accession NUMBER: 8// 18

ZZDUCK,GEORGE 000-00-XXXX
ORDER #: 1652600
Seq #: 1 Accession: UA 0801 18 Results received: Aug 01, 2017@09:01
UID: 2572130018 Last updated: Aug 01, 2017@09:01
Sample: URIN,RAND
Specimen: URINE
ZZDUCK,GEORGE SSN: 000-00-XXXX LOC: LAB
Pat Info: Sex: MALE Age: 71yr as of Aug 01, 2017
Provider: MATHUR,SHARAD C Voice pager:
Phone: 56148 Digital pager: 816-234-XXXX

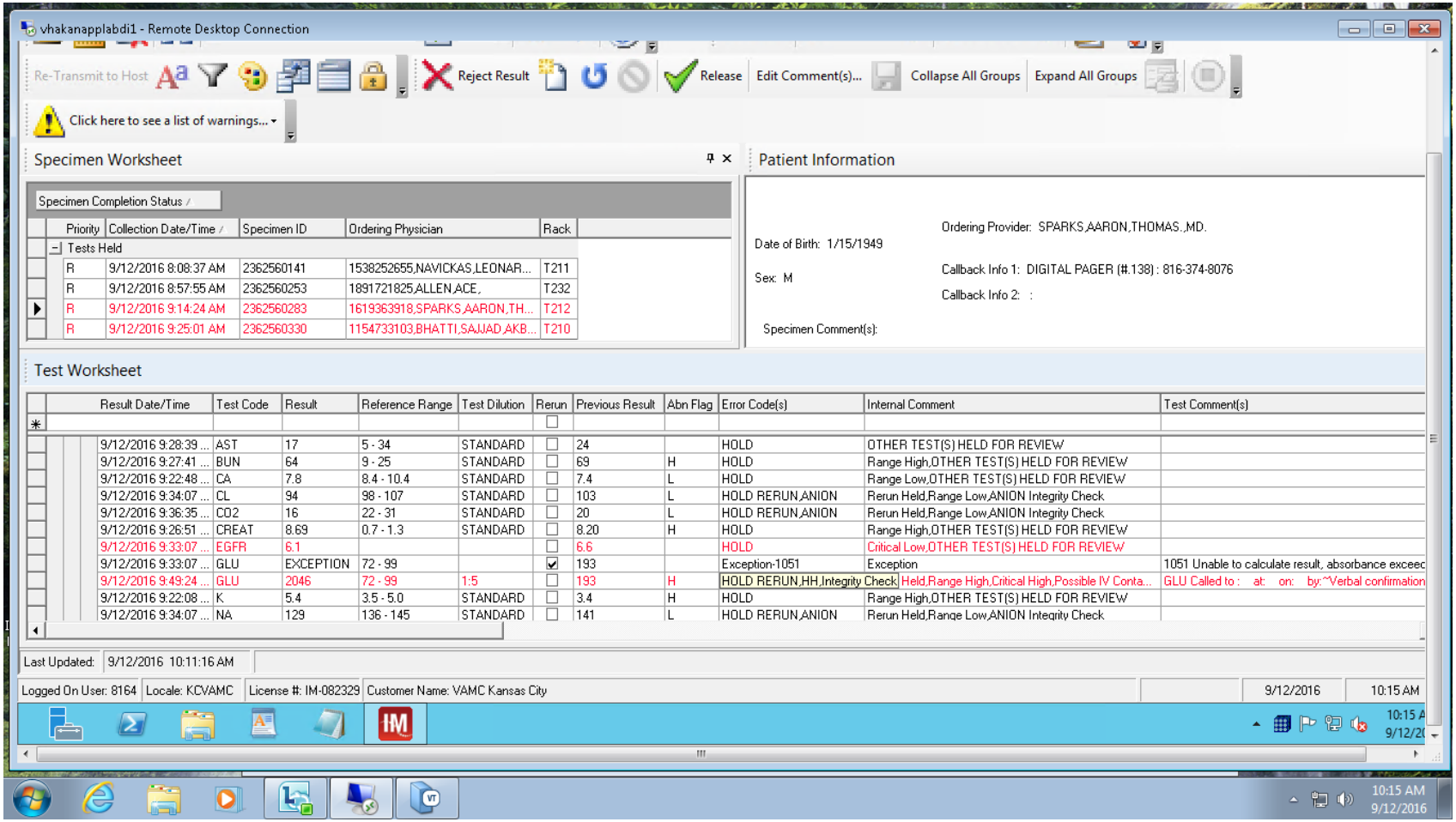
ACCESSION:	UA 0626 28	UA 0801 18 [2572130018]	
URINALYSIS	6/26 09:56d	8/1 08:53d	
URINE COLOR	Yellow	Yellow	
APPEARANCE,URINE	Clear	Clear	
URINE GLUCOSE	NEG	NEG	mg/dL
URINE BILIRUBIN	NEG	NEG	
URINE KETONES	NEG	NEG	mg/dl
SPECIFIC GRAVITY	1.018	1.027	
URINE BLOOD	Small	NEG	
URINE PH	6.0	5.0	
URINE PROTEIN	>=500	NEG	mg/dl
UROBILINOGEN	NORMAL	NORMAL	mg/dL
URINE NITRITE	NEG	NEG	
LEUKOCYTE ESTERASE	NEG	NEG	
*UR RBC	0-2		
*UR WBC	3-5		
URINE BACTERIA			
URINE BUDDING YEAST			

PRESS ANY KEY TO CONTINUE, '^' TO STOP

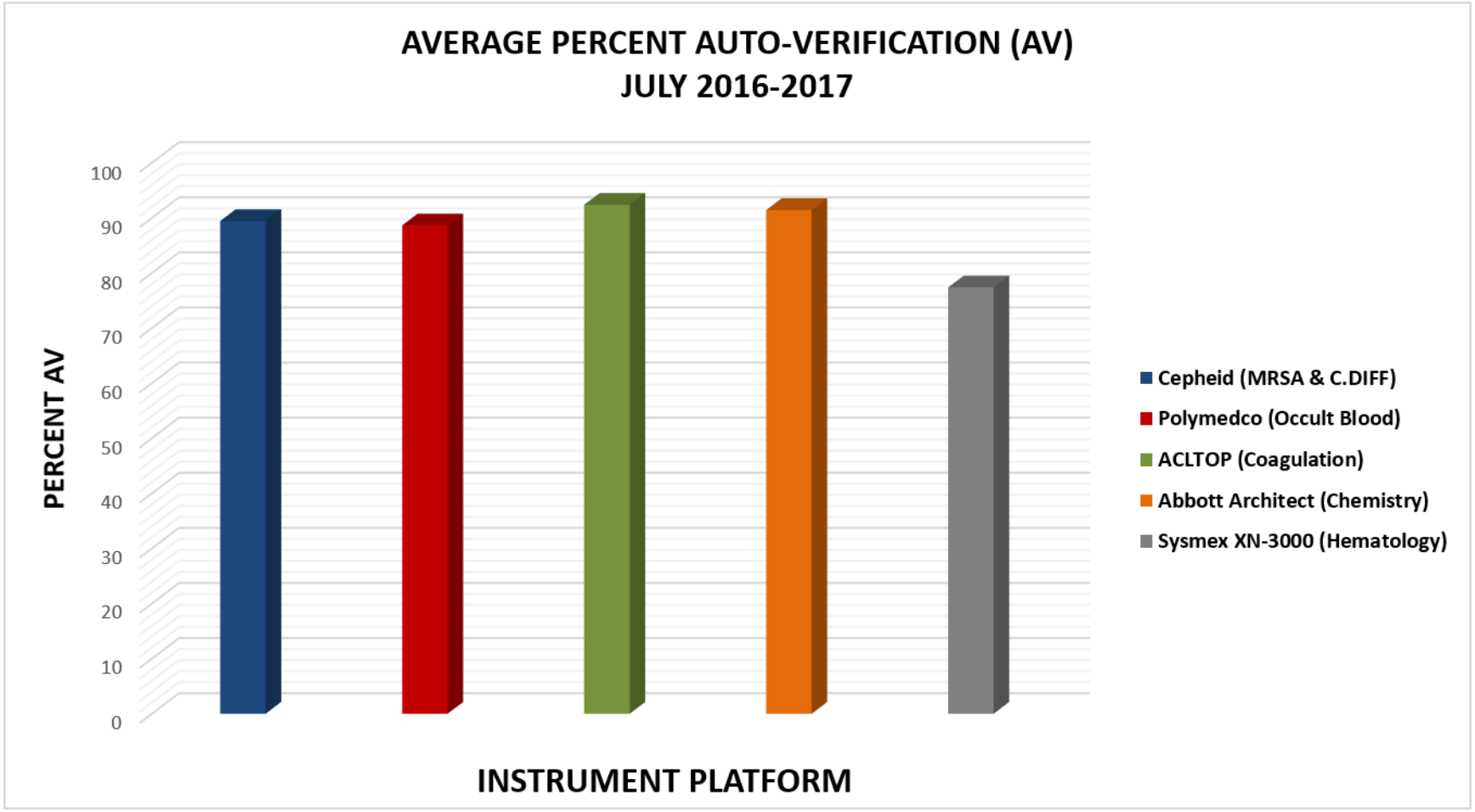
URINE HYPHAE YEAST
SQUAMOUS EPITHELIAL
*TRANS EPITHELIAL
URINE MUCUS
SPERM IN URINE
TRICHOMONAS
HYALINE CASTS
WBC CASTS
RBC CASTS
URINE GRANULAR CASTS
FATTY CASTS
WAXY CASTS
TRIPLE PHOS CRYSTALS
CA OXALATE CRYSTALS
URIC ACID CRYSTALS
*RENAL EPITHELIAL
URINE WBC CLUMP
OVAL FAT BODIES
FAT DROPLETS,URINE
URINE EPITH CELLS
UR AMORPHOUS

SELECT ('E' to Edit, 'C' for Comments, 'W' Workload):
Approve for release by entering your initials: LTW

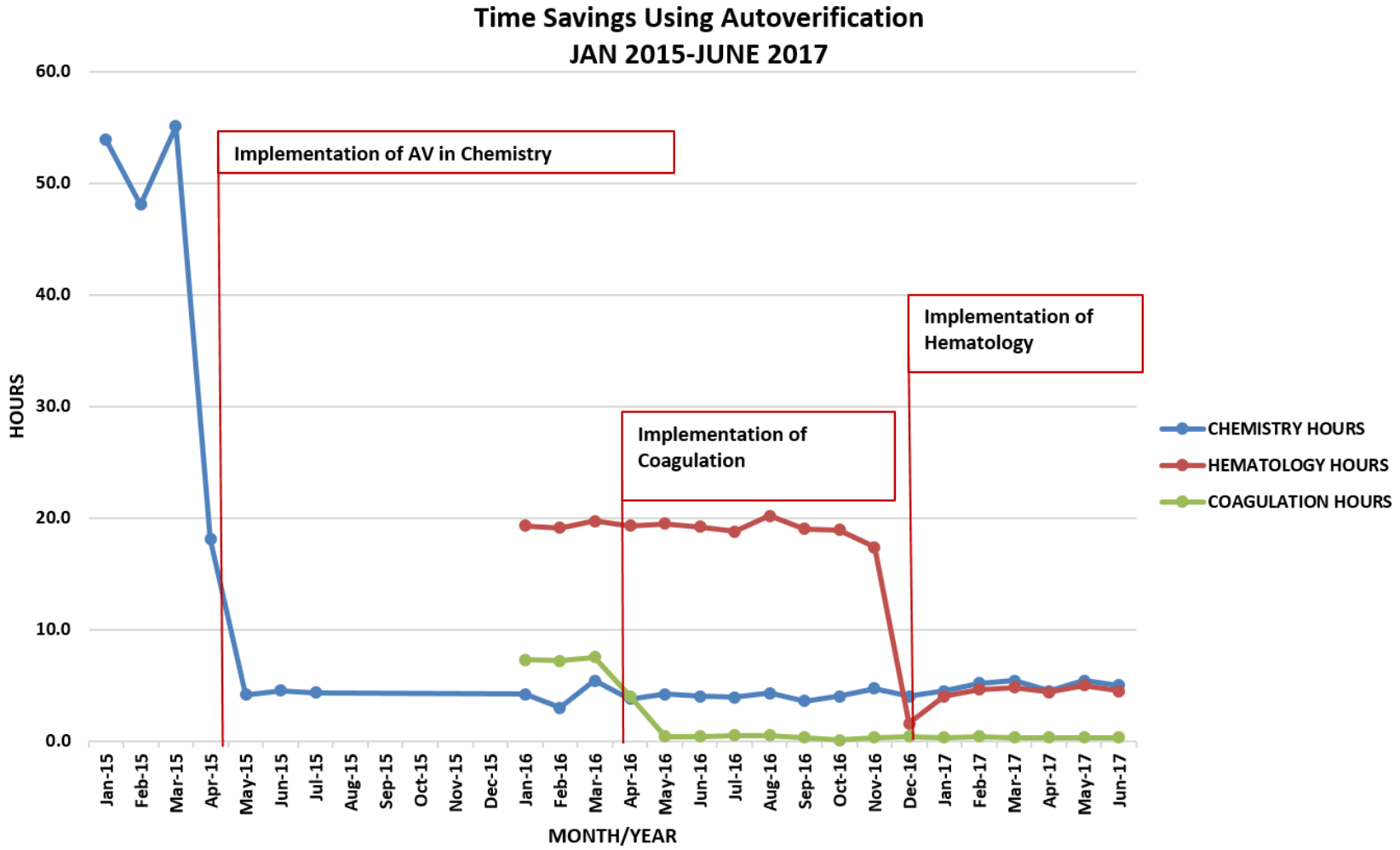
Example of an IM Workspace



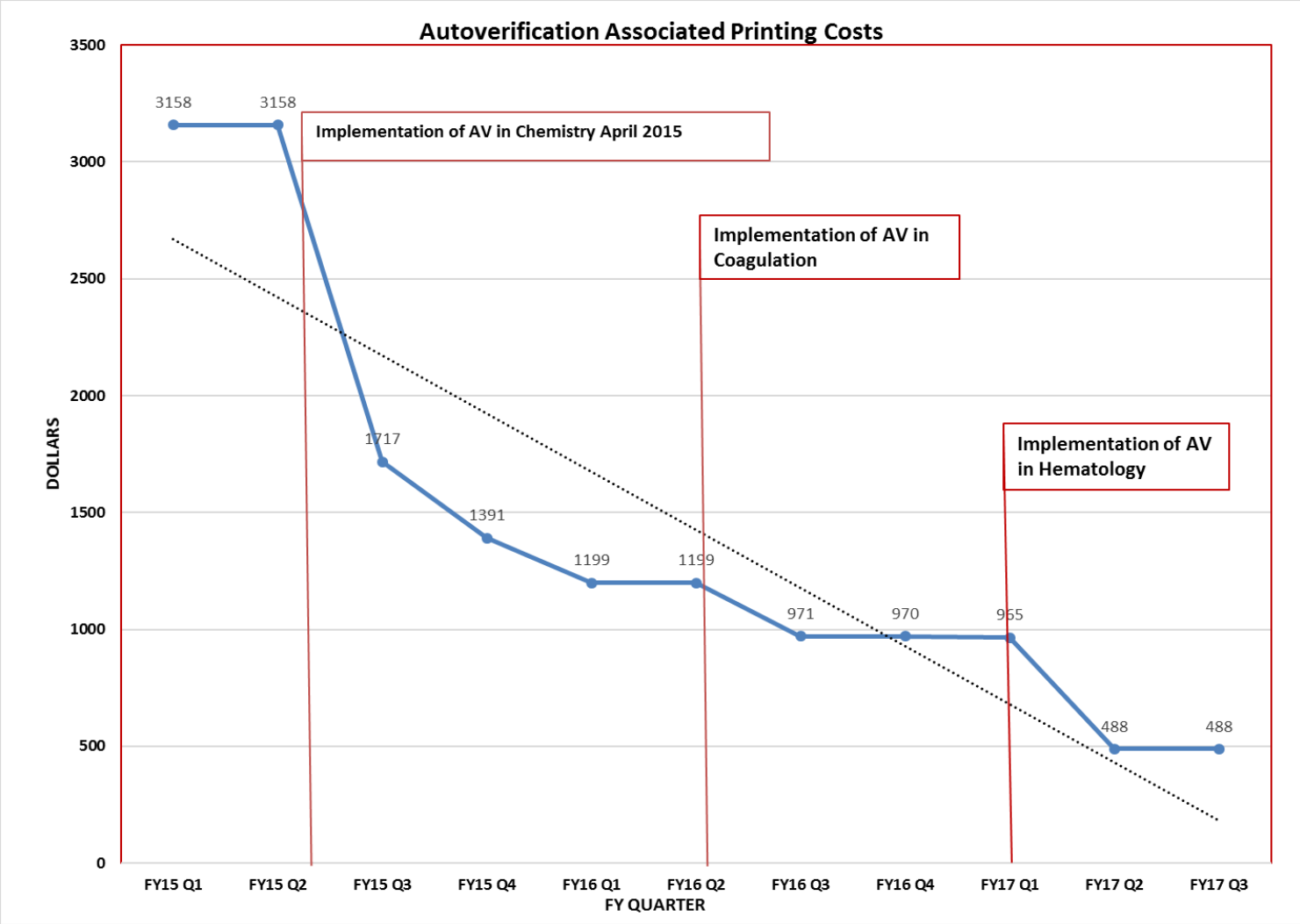
Operational Excellence- Achieve 70% Autoverification Rate



Cost Containment- Reduction in Time Spent Releasing Reports



Cost Containment- Supporting Executive Order 13101



Global sites that use Open Source VistA and now have the ability to use autoverification (AV) per Data Innovations

Global Sites

1) We estimate about 500 of the 1,700 have instrumentation and may be candidates for AV
2) The highlighted in yellow are the primary market for AV. The ones in green are secondary market and only a small % likely will use AV

Count of Facility Name	Column Labels									
Facility Type	USA	India	Jordan	N. Mariana Islands	Mexico	Egypt	Philippines	Germany	Pakistan	Grand Total
US Govt Clinic	808									808
Native American Clinic	334									334
Small Practice	272									272
US Govt Hospital	163									163
Native American Hospital	42									42
US State Govt Hospital	28									28
US Govt/VA Clinic	19						1			20
International (Non-US) Hospital		8	5		1	2	1		1	1	19
US Local Govt Hospital	10									10
Nursing Home	6									6
US Private Hospital	5									5
US State Govt Clinic	4									4
International (Non-US) Clinic			1		2					3
US Private Clinic	2									2
Native Hawaiian Clinic	2									2
US Local Govt Clinic	2									2
(blank)	1									1
Grand Total	1698	8	6		3	2	1	1	1	1	1721

We are estimating somewhere near 100 VistA, Open VistA and RPMS sites will be using some level of AV by 2020.

Conclusion & Questions

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