Basic Image Review (BIR)

David Clunie – PixelMed
• “define the appropriate baseline functionality & behaviors for viewing software on CD”
• “defines baseline functions and user interface relevant to simple review of DICOM images”
• “potentially applicable to all Image Displays”
• “specific requirements that pertain to the use of Image Displays included on PDI media”
• “a named option for the PDI Profile”
BIR – Problem Statement

• Physician frustration:
  • viewers do not run successfully
  • viewers do not load the images successfully
  • the viewer loads too slowly
  • the viewer claims to be "not of diagnostic quality"
  • functions critical to review are missing from the viewer
  • viewers have unique user interfaces that do not provide obvious access to basic functions

• Impact
  • delayed care
  • inaccessible information
  • repeat examination and irradiation
  • poor use of valuable clinician time
BIR – Use cases

• Basic Viewer Option (PDI Profile - Media Creator)
  • physician viewing of media
  • operating Room viewing of media
  • patient viewing of media

• Basic Imaging Review Profile
  • viewing from PACS/VNA within the enterprise
  • viewing from PACS/VNA outside the enterprise
  • viewing from other enterprise
  • viewing from regional/national archive
  • viewing through EHR/PHR
BIR – Value Proposition

• Increase physician satisfaction
• Increase physician efficiency
• Reduce training burden
• Reduce technical support burden
• Reduce repeat studies
• Reduce delays & errors in patient care
BIR – Actors and Transactions

- Image Manager
- Image Archive
- Image Display

- Query Images [14]
- Retrieve Images [16]
BIR – Process Flow

Image Manager/
Image Archive

Query Images [14]
Retrieve Images [16]

Image Display

Read Media
Present Images to User

or

Present Images to User
BIR – Image Display – Behavior - I

- Display of grayscale and color images from any modality
- Cross-sectional modalities like CT, MR and PET
- Projection radiography modalities like CR, DX, XA and XRF
- Ultrasound and nuclear medicine
- Basic rendering of the images as encoded
- Without additional image processing
- No pseudo-coloring, MPR, volume rendering, fusion
BIR – Image Display – Behavior - II

- Visual navigation of series of single and multi-frame images using thumbnails
- Side-by-side comparison of at least two sets of images, whether they be multi-frame images, series from the same study, or different studies
- Synchronized scrolling, panning and zooming
- Annotation of laterality, orientation
- Spatial localization of cross-sectional images for anatomic reference
- Annotation of demographics, management and basic technique information
BIR – Image Display – Behavior - III

- Simple measurements of linear distance and angle as used by clinicians for change detection and treatment planning
- Cine capability to allow review of multi-frame images that involve cardiac motion (e.g., cardiac US, XA, CT or MR)

- NO ADDITIONAL FUNCTIONALITY PERMITTED
- OK to have a tool to select “advanced mode”
BIR – Standard User Interface Behavior

- Direction of mouse movement (e.g., windowing, scrolling)
- Mouse actions (left button click)
- Keyboard shortcuts
- Icons – “not intended to be used exactly with the bitmap illustrated … as long as they are recognizable as being the same symbol” – based on IEC 60878 symbols if possible
BIR - Conclusion

• BIR improves user experience for both CD/DVD viewers and “on-line” viewers
• Minimum set of features defined by expert panel of representative referring physicians
• Too much, too little or just right?
• Does not preclude vendor-specific added value through “advanced mode” but does require adherence to design principles and standard user interface requirements in “standard mode”
• Challenging where there is an installed base of viewers or existing “look and feel”