# Multi-Modality Viewing on Ultrasound Imaging Device - An Experience Sharing

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Introduction: Multi-Modality (MM) viewing on an acquisition modality is the ability of the modality to import and display DICOM images from other modalities. In order to achieve this, the acquisition modality should enhance its DICOM functionalities, archiving capabilities and viewer to display MM images. Traditionally, a workstation is used to compare and review images from different modalities. Mobile acquisition stations will have in most cases no access to a review station close by. This means that a mobile acquisition modality having MM viewing capabilities can reduce the time spent on preparing for review and allowing for a quicker diagnosis.

Background

Workflows

Regular Workflow →
Alternate Workflow →
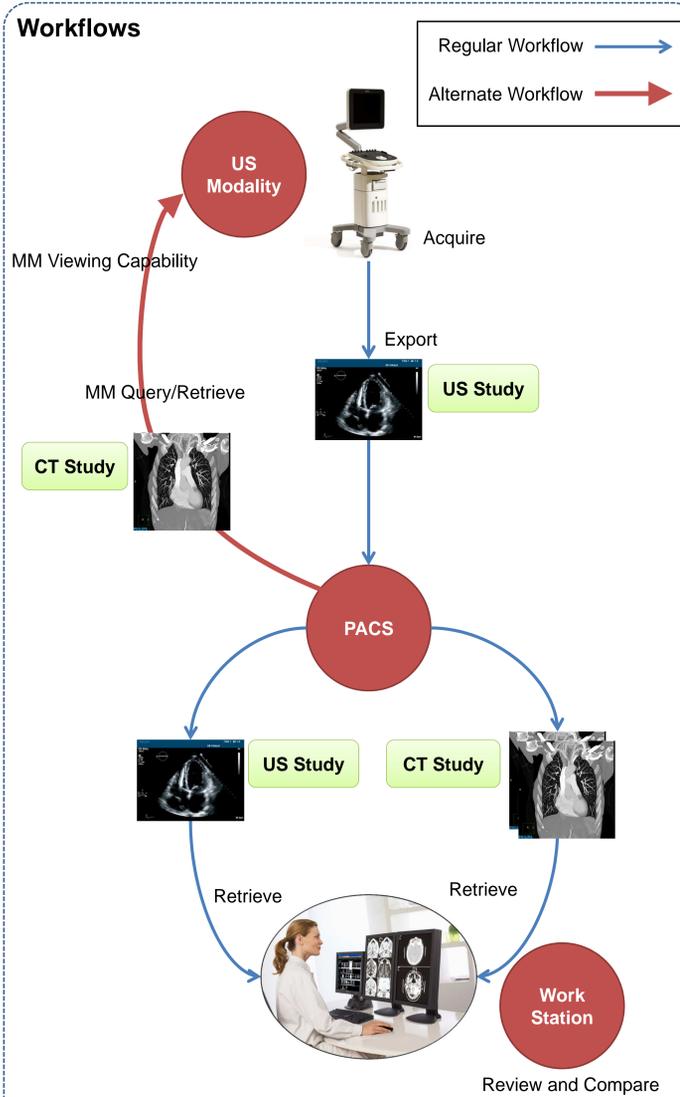
Clinicians sometimes need to refer/compare images from multiple modalities in order to diagnose. Ultrasound is a modality on which acquisition and image review can be done using the same system.

MM Viewing, combined with the power of an acquisition modality provides **enhanced diagnostic capabilities** to a clinician.

Solution

To enable reviewing MM images on Ultrasound, the necessary capabilities are supporting imports from the media and PACS and having a viewer capable of displaying the imported images at high quality. Also viewing layout can be designed to support specific clinical workflows.

Import of Study

Import from Media (USB/DVD)
DICOM import of MM examination from **media** is supported by enabling the system to support different DICOM image SOP (Service Object Pair) classes for CT, MR, PET, etc.

Retrieve over Network
- System uses DICOM query retrieve service by using **C-FIND** to get all different studies available in a PACS and displaying them to the user.

- System also provides **query filter** to help the user to narrow down to query fetch only interested examination(s) thus saving time and improving performance.

- Once user selects one or multiple studies to be imported, system uses **C-MOVE** command to import the study to the system. System is updated to store all modality studies.

Components of Multi-modality Viewing

Components of Multi-modality Viewing
- DICOM Functionalities
- Archiving Capabilities
- Image Viewer

Capabilities Enhanced
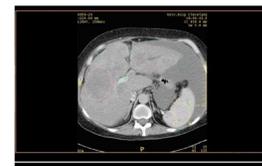- General Diagnosis
- Therapy Monitoring
- Intervention

Viewing

In a typical Ultrasound workflow, MM images can be viewed in following ways:
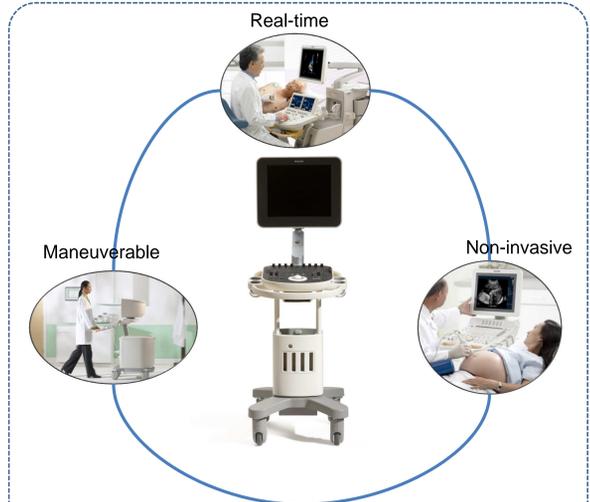
- Only MM image

- MM Image and historic image in split screen

- MM image and live image in split screen

Suitability

Real-time
Maneuverable
Non-invasive

Enabling MM capabilities is especially beneficial for Ultrasound because of its maneuverability, non-radiation scanning, less cost, ease of use for therapy monitoring compared to modalities such as CT that are normally used for primary diagnosis.

Challenges

- Adding support for various DICOM Image SOP classes means handling Modality specific attributes
- Scaling storage capabilities of the system to handle other modality DICOM images
- Enhancing viewing application to support display of MM images with a fixed geometry system

Conclusion

The combination of Ultrasound (real time scanning) and MM viewing, will directly impact the patient care cycle by significantly **reducing the time involved** in post-diagnosis, during the recovery phase of a patient, e.g., therapy monitoring.

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