IHE for emerging market
– Learning from integration experiences

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Agenda

- Medical Imaging in India
- Imaging Informatics Solution - Current Challenges
- Radiology Workflow - A Quick Recap
- Integration Challenges - Our Experiences
- Conclusions
Hospitals / Diagnostic Centers embracing digital technology.

# Eagerness to drive paperless practices
# Advanced Imaging Technologies and equipment are increasingly affordable
# Increasing adoption of EMR and PACS

Nasscom stats for healthcare in India (in Indian Rupees)
# Indian Radiologist workload 15 times more than USA Radiologist* - *Need to handle high volume of patients at a high throughput*

# Computer literacy of the data entry operators - *Requires custom error correction workflows*

# Solutions to be feature rich, cost effective and highly customized

*Reference [Indo-US Workshop on Large Scale Data Analytics and Intelligent Services]*
Impact (IHE compliant vendor):

# Integration with wide range of customized solutions which may not be up-to-date with standards

# Expectation of high tailoring, even if not standards compliant.
Radiology Workflow - A quick recap

IHE Scheduled Workflow (SWF) integrates the ordering, scheduling, imaging acquisition, storage and viewing activities associated with radiology exams.

Integration challenges:
- Order Placing
- DMWL
- MPPS
- Reporting
HIS places an imaging order to RIS through HL7 – ORM*

**Benefits:**

- Patient demographics / order entry at single place
- Effort for maintaining and searching of patient files/ folders reduced

**Challenges:**

- Legacy HIS not compliant to HL7 standards.
- Varied implementations of HL7 versions
- Many customizations required for integration

* HL7 v 2.3
Modality Work List (MWL)

Modality queries for work list orders from RIS.

**Benefits:**

# Seamless data flow to Modality from order entry
# Hardcopy Order Requisition forms not required

**Challenges:**

# In India, many patients not aware of their DOB → Mechanism to inform DOB as approximated
# Deployments have mix of Modalities with MWL and non-MWL → Custom solution required for paperless workflow
# Laterality of (paired) body-part not part of requested procedure information
Modality updates RIS with status of acquisition

Benefits:

# Automatic status updates. No manual follow-ups.
# Contrast dosage information → precise billing / inventory
# Exposure information → Regulatory / clinical data mining
# Unscheduled MPPS → Support Emergency Workflow

Contd.
Challenges:

# Estimated time to complete acquisition not available

# Order Reconciliation required at RIS for corrections done at Modality

# Many modalities do not support MPPS
  - Manual intervention to update order status is required
  - Emergency registration at RIS becomes mandatory step
Reporting Workflow helps to organize / schedule reporting tasks and to monitor progress.

**Benefits:**

# Search digitally stored report contents. Dispatch reports digitally.
# Ensures consistency and integrity of patient data

**Challenges:**

# Due to high volume, probability of erroneous data entry increases → expectation to handle this with minimal intervention
# Report recall and distribution due to amend /append of finalized report
# EMR/HIS expect report in varied formats – Encapsulated Data, String Data,...
Conclusions

- IHE could consider Workflow needs of Emerging Markets.
- The key factors for customization could be
  - Simplified workflow
  - Speed and automation
  - Reconciliation workflow
- India specific Connectathon forum:
  - Vendors get a common platform to integrate and test
  - Reduce integration challenges at deployment
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<td>By Phaneendra K Yalavarthy (IISc)</td>
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