

THE DICOM 2013 INTERNATIONAL CONFERENCE & SEMINAR

March 14-16

Bangalore, India



Optimizing Export Image Quality

Shreelaxmi Bhat

Philips Healthcare

Technical Specialist

Bangalore, India

Co-Authors: Easwara Moorthy

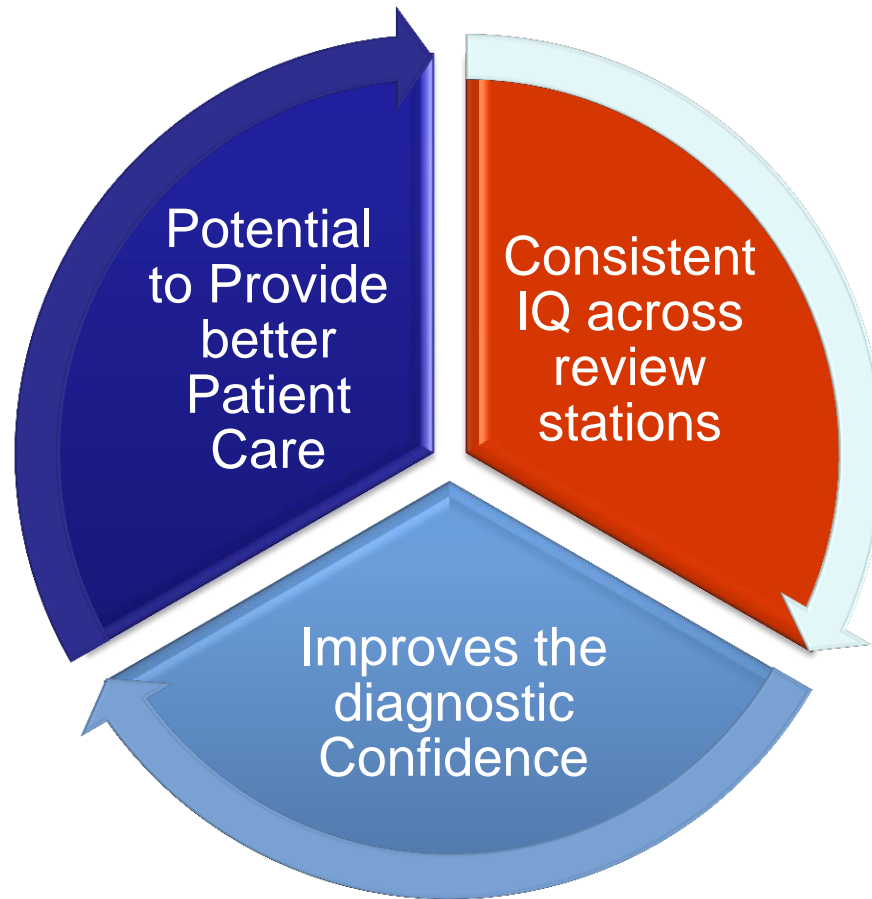
Philips Healthcare

Bangalore, India

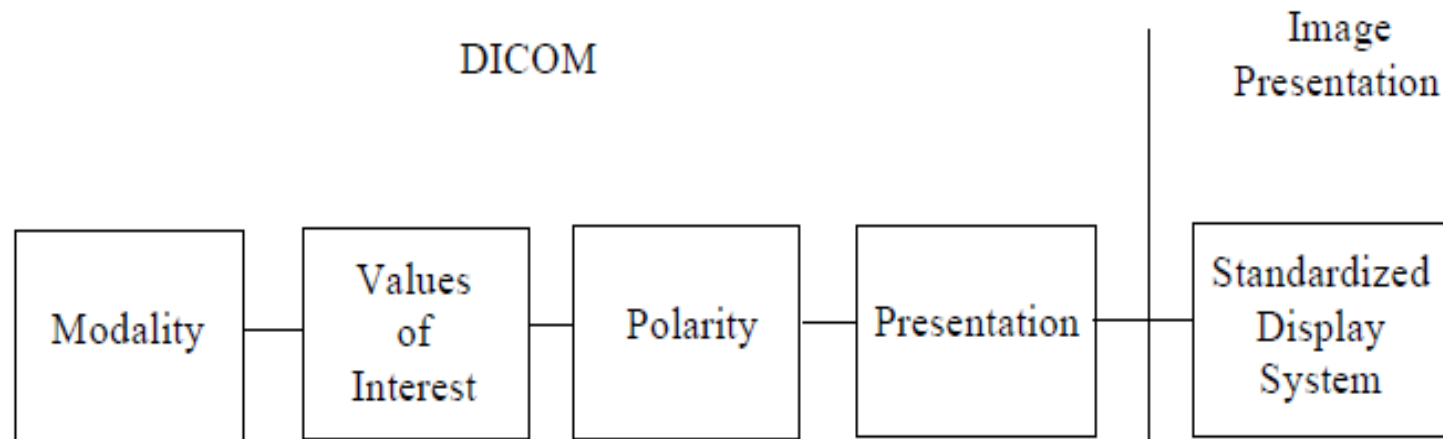
PHILIPS

Optimizing Export Image Quality

- Image Quality
- What is Grayscale Standard Display Function?
- Display Systems
- Solution - Export IQ Optimization
- Proposal - Workflow Enhancement
- How Export fits into the architecture
- An Analogy and Examples
- A substitute “Standard Display”
- Benefits, Conclusion
- References
- Contact info of Presenter



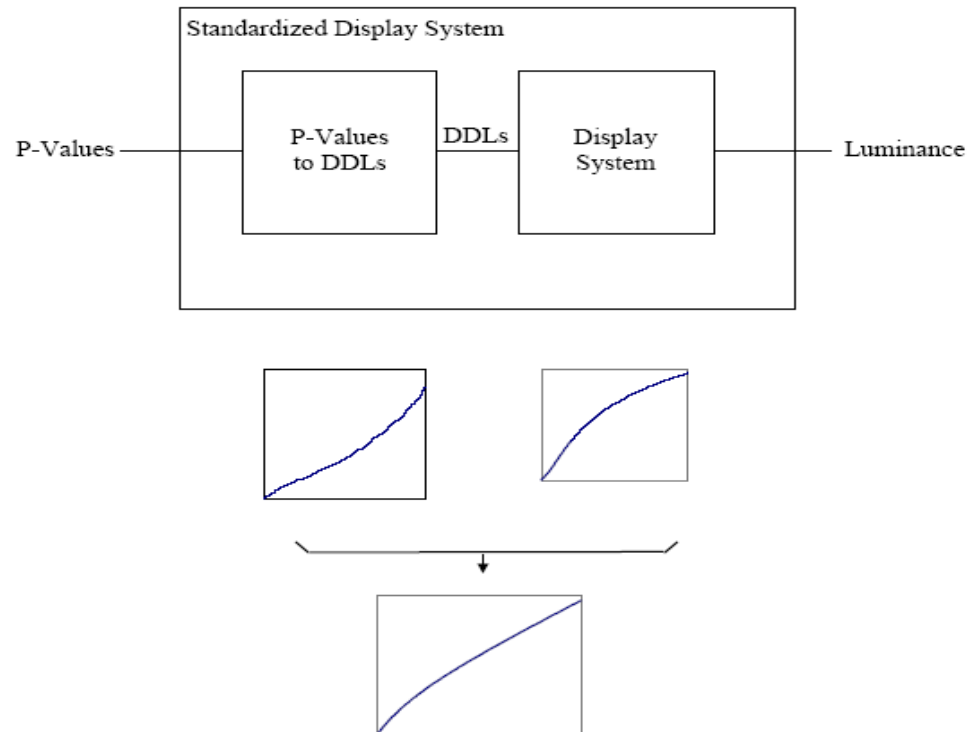
What is Grayscale Standard Display Function?



Note: The Presentation LUT may be an identity function if, for example, the Polarity is unchanged and the Values of Interest transformation outputs P-Values.

When exporting with GSDF; The image is exported with the promise that it will be displayed on a **Standard Display**

The GSDF Standard Display



The final image processing steps take place in the **Standard Display**

What if there is no **Standard Display Available?**

GSDF- Some Assembly required



Would you use your new table without unpacking it?
It would work?

Display Systems can be categorized into Standard Displays (GSDF-Calibrated) and General Displays (Non-GSDF-Calibrated)

It is very rare that the display systems are Standard Displays. Especially in the value segment market, most of the review station monitors are General Displays.

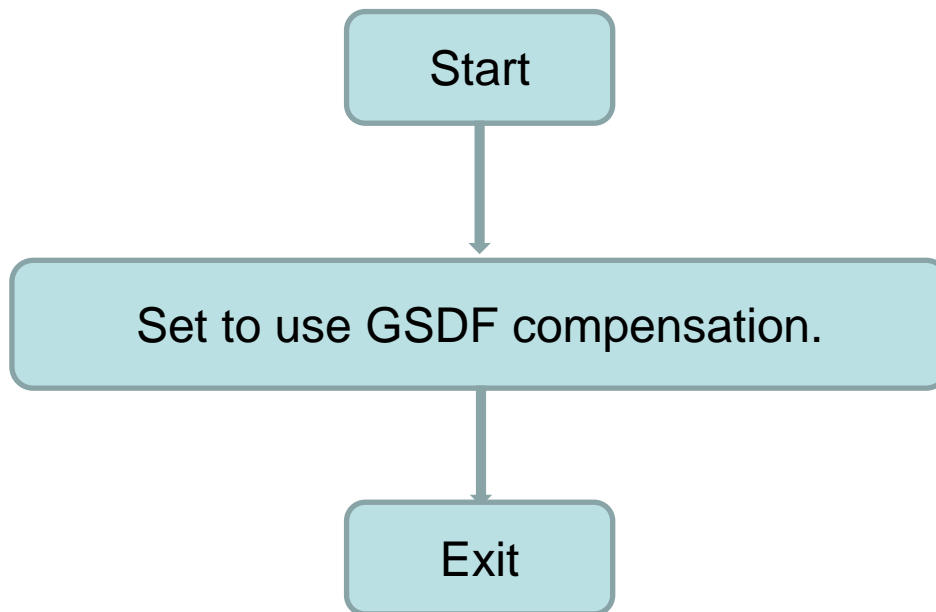
Customers demand for an alternative solution from vendors.

“Export Image Quality Optimization” provides :-

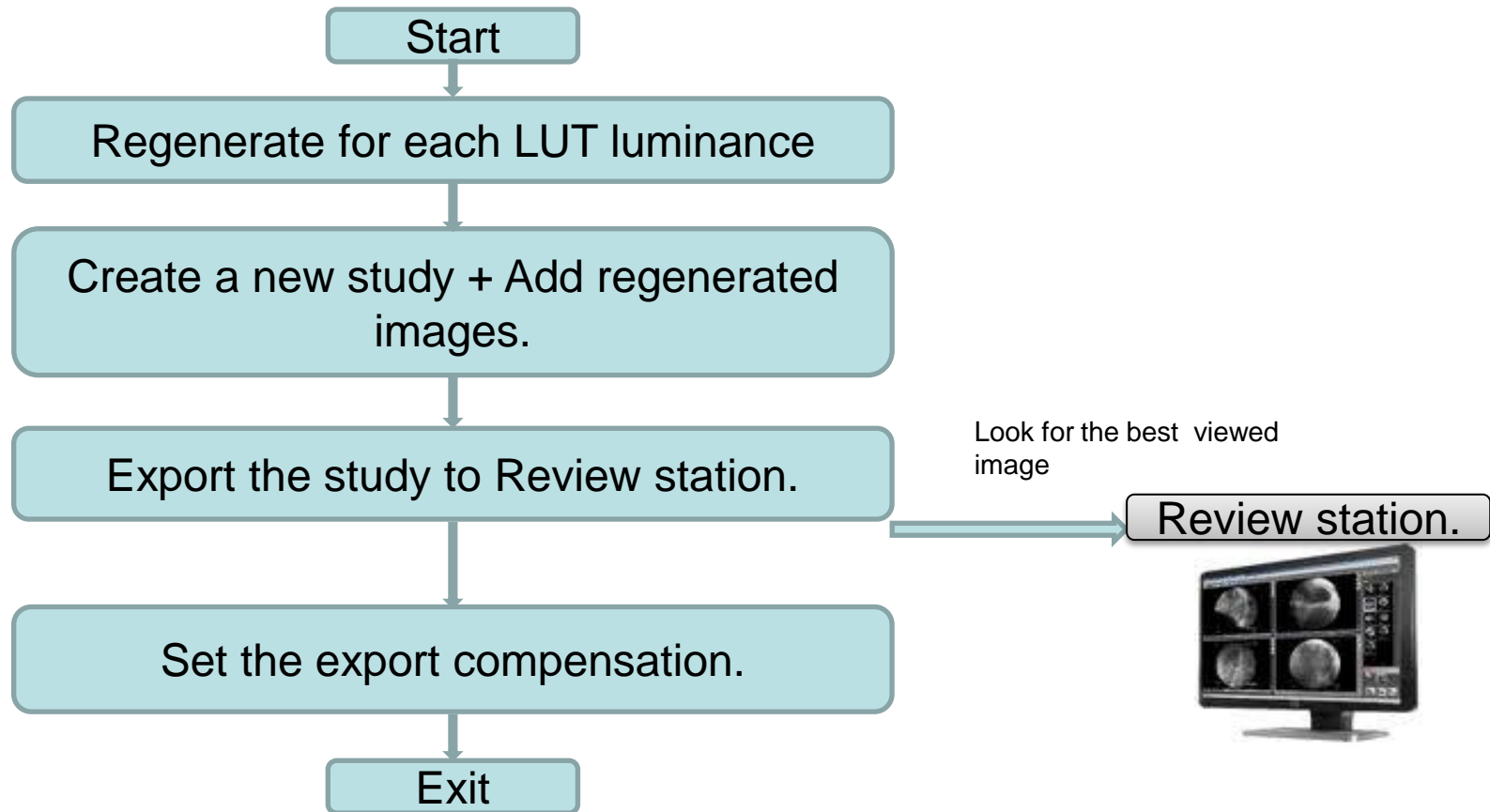
- ✓ **Customized LUT for a wide range of brightness luminance to support the Generic Displays.**
- ✓ **A wizard to guide the selection of appropriate LUT for the destination.**

Proposal - Workflow Enhancement

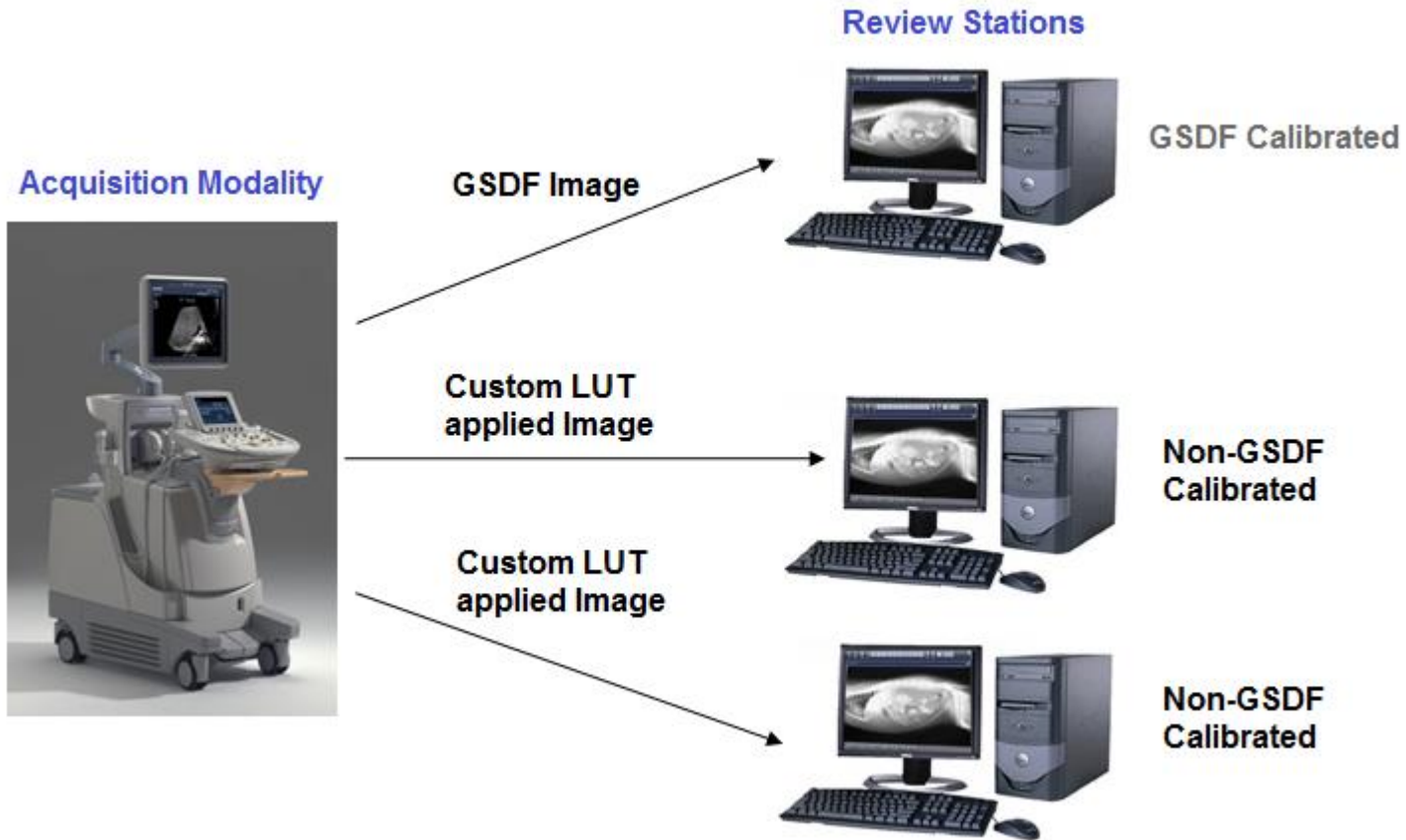
- **GSDF Calibrated review station.**



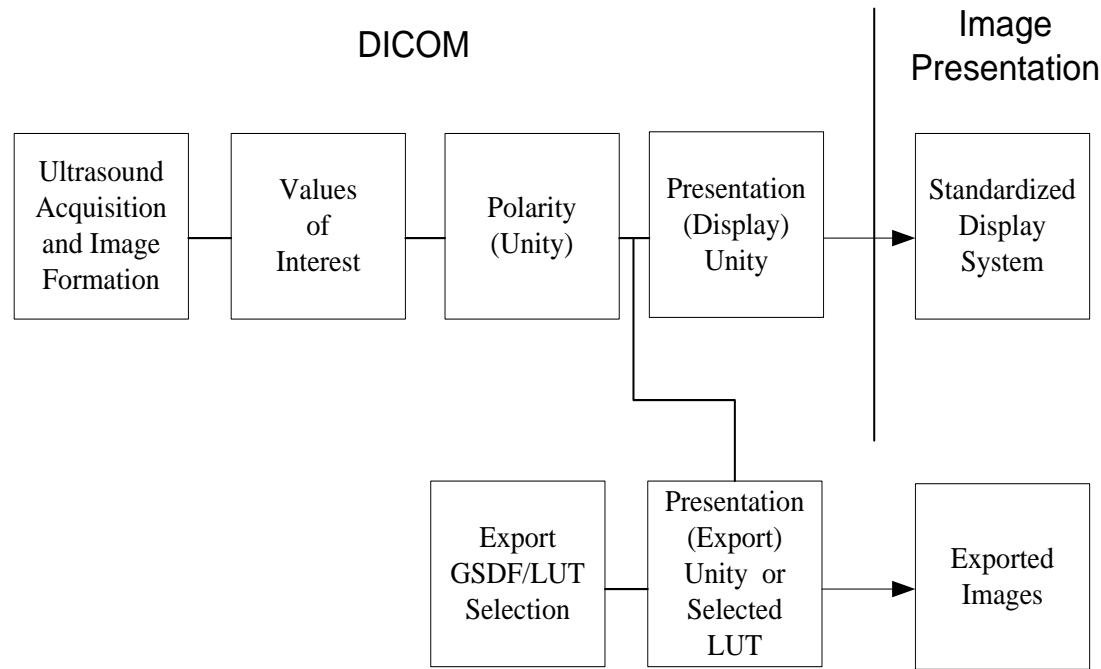
Non GSDF Calibrated review station



Pictorial Representation



How Export fits into the architecture:



- When exporting with GSDF (The Default); The image is exported “raw” without the final processing step.
- **GSDF = Some assembly required!!!**

An Analogy



Viewing a Raw GSDF image is like a car with just the primer coat



Same car viewed with a “Standard Display” or an appropriate export LUT is like applying the final coat of paint

Example Images



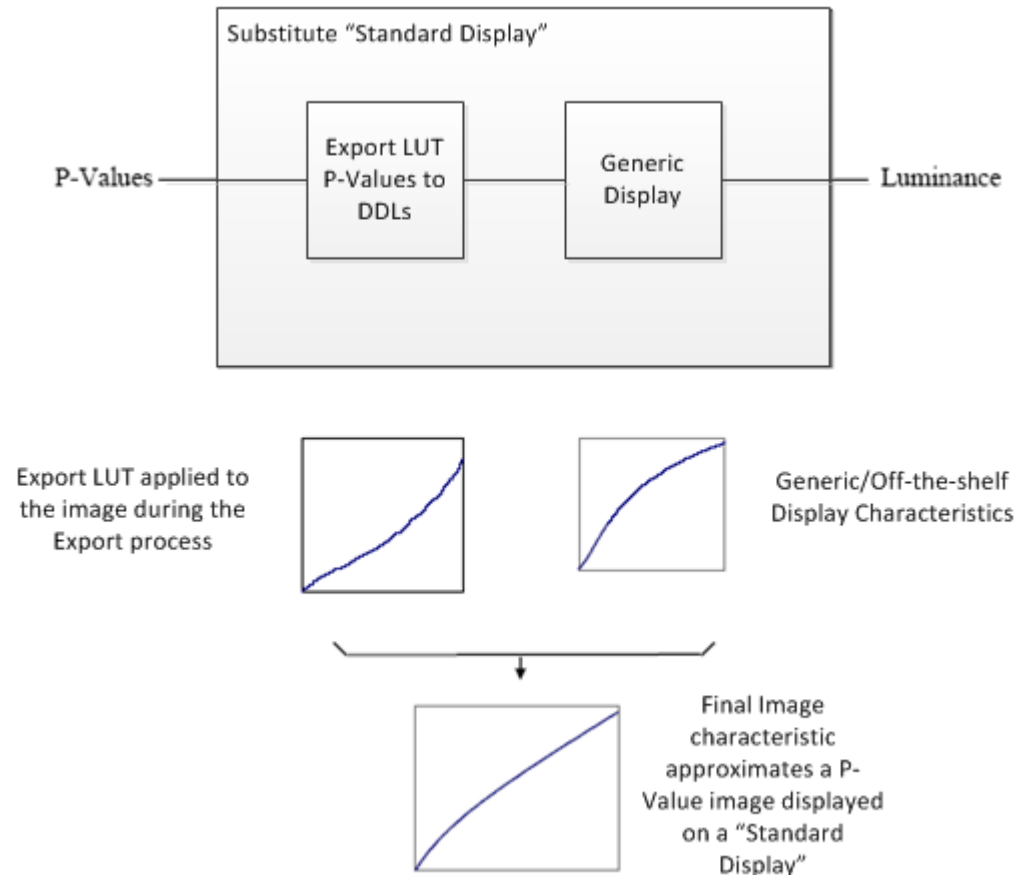
Raw GSDF images are too contrasty, over gained, and appear grainy



With the appropriate LUT the image is smoother and appears like it did on the system

A substitute “Standard Display”

Provided by a User selected Export LUT + Generic Display



Export LUT + a Generic Display approximates a “Standard Display”

- Export LUT + a Generic Display approximates a “Standard Display”**

- Supports GSDF for a Standard Display.**

- It is a one time task usually done by a doctor with the help of a Field Service Engineer (FSE). Future exports will use the selected settings.**

- There need to be an alternative setting available to facilitate this LUT selection at any point of time.**

- Even though the DICOM GSDF continues to address the issues related to differences in display characteristics, there are situations where a different solution may be needed.**
- The proposed solution enhances the DICOM GSDF by addition of a wide range of LUTs.**
- This helps in optimizing the exported image quality and hence provides the potential for better patient care.**

References



<http://dicom.nema.org/>

Shreelaxmi Bhat

- Shreelaxmi.Bhat@philips.com
- Philips Innovation Campus
Manyata Tech Park,
Nagavara,
Bangalore - 560045
India

Easwara Moorthy

- Easwara.Moorthy@philips.com
- Philips Innovation Campus
Manyata Tech Park,
Nagavara,
Bangalore - 560045
India

Thank you for your attention !