You Deserve Better: Considerations for Successful Interoperability

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Connecting the Dots...Healthcare Technology & Interoperability
March 24th, 2017
Scottsdale, AZ

Agenda

- What is Interoperability
- Why Interoperability Matters
  - EHRs and Acceptance Levels
  - Governmental Mandates, Current State of Interoperability
    - ONC Initiatives and Major Policy Positions
    - MU Stage 3
    - Value-Based Reimbursement and Interoperability
- Where are we Today?
  - XDS has come of age
  - Major IHE Exchange Functions
  - IHE Document Exchange
  - Emerging Standard: Smart on FHIR
  - Imaging Exchanges
- Takeaways

Federal Goals of Health Information Technology

Goal #1

Provide better Health Information Tools, such as Electronic Health Records for use by clinicians in providing care.

Goal #2

Connecting Health Information so that it follows patients throughout care and can be aggregated to advance care delivery.

Goal #3

Supporting consumers with information to help them in managing their care.

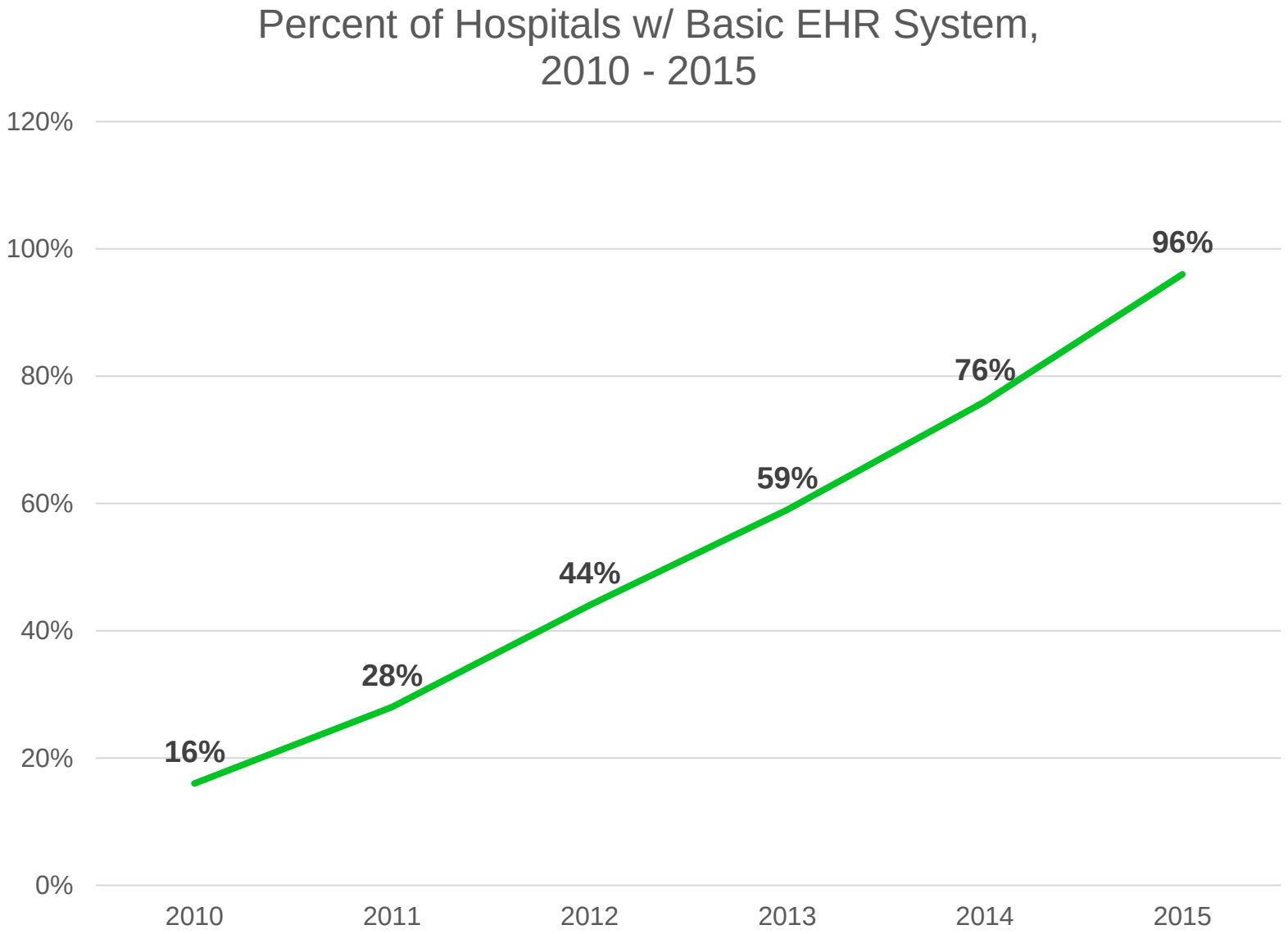
Goal #4

Advancing public health, clinical trials, and other data-intensive activities.

Source: *IT Interoperability and Use for Better Care and Evidence*, National Academy of Science, Sept 2016

Why Interoperability Matters

The Good News: Hospitals and Health Systems are beginning to share some data electronically and there had been strong penetration of the deployment of EHR's.



Sources:
AHA Annual Survey, HIT, FY 2010-2014
ONC, for 2015

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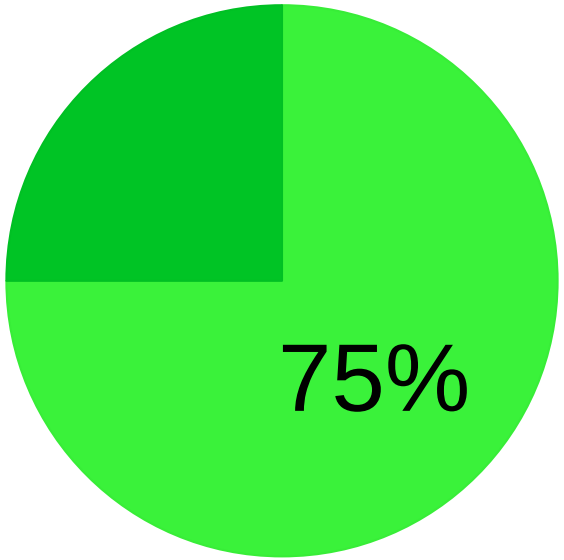
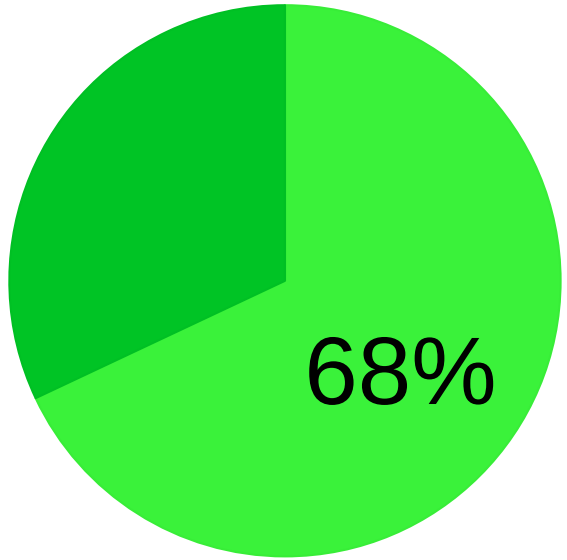
Technology has helped improve quality and promote better care.



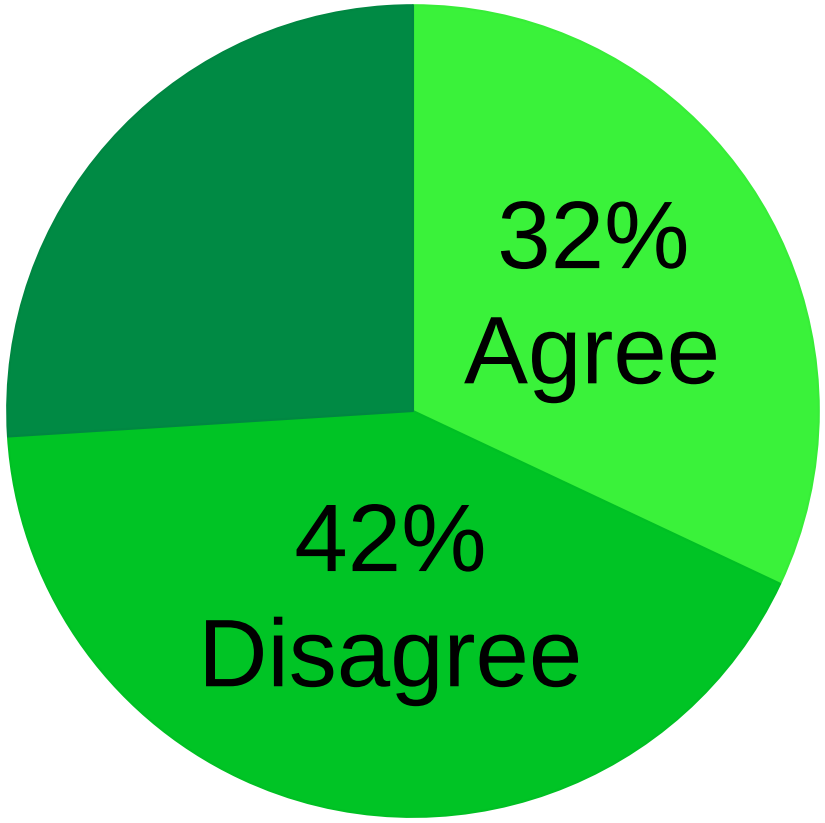
Since 2008, technology has helped increased healthcare quality!



Since 2008, technology has helped promote team-based care concepts!

Source: Current State of Progress Towards True Interoperability, eHealth Initiative Survey, 2016

Has Technology Impacted Cost.



Disagreement as to whether technology has helped to reduce healthcare costs.

Are we really bending the cost curve?

Source: Current State of Progress Towards True Interoperability, eHealth Initiative Survey, 2016

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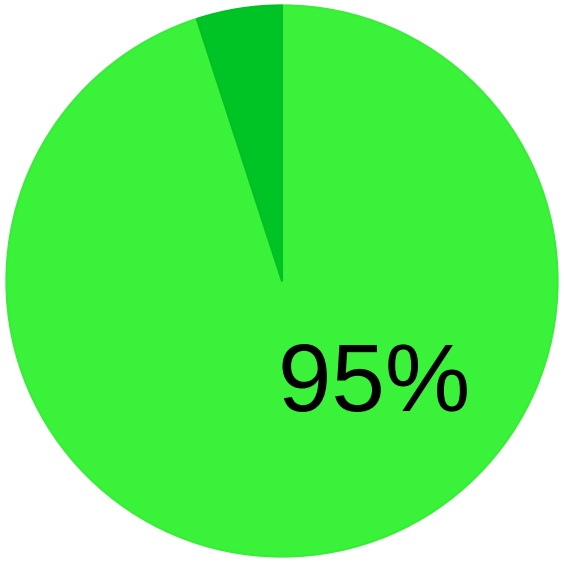
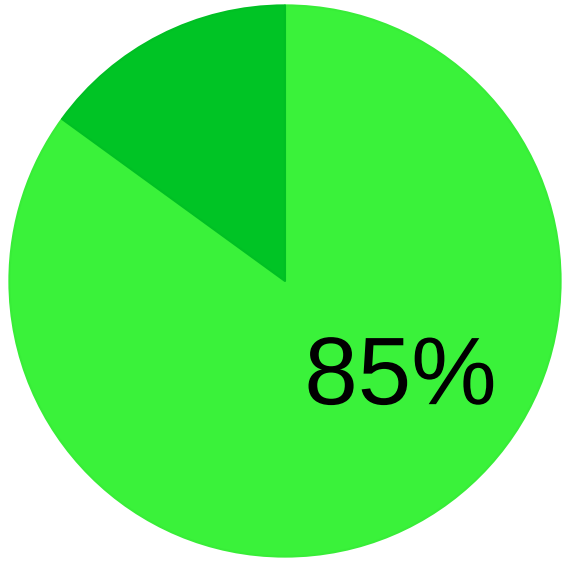
Interoperability is needed to improve quality and promote better care.



Strong interoperability capabilities are a key IT requirement to transition to **Value-Based Care**!



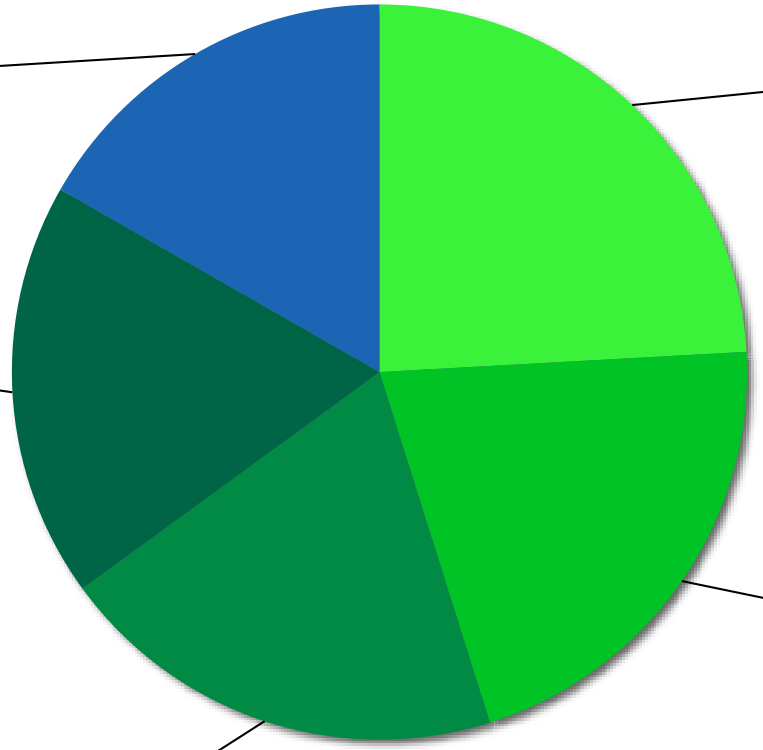
Current interoperability capacities are not meeting needs to transition to **Value-Based Care**!

Source: Current State of Progress Towards True Interoperability, eHealth Initiative Survey, 2016

Major Challenges to Interoperability

Consensus-based standards for data, vocabulary, and transport
17%
(Canonical Data Model)

Standardized pricing and integration solutions from vendors
24%
(Dept vs. Enterprise)



Cultural changes resulting in the desire or need to share eHealth data
18%
(Clinical vs. IT)

Technology platforms that are "plug and play"
21%
(Platform vs. App)

Federally mandated standards
20%
(Interoperability Road Map)

2016 eHealth Initiative Poll
N=135

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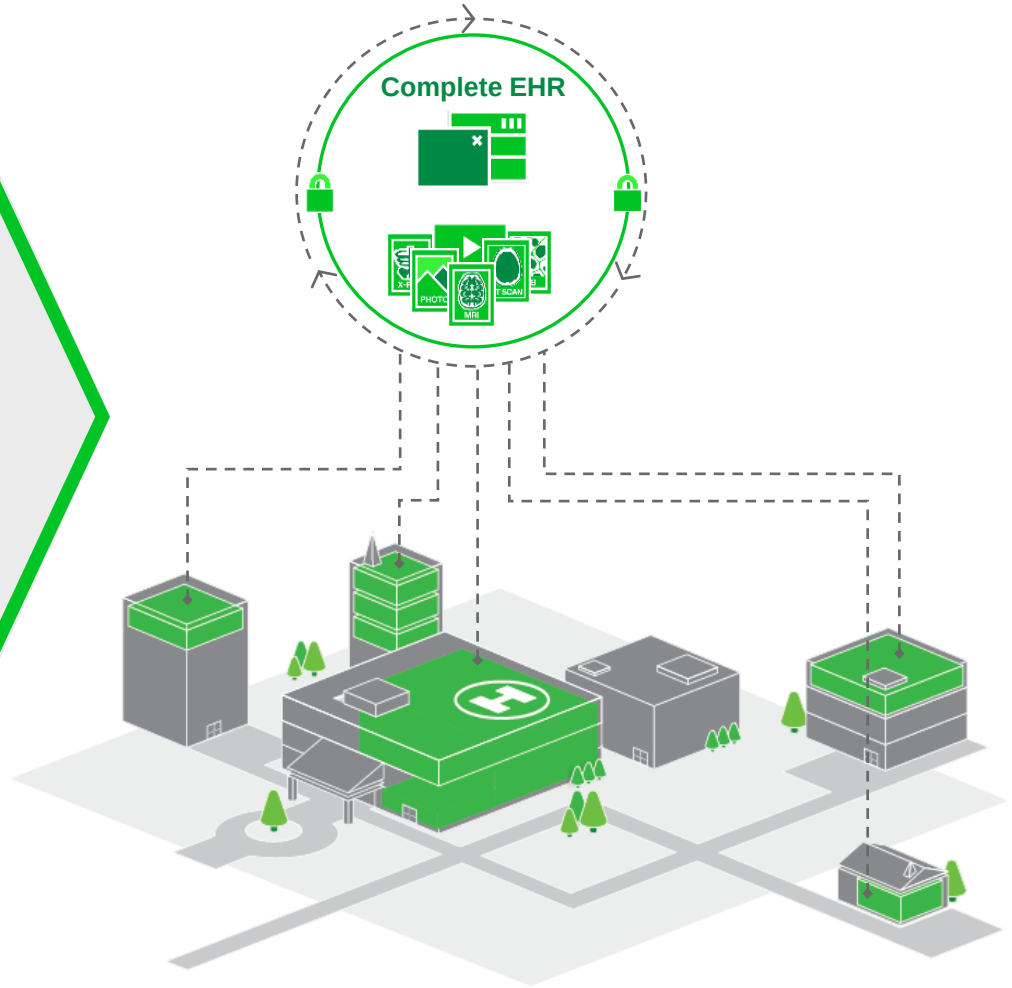
Current impact with healthcare interoperability

Most Impacted

Least Impacted

- Expedited access to externally sourced patient data
- Identify gaps and improve quality by closing care gaps during care encounters
- Closing Referral Loops
- Enable enhanced patient access to data to their medical records
- Enable patients to provide remote data

Collaborative Care Enterprise



Source: ehealth Initiative Survey, Dec., 2016

Why Interoperability Matters – Key Use Cases Today

- Children's Hospital, Boston, 85 patients transferred from one hospital to another found duplicate testing on 32% of the patients.

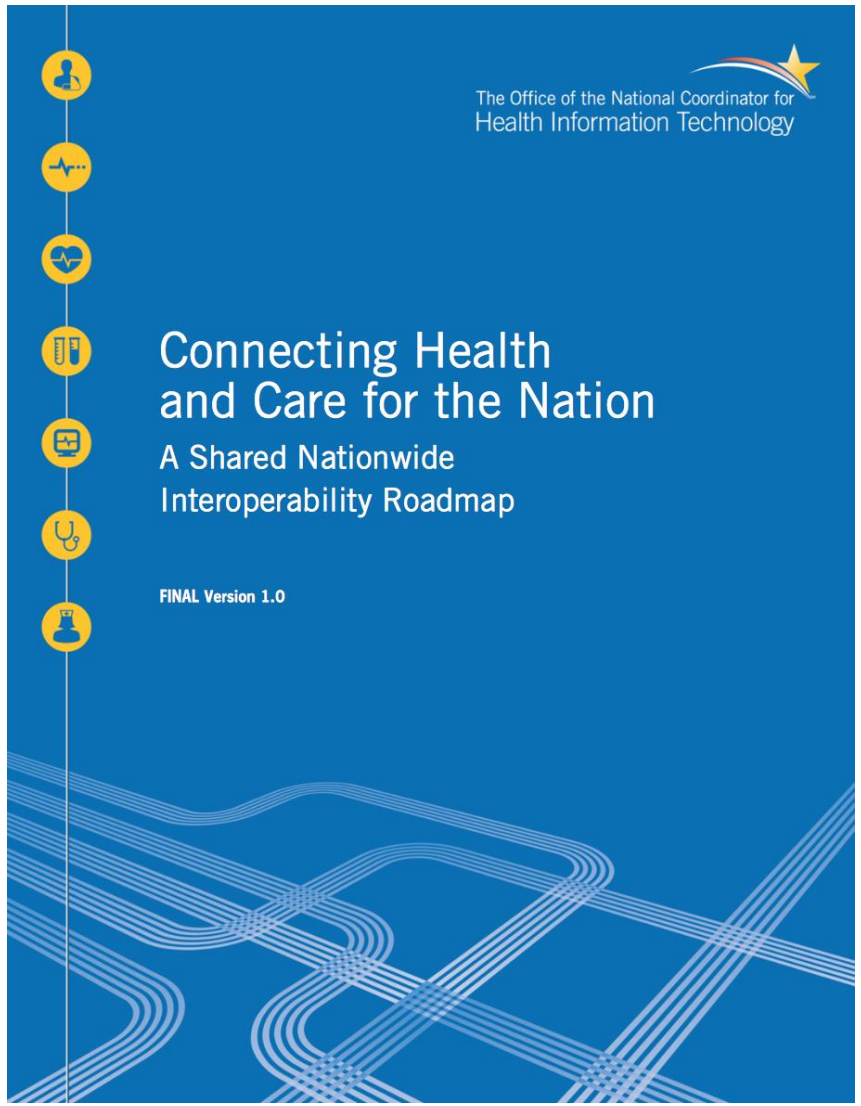
- Another study estimated that the use of EHRs can result in a net benefit of $86,400 per provider over five years through savings in drug expenditures, improved utilization of testing and improved billing practices.

- Annual nationwide estimates for cost savings through Interoperability approach $30 Billion annually.

* J Am Med Inform Assoc (2010) 17 (3): 341-344

- The lack of interoperability shows up many ways every day
  - Critical fields in a care summary are missing when a nurse at the receiving hospital opens and reviews it.
  - Values in a lab report incorrectly appear in the wrong section.
  - Inability to share details about care provided to a patient in a hospital with subsequent providers, such as SNFs, IRFs, or HHAs.
  - A specialist's report to a hospital somehow turns from English into gibberish.

ONC Interoperability Roadmap Goals



- **2015-2017:** Send, receive, find and use priority data domains to improve health care quality and outcomes.
- **2018-2020**: Expand data sources and users in the interoperable health IT ecosystem to improve health and lower costs.
- **2021-2024:** Achieve nationwide interoperability to enable a learning health system, with the person at the center of a system that can continuously improve care, public health, and science through real-time data access.

21st Century Healthcare Cures Act

- **Discovery** ensures that the NIH is provided with a total of $4.8 billion in new funding
- **Development** addresses modernizing clinical trials, utilization of biomarkers, and improving FDA flexibility
- **Delivery** supports improved interoperability of electronic health records to insure care coordination and improve delivery.

New Reimbursement Models – “The New Game”

Area	Examples
Payment Bundling	Medicaid demonstrations National pilot program development Now MACRA
Accountable care organizations (ACOs)	Medicare Shared Savings Program Pediatric ACO program
Pay-for-Performance	Reduced payments for health care-acquired conditions Hospital-based value purchasing Payment systems for physicians, home health care, and skilled nursing facilities
Care Coordination and Transition	State option for medical homes for Medicaid enrollees w/ chronic conditions Community-based care transition programs Independence at home demonstration projects

Meaningful Use Three Stages

January 2009 to July 2010

Stage 1

Improved Capture of Clinical Information

July 2009 to December 2011

Stage 2

Advancing Clinical Processes

Originally 2012 To 2013, Starts 2017

Stage 3

Advancing Clinical Outcomes

Stage 3 MU Stage Provider Final Rules

- PHI, Security Risk Assessment
- => 60% patient eRx queried to drug formulary and transmitted using CEHRT
- CDS provider measures (=> 5)
- CPOE => 60% transmitted to three clinical areas (Meds, Lab, Diagnostic Imaging Orders)
- Patient access measures (2 required)
- Coordination of care through active engagement of patients (3 measures)
- HIE to encourage interoperability
- Public health to clinical data registries (5 reporting registries required)

Updated: Nov 2016

Stage 3 MU Stage Hospital Final Rules

- Same as Provider
- => 25% discharged eRx queried to drug formulary and transmitted using CEHRT
- CDS hospital measures (=> 2)
- Same as Provider
- Same as Provider
- Same as Provider
- Same as Provider
- Same as Provider

Updated: Nov 2016

Regulatory Relief – Top Recommendations for HHS

Patient Identification:
Support private sector efforts!

MU:
Delay Stage 3

Interoperability:
Prioritize adoption of a single set of standards

MIPS:
Treat 2018 as a transition year removing MU3 measures

Quality:
90-day reporting requirement & postpone eCQM

Telemedicine:
Support payment & delivery reform efforts

Cyber Security:
Encourage investment through positive incentives for providers

CHiME

Public Policy Recommendations

March 16, 2017

Overall Trends in the Healthcare Industry towards interoperability

- Interoperability is important to support value-based care initiatives
- Interoperability can have an impact on healthcare organizations that can reduce costs
- Value of interoperability is dependent upon the type of information being exchanged
- Mixed reaction to federal intervention with interoperability, *should reimbursement drive incentives?*
- Little commentary is recognized from providers about the impact of “Provider Blocking”

“It is imperative for providers across the healthcare continuum to consistently send and receive accurate and meaningful patient data. Otherwise we will fail to realize the benefits of interoperability: improvements in clinical decision-making and patient safety, operational process improvement, and support for value-based care.”

Modern Healthcare, The Challenge of Interoperability, July 2016

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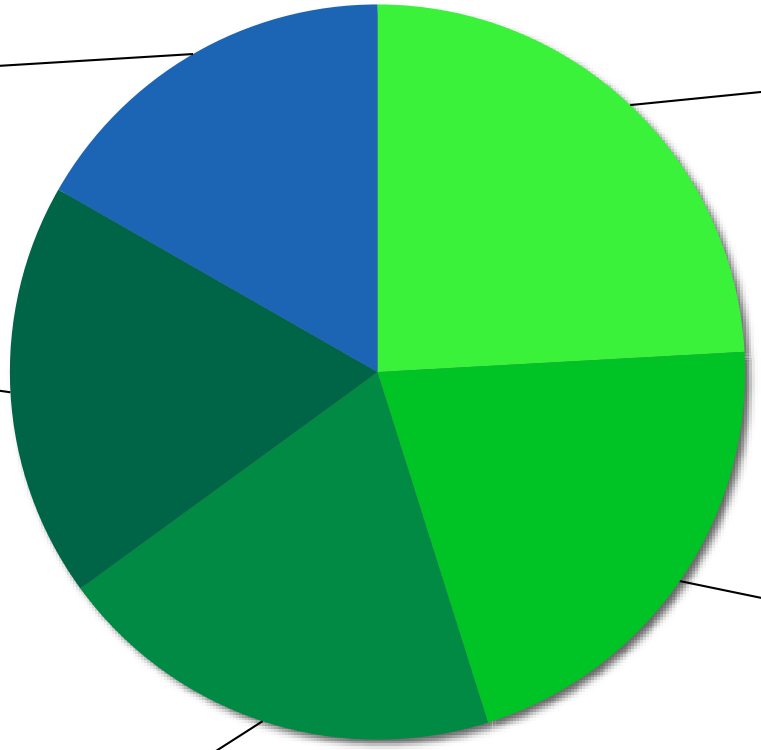

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What is Interoperability

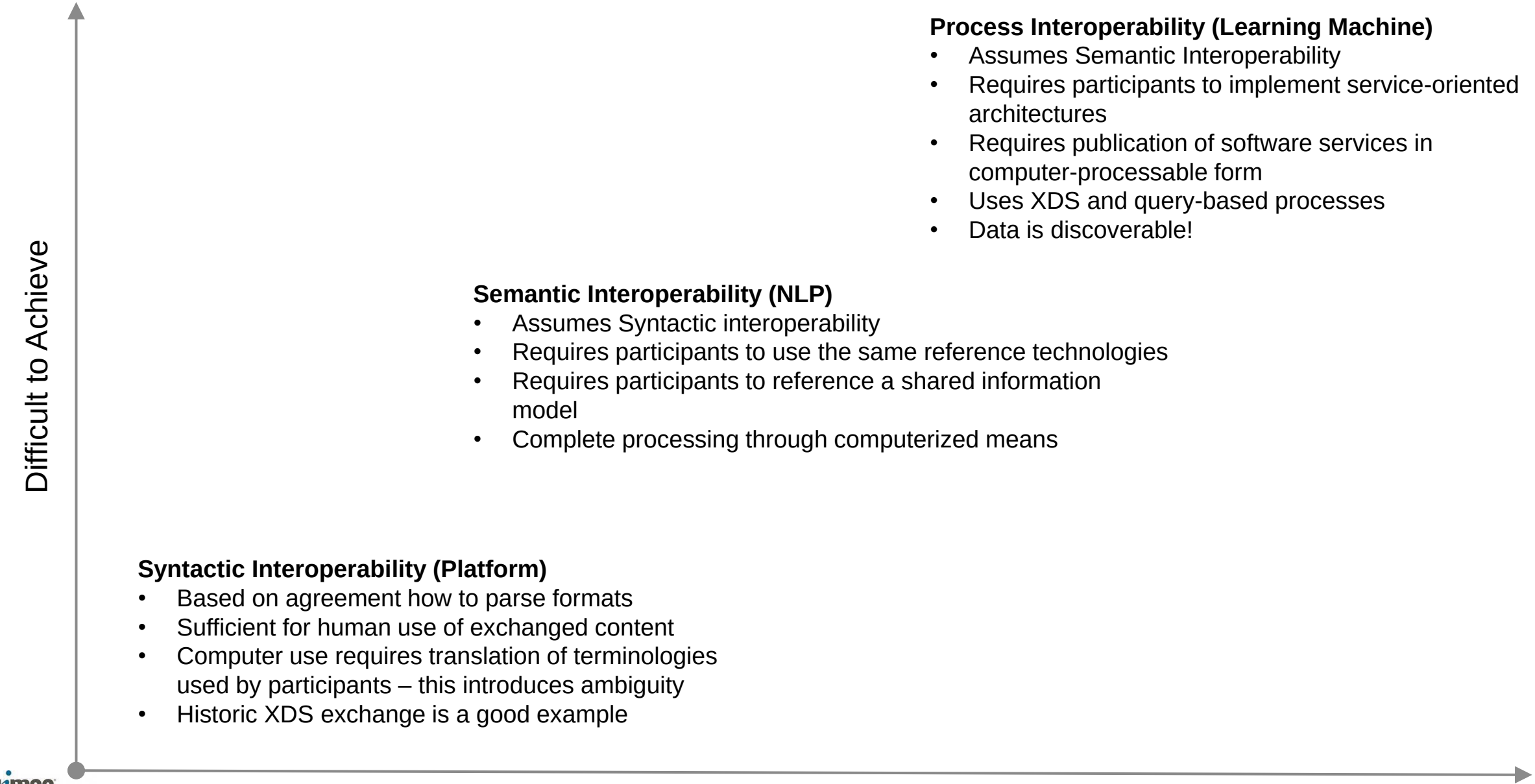
Classic Definition

...Interoperability is a health information systems ability, with minimum human intervention, to participate in externally defined, highly automated, clinical and business processes through the exchange of electronic data.

Four Aspects of Interoperability

Connectivity:	A shared communications medium supporting a wide variety of protocols.
Format:	Adopted standards which are agreed upon, example “HL7”, “IHE”, “FHIR”, etc.
Meaning:	Data meaning has to be understood, little ambiguity can be acceptable, example CCDs, SNOWMED, etc.
Process:	Interoperability is enhanced when services are provided in a standard, computer-processable way.

Three Levels of Interoperability



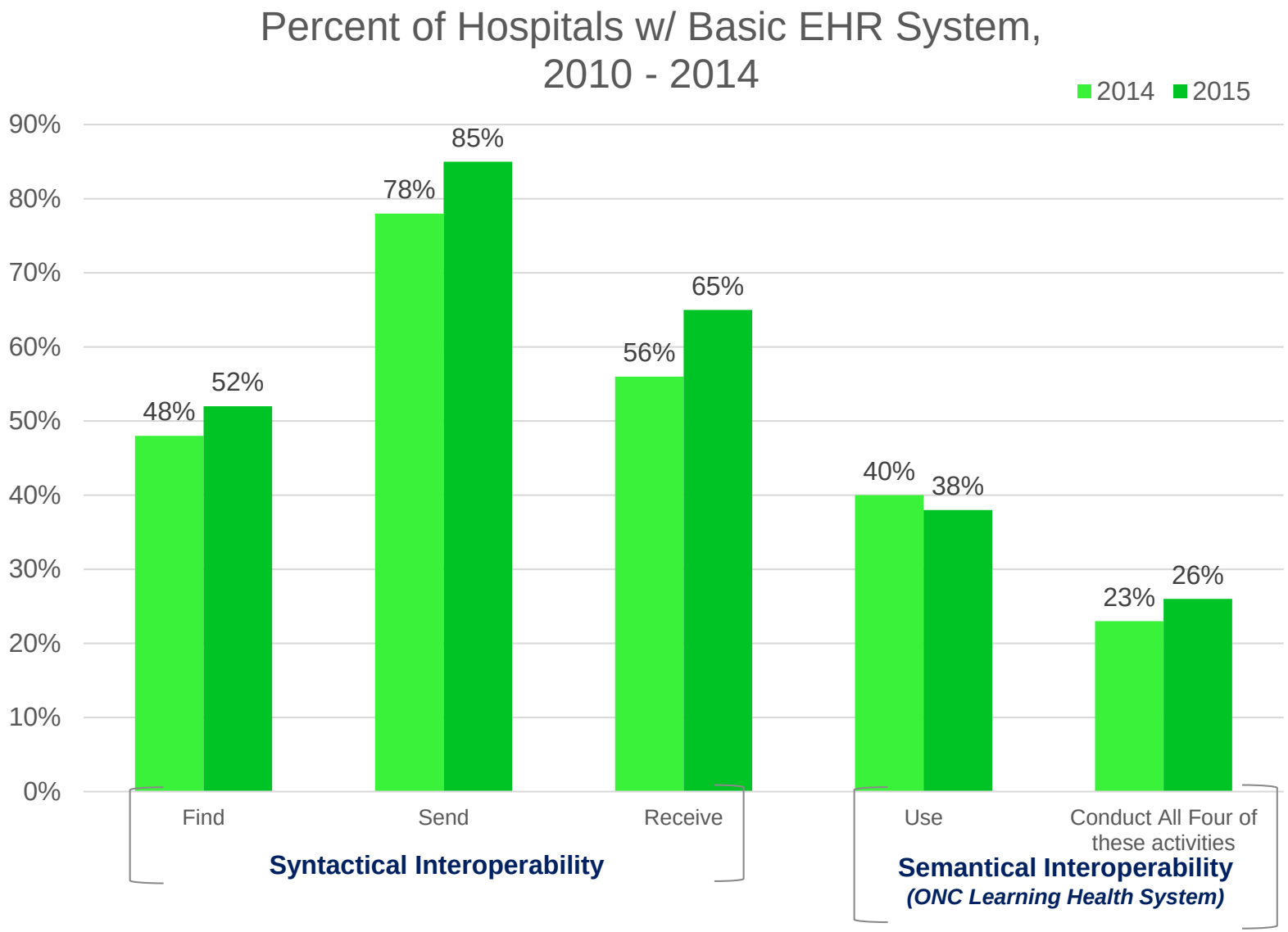
Process Interoperability (Learning Machine)
- Assumes Semantic Interoperability
- Requires participants to implement service-oriented architectures
- Requires publication of software services in computer-processable form
- Uses XDS and query-based processes
- Data is discoverable!

Semantic Interoperability (NLP)
- Assumes Syntactic interoperability
- Requires participants to use the same reference technologies
- Requires participants to reference a shared information model
- Complete processing through computerized means

Syntactic Interoperability (Platform)
- Based on agreement how to parse formats
- Sufficient for human use of exchanged content
- Computer use requires translation of terminologies used by participants – this introduces ambiguity
- Historic XDS exchange is a good example

Why Interoperability Matters

- Although ability to find, send and receive increased.
- Only 38% can use the information they receive.
- And only 26% can do all the exchange functions.
- Only Human Requests



Sources
AHA Annual Survey, HIT, FY 2010-2014
Healthcare Informatics for 2015

(Data Persistence + Data Perception) = Process Interoperability

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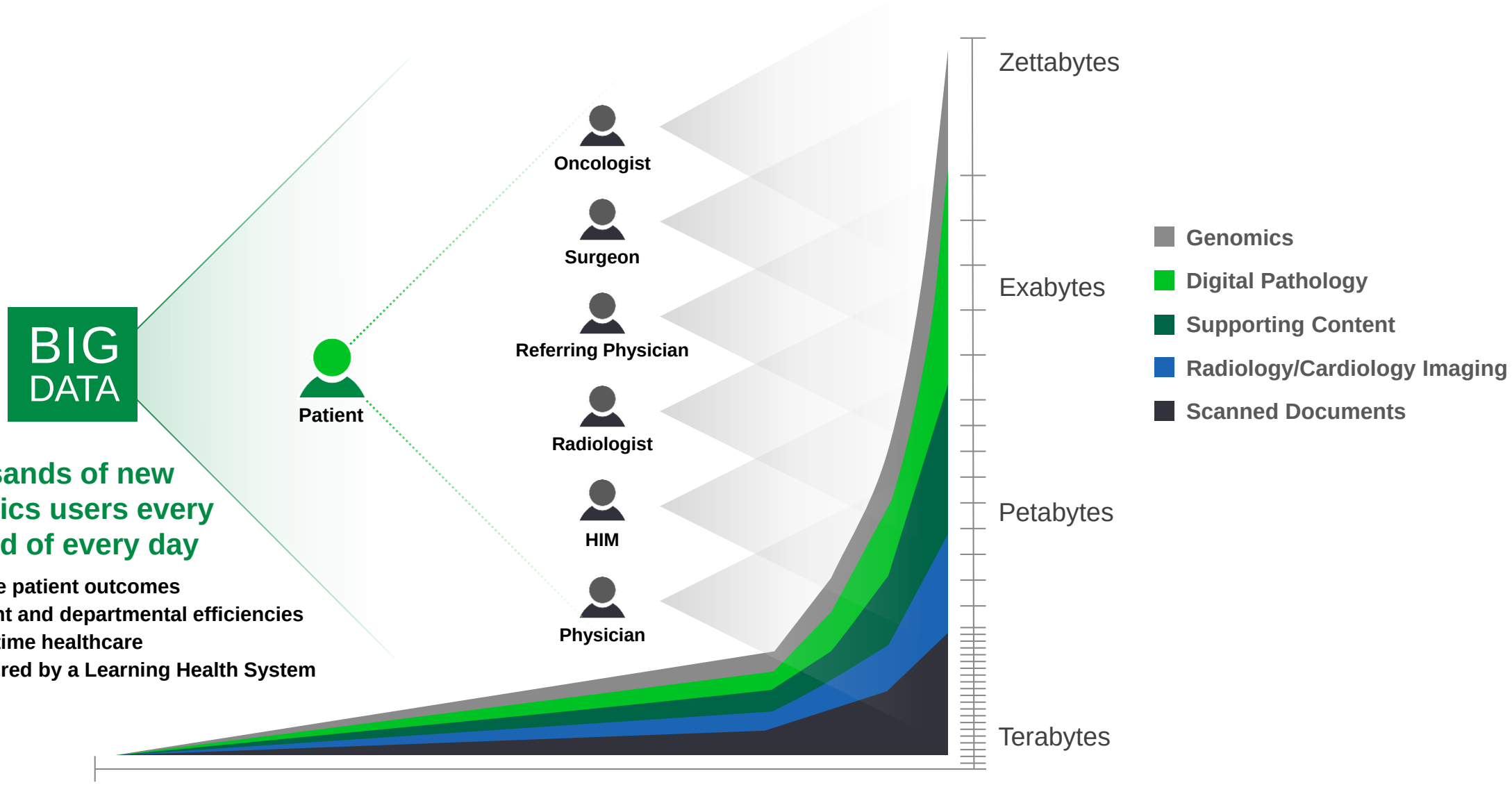
Unprecedented demand for information



Thousands of new analytics users every second of every day

- **Define patient outcomes**
- **Patient and departmental efficiencies**
- **Real-time healthcare**
- **Required by a Learning Health System**

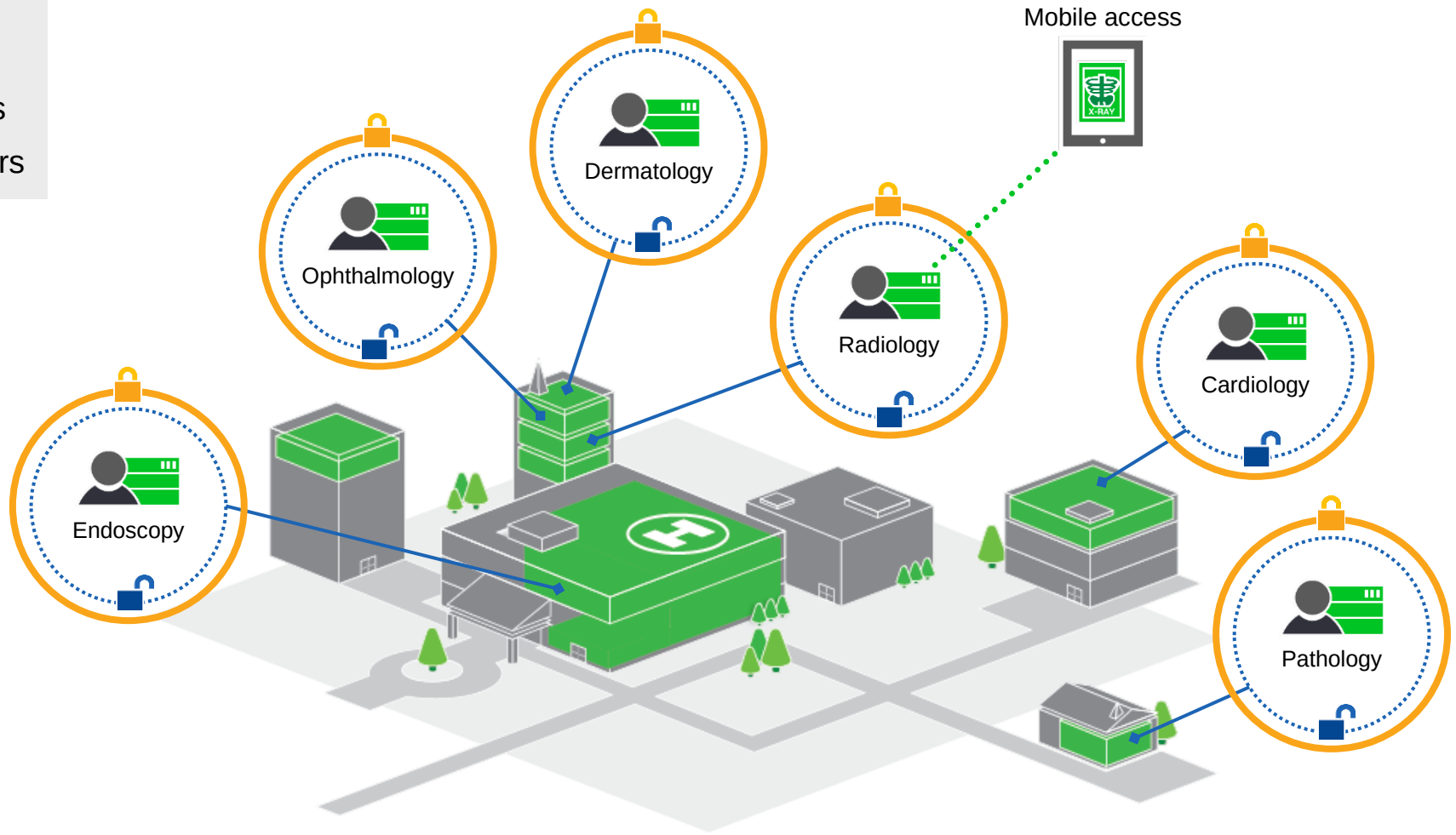
Silos of Information

Silos of vendor ***locked*** and ***blocked*** information with PHI exposure in every department

- Limited access for clinicians
- Departmental silos
- Access controlled by applications
- Migrations every 5, 8 and 15 years

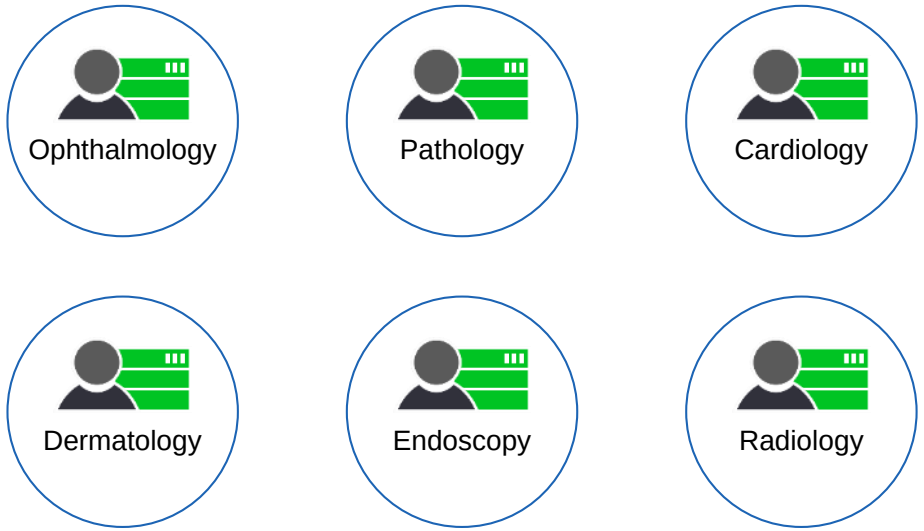
- Multiple DR plans
- PHI exposure

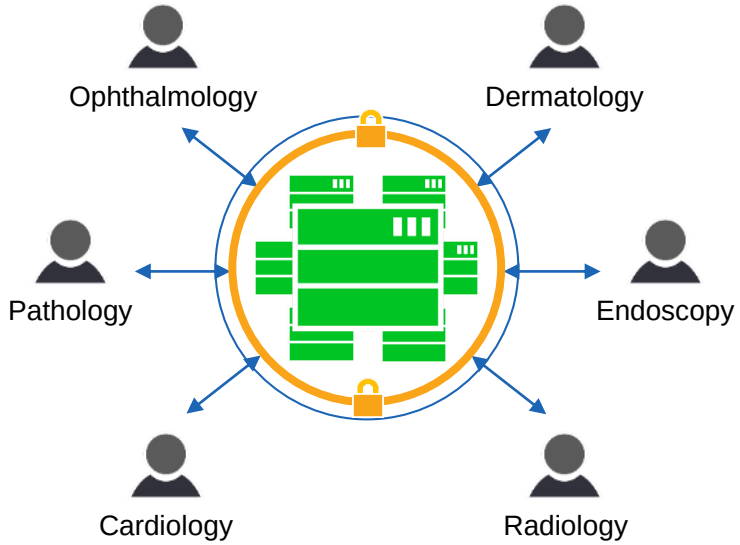
- Vendor Lock & Block
- Provider Locked



Collapse the silos of information logically then physically

True VNA solutions logically centralize patient, clinical and business content into one standards-based location and assure interoperability.





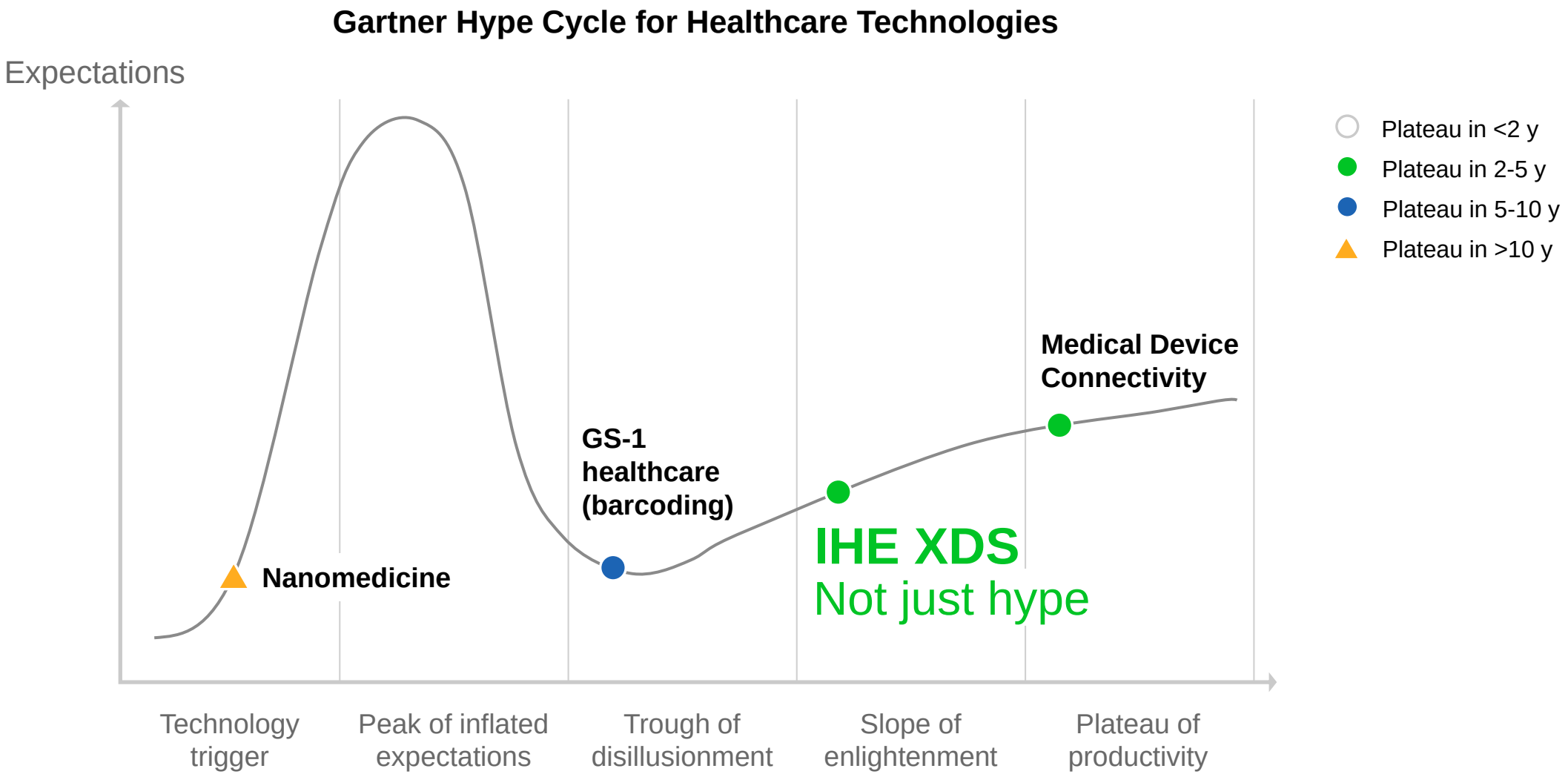
BEFORE

- Limited access for clinicians
- Departmental silos
- Access controlled by applications
- Vendor ***lock*** and ***block***
- Migrations every 5, 8, and 15 years

AFTER

- Single point of access for clinicians
- EMR integration for access control
- Consolidated storage focus
- Single DR plan, supporting a BC plan for multiple applications
- Simplified migrations with cost removal
  - Disk to disk
  - App to app
  - Data refresh
- Added security limits PHI exposure

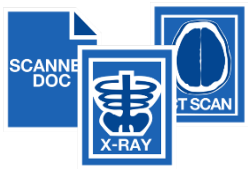
XDS is coming of age



What can be shared?

An XDS ‘document’ is **any** type of clinical information stored **in native format**

As long as **format complies** to a published standard



Pictures

JPEG, DICOM image, TIFF

Documents

Adobe PDF, Microsoft Office OpenXML

XML

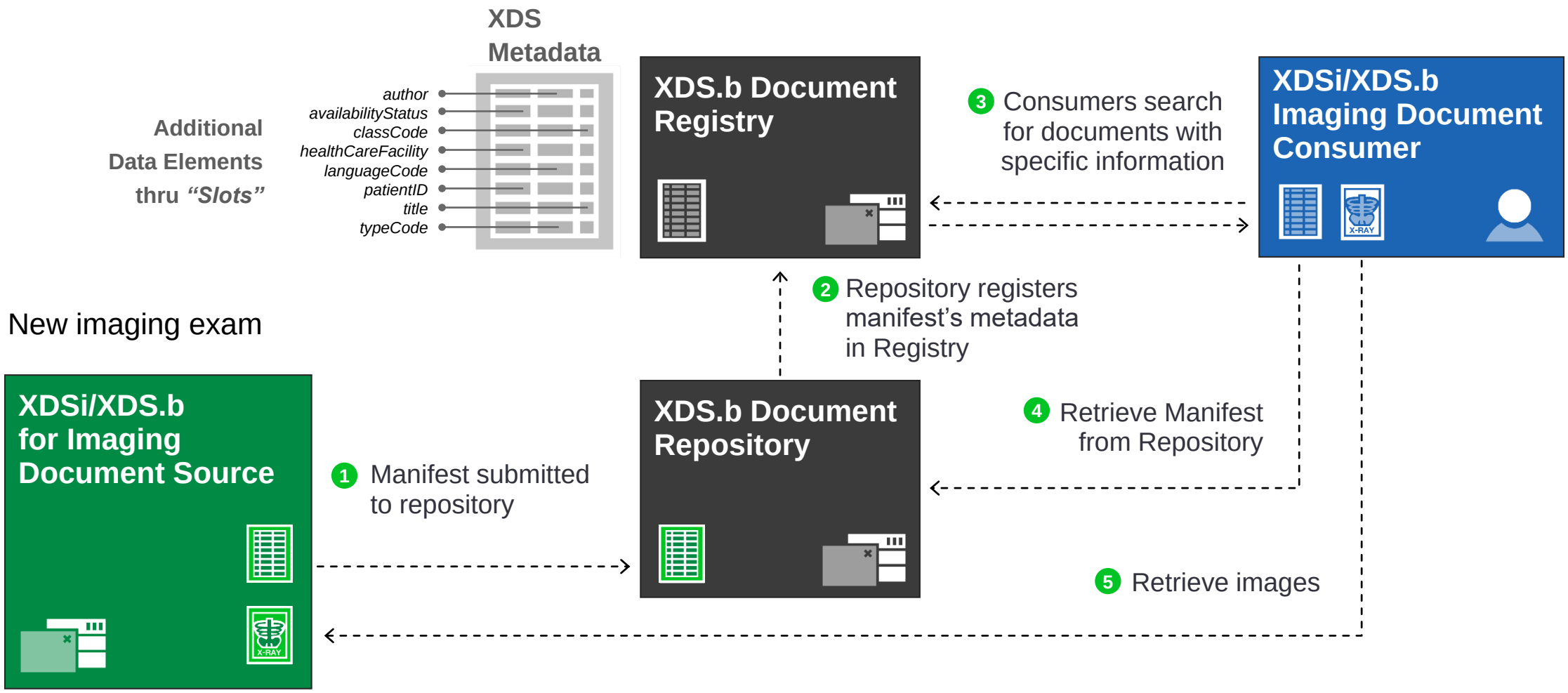
HL7 Clinical Document Architecture

Videos

MP4, MPEG-2 (theatre clips, endoscopy)

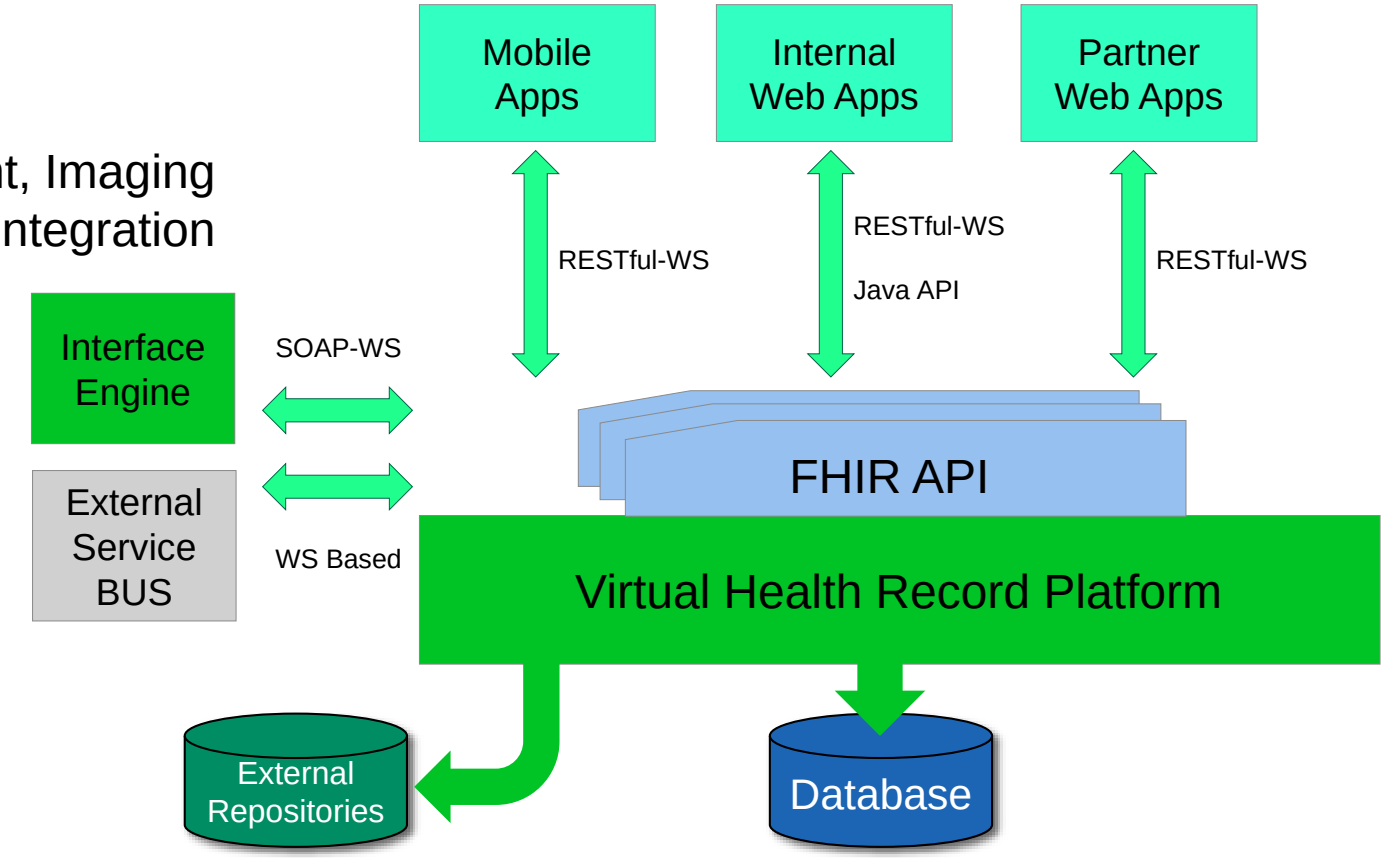
VNA XDS offering

XDSi (XDS.b for Imaging) basic workflow



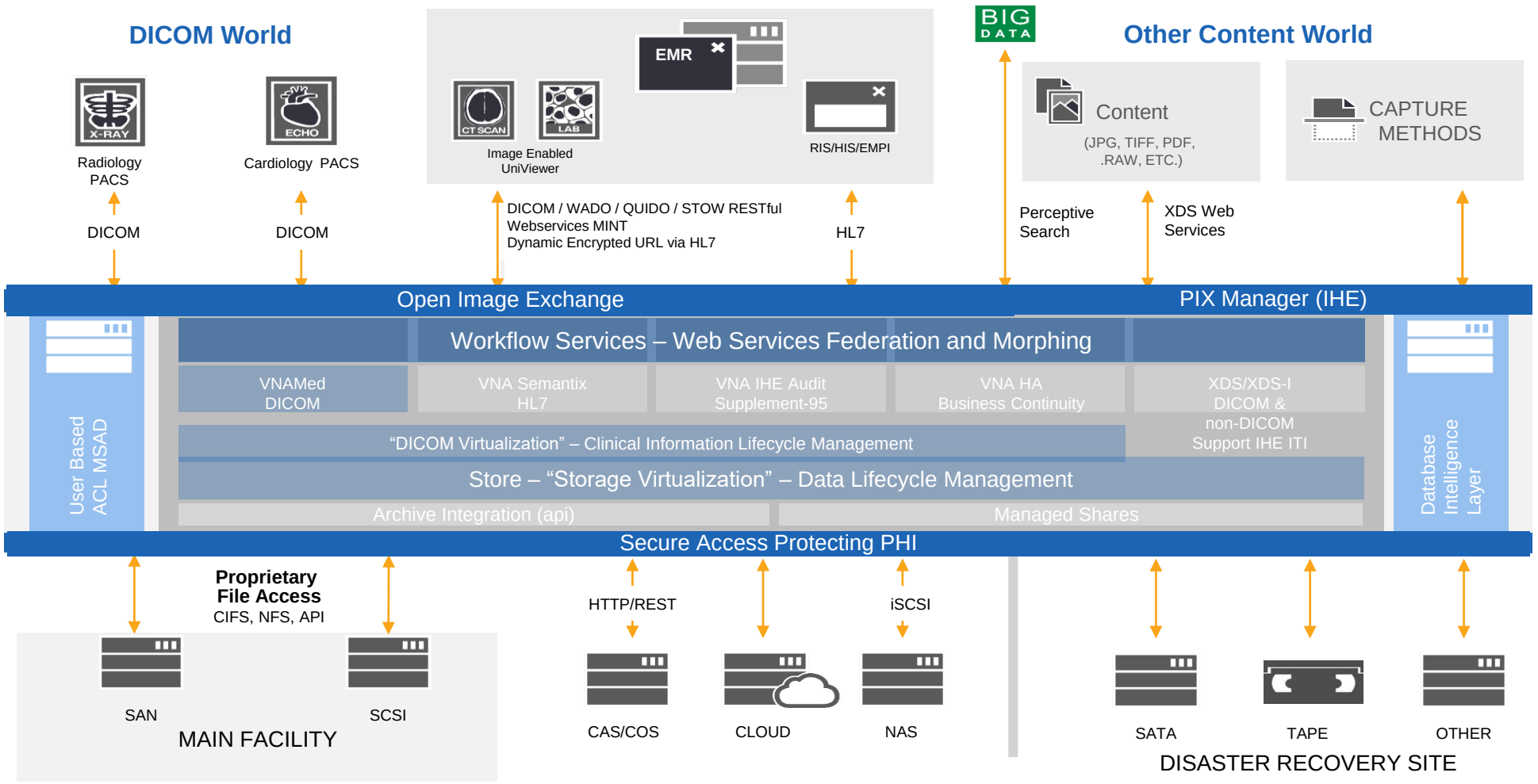
Simple FHIR Enabled Architecture

Messaging, Document, Imaging
Query-based Integration

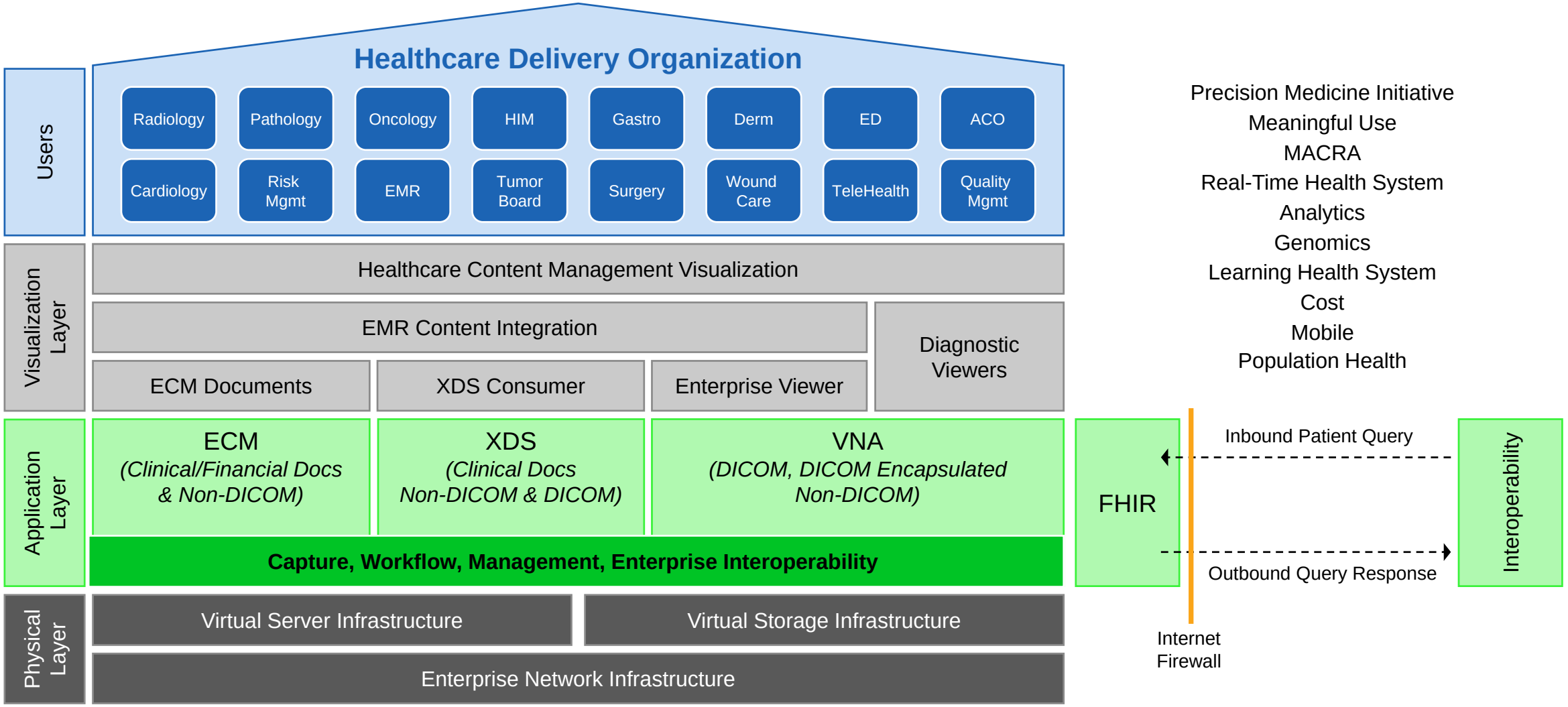


Lightweight
Restful
Service

Healthcare Content Management System



FHIR applied within an HCM platform



Integrating the Healthcare Enterprise “IHE”

IHE Integrating the Healthcare Enterprise

IHE XDS (Cross-Enterprise Document Sharing) Profile

- Foundational for a non-DICOM VNA strategy
- XDS-I is an integral part of a DICOM strategy
- XDS is considered an integral part of a True VNA
- All are critical for development of an Enterprise Imaging Strategy
- Vendors should test profiles with “PRODUCTION CODE”

IHE Profiles part of a “True VNA” platform

- XDS/XDS-I Registry/Repository
- PIX (Patient Identifier Cross-Referencing) Manager, eMPI functionality
- ARR (Audit Records Repository)
- DICOM Manager is also an XDS-I Source
- WADO (Web Access to DICOM Objects)
- DICOM Web (Family of restful DICOM services)
- Mobile Profiles using RESTful WS and FHIR
  - mPIX
  - mPDQ (Patient Demographics Query)
  - MHD (Mobile access to Healthcare Data) - NEW

RSNA Image Sharing

- First vendor group has certified
- XDS/XDS-I, PIX, XCA

IHE Conformity Assessment

- Formal Conformity Certification
- 15 IHE Profiles

IHE

- 3 Annual Connectathons
- Supporting Testing and Conformance

ONC

- Interoperability Pledge
- Formal CEHRT

Enterprise Exchange and Sharing Requirements

- **Collaboration**
  - Visually collaborate real-time
  - Eliminate need to exchange objects
  - 100% Zero-Client
- **Upload, & Download**
  - Ingestion and download of objects
  - DICOMDIR/ZIP/FOLDER/FILES, Non-DICOM & Unauthenticated Link
- **Print & Export**
  - Print to DICOM device or system print
  - Export Video, DICOM & Visible Light
- **Send to DICOM Destination and Eliminate CD Need & Faxing**
  - Route/send object to Networked target
  - ILM and/or direct send to AETitle
- **Authentication**
  - Blockchain
- **Ability to securely transfer objects via HTTPS**
  - Movement of objects to/from trusted organizations without VPN (ie: TeleHealth/TeleStroke)
  - DICOM Storage SCP “store-and-forward” proxy;
  - Transfer of DICOM data from remote using secure and reliable HTTPS based transport
- **Ability to send a link for access**
  - Authenticated users via email
  - Unexpected user access leveraging pre-defined & limited privilege group
- **Guest Access with ‘Break Glass’ Functionality**
  - Guest user access leveraging pre-defined & limited privilege group
  - Governed by client IT access tools & policy (ie physician portal, Network access, etc)

Questions for Discussion – What you should be thinking.

- How do you accomplish health information document exchange today? Have you developed an enterprise interoperability strategy?
- Are aware of ONC's Interoperability Pledge?
- Are your current EMRs capable of sharing information to meet current and future MU requirements?
- Are you concerned more about technical or process issues as they relate to developing greater interoperability?
- Are we approaching interoperability appropriately?
  - On a departmental basis?
  - On an enterprise basis?

Three Critical Thoughts

1. Require that your vendors have signed ONC's Interoperability Pledge!

   "Protects you against vendor lock and vendor block."

2. Buy at the Enterprise Level not the Departmental Level!

   "Integrating at the Enterprise Level can enhance expertise, eliminate information silos, and reduce costs."

3. Applications of Tomorrow have to Dynamically Discover and Ingest Clinical Content in Real-Time without requiring Data Persistence!