

# Automated Alert System to Improve Clinical Trial Workflow

Brian Hasselfeld<sup>1</sup>, Fred Prior<sup>2</sup>, Ralph Moulton<sup>2</sup>, Steve Moore<sup>2</sup>

<sup>1</sup>Vanderbilt University, <sup>2</sup>Dept. of Radiology Washington University in St. Louis, MO, USA

## ABSTRACT

Clinical trials in the Siteman Cancer Center at Washington University frequently rely on measurements made from clinical imaging studies. Trial coordinators lacked a convenient mechanism to track the progress of clinical procedures, often delaying the progress of the trial. As part of our Image Response Assessment Team (IRAT) program we have developed MARS: MIR Alert Request System. Coordinators register trial participants with MARS and select a list of significant events. MARS listens to all HL7 traffic emanating from the Radiology Information System and extracts only messages relating to identified study participants. These messages are logged in a database and the appropriate trial coordinator is alerted via e-mail or pager. The coordinator may then access relevant information via a secure web site. MARS also acts as an HL7 forwarding service so that selected radiology reports are routed to a dedicated RECIST measurement system.

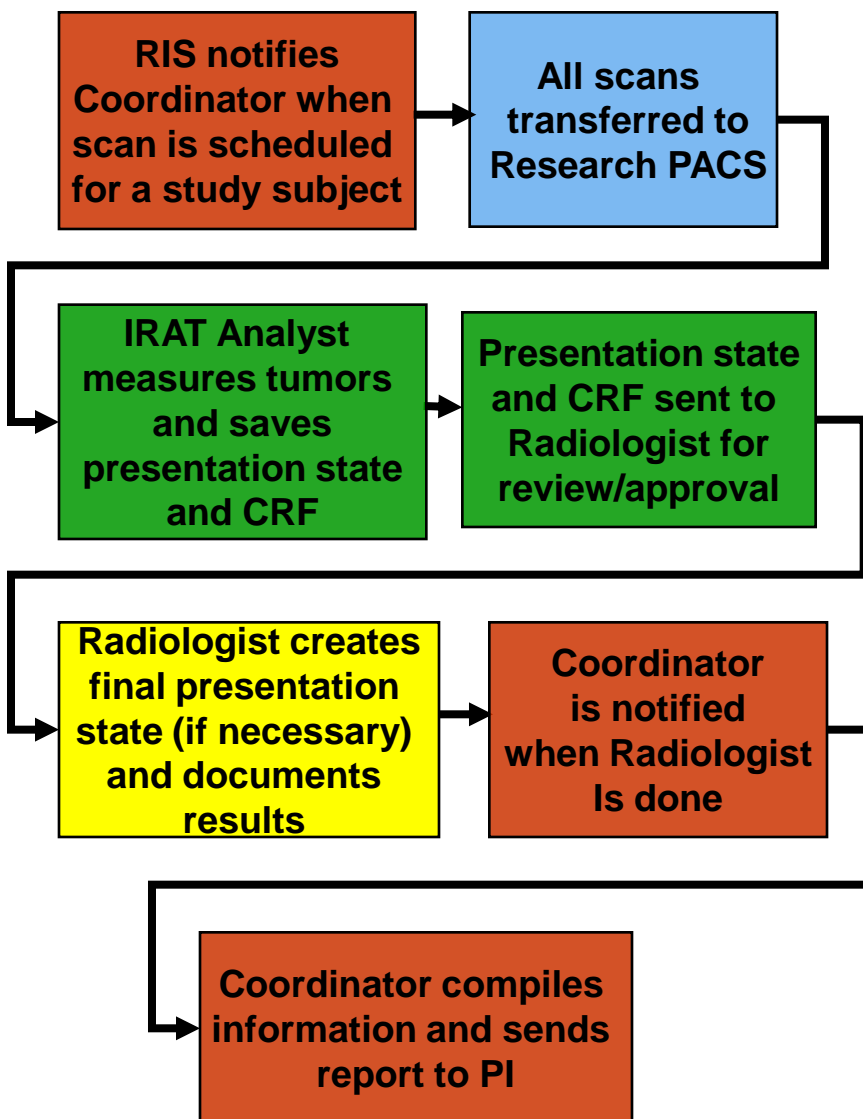
## MARS: MIR ALERT REQUEST SYSTEM

- MARS monitors HL7 messages from the BJH RIS for registered trial patients
  - MARS alerts trial coordinators when significant events occur
  - The coordinator can then log in via the web to get detailed information
  - MARS can also forward selected HL7 messages to the research PACS (e.g. reports)
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## REGISTER TRIAL COORDINATORS TO RECEIVE ALERTS

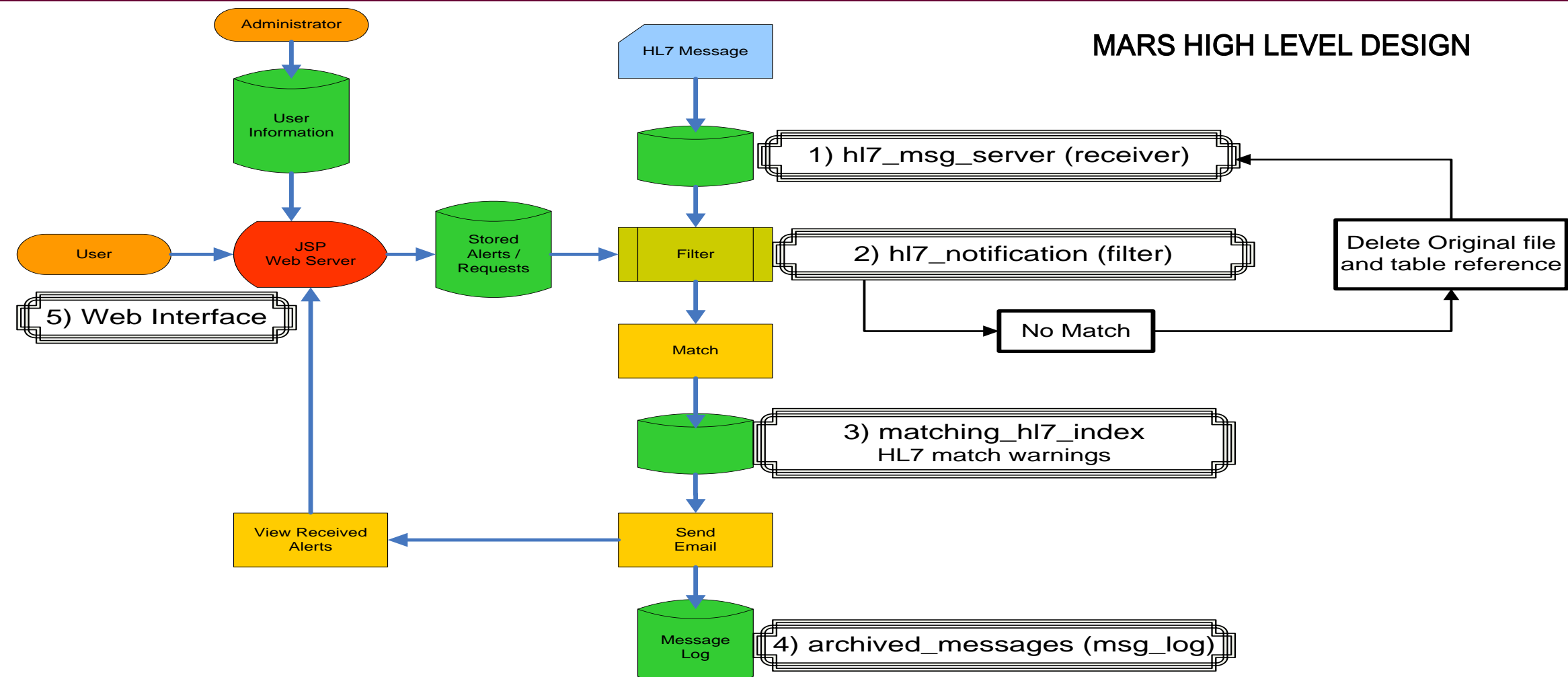
## REGISTER TRIAL PARTICIPANTS AND SELECT EVENTS

## TUMOR MEASUREMENT WORK FLOW



The IRAT has established an alternate workflow to facilitate collecting RECIST/WHO tumor measurements for Clinical Trials. This workflow is facilitated by the MIR Alert Request System.

## MARS HIGH LEVEL DESIGN



- hl7\_msg\_server: modified hl7\_rcvr to listen for incoming hl7 messages - saves hl7 message as a .txt file and inserts a reference to this file in a table, hl7\_file\_index, setting status to "in progress"
- hl7\_notification: filter for incoming messages stored by hl7\_msg\_server (1) - pulls all messages from table hl7\_file\_index with status of "in progress" and makes comparison between the hl7 message's patient demographic information and all stored alert requests' demographic information
- matching\_hl7\_index and hl7\_match\_warnings: two tables which store information to convey to the end user after a match is found by the filter (2) - if the filter finds there is a match between a received message and a stored notification request, it stores the hl7 message's demographic information into matching\_hl7\_index; if there is a demographic mismatch on any one of the four comparison categories (name, MPI, DOB, gender) a warning is stored in hl7\_match\_warnings
- archived\_messages and msg\_log: two tables which serve as a history log for the application - if an email is sent for a given hl7 message, the hl7 message is encoded into base64 and stored in archived\_messages; all recipients of that message are then stored in msg\_log
- JSP Web Interface: user interface for system interaction which requires authentication - users can make new alert request, view/update/delete current alert requests, view/delete received alerts, and update their user information including changing their password

## COMMUNICATING ALERTS

- Coordinators receive e-mail notification of an event
- A Secure Web Site allows them to access the details and properly manages Protected Health Information in compliance with Washington University Policies

## CONCLUSIONS

- Alternate Tumor Measurement Work Flow promises to improve the accuracy of RECIST and WHO based studies
- Secure, automated Alert management allows trial coordinators to proactively manage clinical trial workflow

## ACKNOWLEDGEMENT

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