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Effective Strategy for verifying DICOM Conformance

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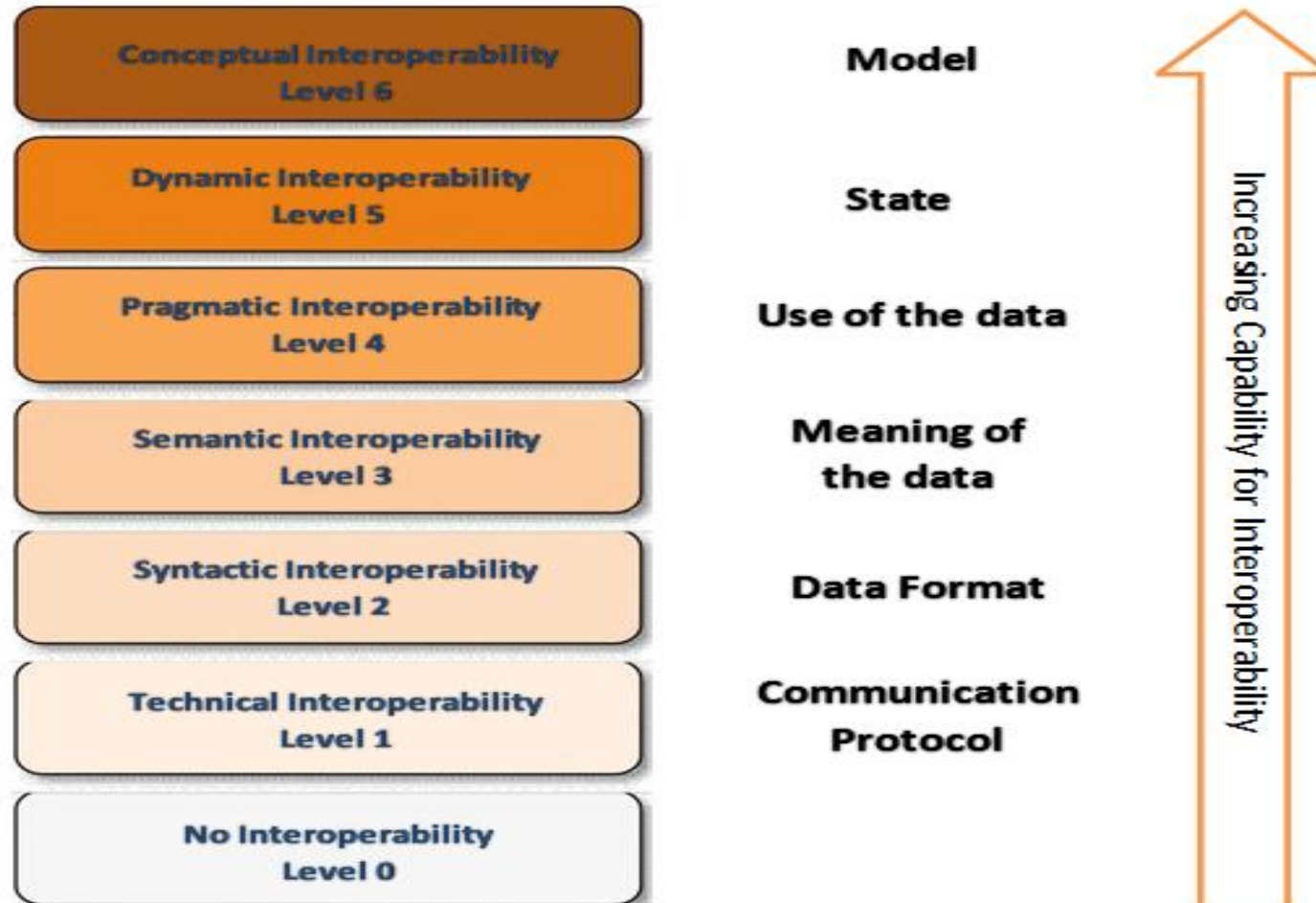
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PHILIPS

- **Introduction**
- **Challenges**
- **Verification Strategy**
- **Summary**
- **Conclusion**

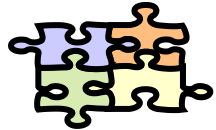


Interoperability Levels





Verification Strategy in Nutshell



DICOM Services



Transfer Syntax & Data Conversion



Data Variance



Harmonization & DICOM Data Model



Hazard Scenarios



Media Interoperability



Performance & Stress



VERIFICATION

STORE

STORAGE
COMMITMENT

QUERY/RETRIEVE

MODALITY
WORKLIST

PRINT

Approach:

- ❖ Multi Modality & Multivendor Data
- ❖ Data Variance - VM and VR
- ❖ Image Consistency
(Patient ID, Patient Name, Series, Images)
- ❖ Q/R : Mandatory & Optional Keys
- ❖ Query Levels : Study & Series

Benefits:

- ❖ DICOM Connectivity Stack Quality
- ❖ Compliance to DICOM Services

Transfer Syntax & Data Conversion Verification

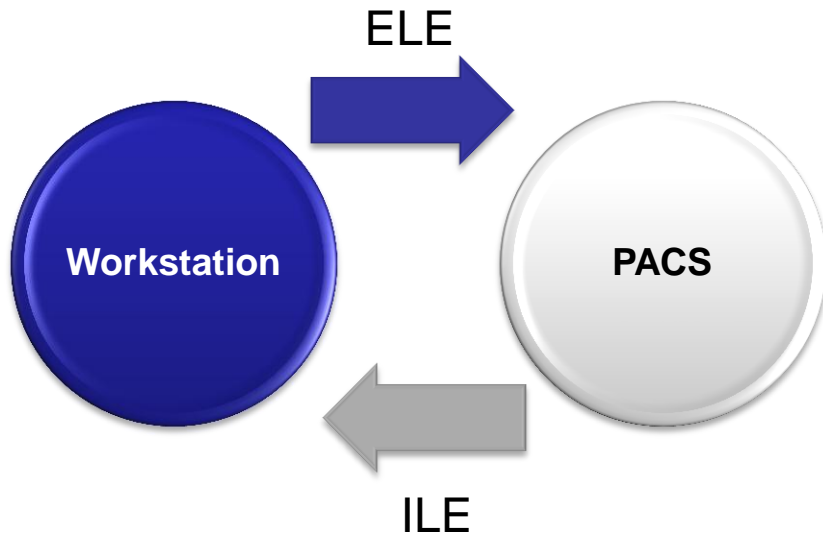
Approach:

- ❖ Multi Modality & Multi Vendor
- ❖ Transfer Syntaxes Variants Workflow

Scanner →ELE→WS→ILE →PACS →ELE→WS

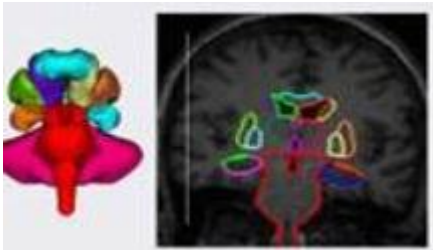
Benefits:

- ❖ Attribute Consistency – DICOM
- ❖ Attribute Consistency – Private
- ❖ Pixel Data consistency
- ❖ Compressed & Uncompressed data movement
- ❖ Signed / Unsigned Data



DICOM Data Model & Harmonization

Application generated data is compliant to DICOM Standards



Attribute Name	Tag	Type	VR	Value
Study Date	(0008,0020)			
Study Time	(0008,0030)			
Content Date	(0008,0023)			
Content Time	(0008,0033)			

Approach:

- ❖ Check values against DICOM & DCS
- ❖ Check VR, VM values against guidelines

Benefits:

- ❖ Compliant to DICOM Data Dictionary
- ❖ Adhering to DCS guidelines
- ❖ Consistent values/ Harmonized view across applications

- ❖ Patient safety aspects
- ❖ Patient mix-up
- ❖ Image Generation mechanism



Approach

- ❖ Data (Pixel) consistency
- ❖ Signed / Unsigned Data
- ❖ Image Geometry Checks

Benefits:

- ❖ Pixel data consistency
- ❖ Improves the Patient Safety

Media (CDs/DVDs) Creation/Reading- Standard **Approach:**



CD/DVD

- Different Media Type & Formats
- IHE PDI profile tests
- Reading of different vendor CDs/DVDs

Benefits:

- Media creation/reading - DICOM & IHE compliant

- ❖ Performance - Images Per Second (IPS)
- ❖ Stress - Size, # Studies, Associations
- ❖ Resource utilization (Memory & Processor)



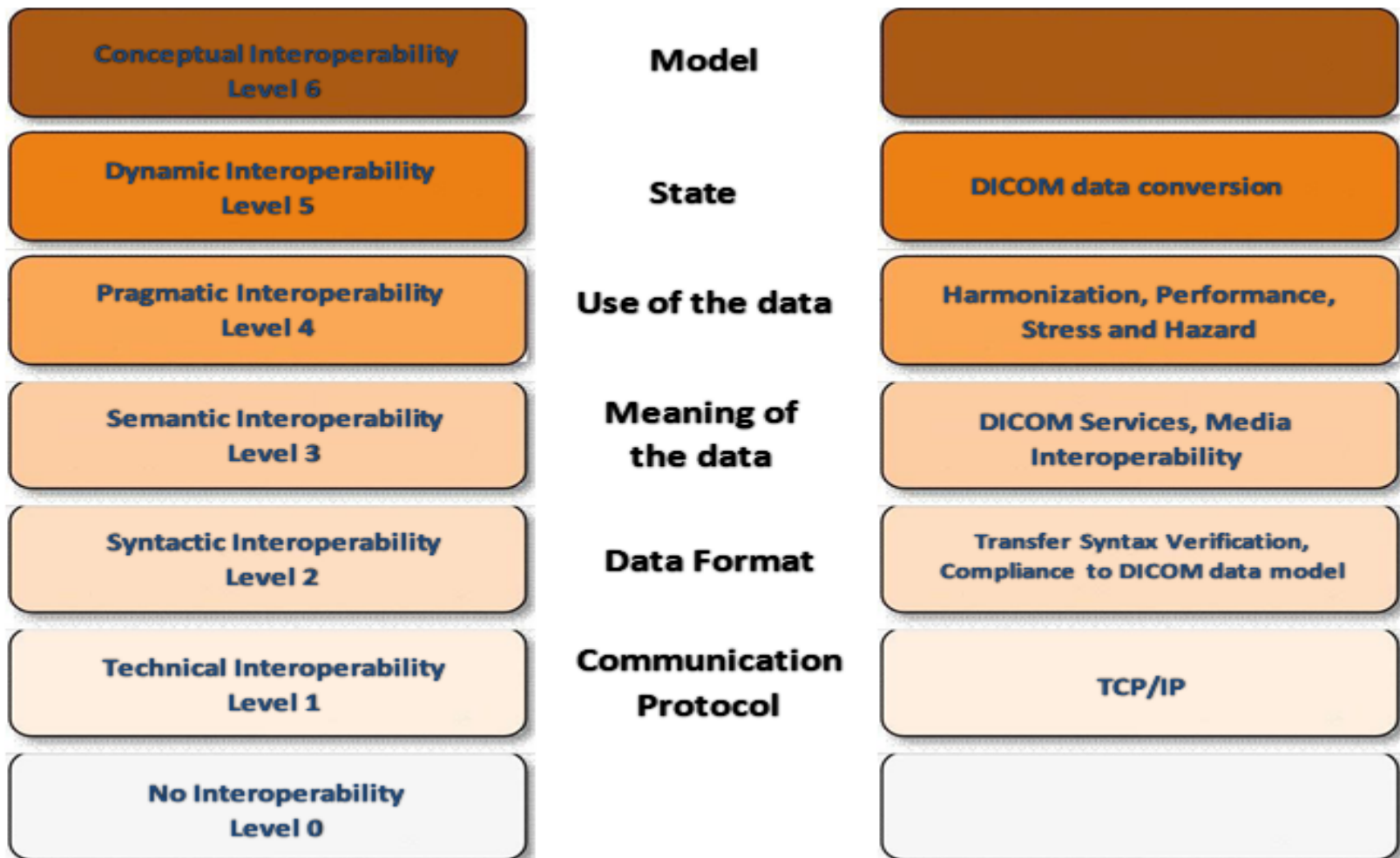
Approach:

- ❖ Images Per Second (IPS)
- ❖ Memory & Processor Utilization
- ❖ Patient Size
- ❖ # Association

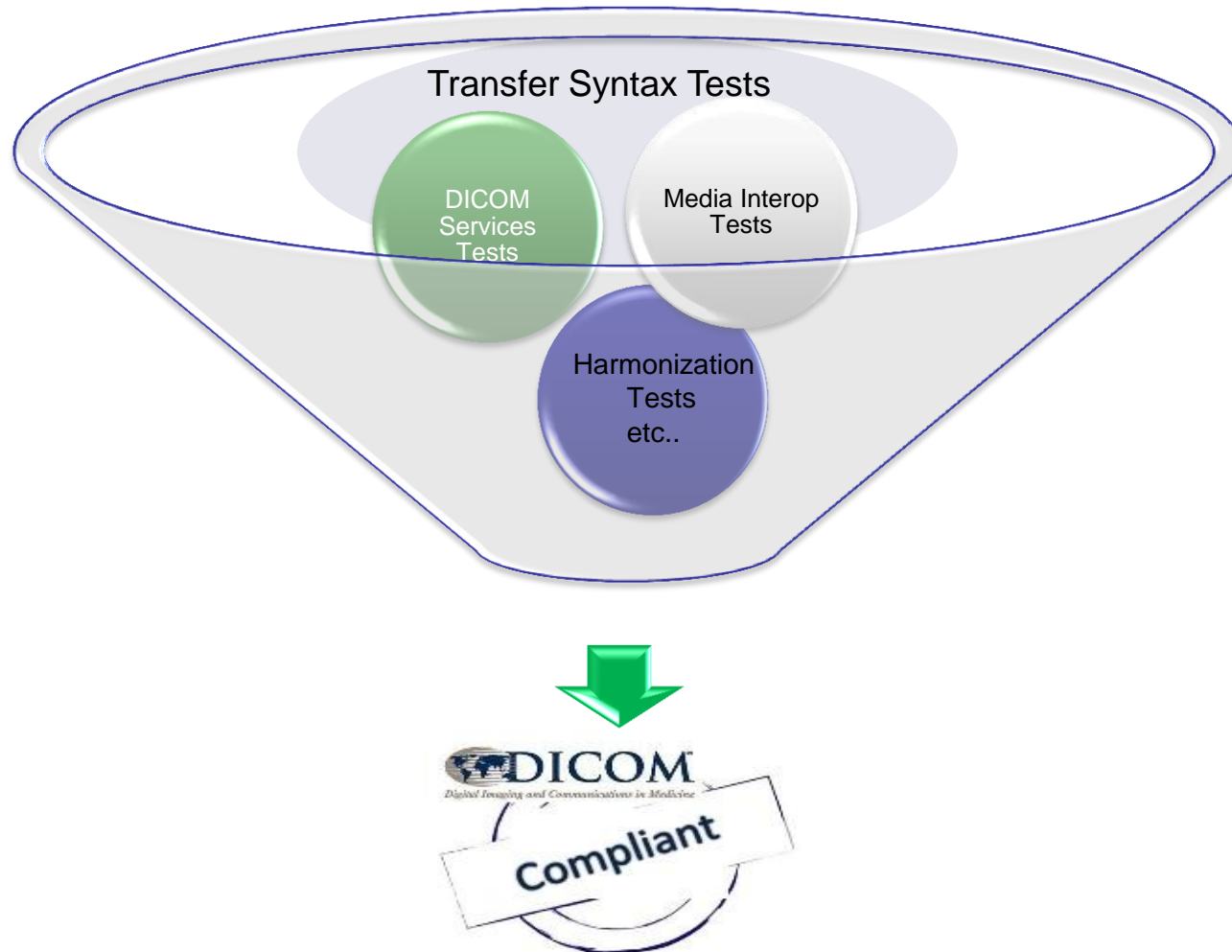
Benefits:

- ❖ Compare Current Vs Released
- ❖ Benchmarking
- ❖ Stability & Reliability

Summary



Conclusion



References



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



<http://www.IHE.net/>

http://en.wikipedia.org/wiki/Conceptual_interoperability

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Thank you for your attention !