



HL7 and Interoperability

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HL7 Chief Technology Officer
November, 2016

Topics for Discussion

- HL7 Organization and Product Overview
- HL7 FHIR: the Path to Interoperability
- HL7's Roadmap to Next Generation Standards
- HL7 standards and IDMP

HL7: What Matters Most

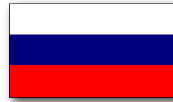
- HL7 Vision: A world in which everyone can securely access and use the right health data when and where they need it.
- HL7 Mission: to provide standards that empower global health data interoperability





Argentina

35 HL7 International Affiliates / Countries



Russia



Romania



Philippines



Serbia

Norway



New Zealand



Australia



Austria



Singapore

*And
ing*



Uruguay

United Kingdom



Brazil



South Korea



Bosnia and Herzegovina



Japan

Canada



Spain

China



Switzerland



Singapore

Italy



India



Croatia



Sweden



Slovenia



Taiwan



The Netherlands



Hong Kong



Czech Republic



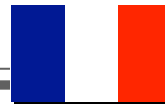
Denmark



Finland



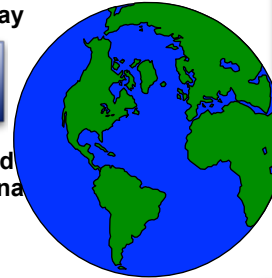
France



Germany



Greece



HL7 Major Product Lines

- **Version 2.x**
- Version 3 Reference Information Model-Based
 - Version 3 Messaging and services
 - **Version 3 Clinical Document Architecture (CDA)**
 - CDA Implementation Specifications or IGs (e.g., CCD)
 - Gello
 - Attachments
 - Regulatory standards (Structured Product Labeling, ICSR, RPS)
- EHR-S & PHR-S Set of Functional Profiles
- **FHIR (Fast Health Interoperability Resources)**
- Arden Syntax

Version 2.8.1 Content

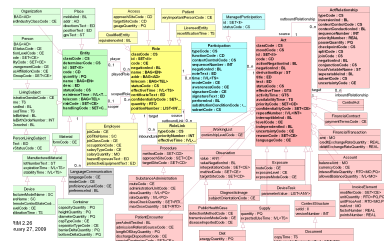


1. Introduction
 2. Control / Data Types / Conformance & Code Tables
 3. Patient Administration
 4. Orders
 5. Queries
 6. Financial Management
 7. Observations
 8. Master Files
 9. Medical Records / Information Mgmt
 10. Scheduling
 11. Patient Referral
 12. Patient Care
 13. Clinical Laboratory Automation
 14. Application Management
 15. Personnel Management
 16. Non-US eClaims (*new to 2.6*)
 17. Materials Mgmt. (*new to 2.6*)
- Appendices:*
- A. *Data Definition Tables*
 - B. *Lower Layer Protocol*
 - C. *BNF Definitions*
 - D. *Glossary*
 - E. *Index*

Version 3 and the RIM



Health Level Seven®
INTERNATIONAL



	Home	About	Standards	Membership	Resources	HL7 Store	Newsroom	Events	Training
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Introduction to HL7 Standards

Master Grid of Standards

Primary Standards

Foundational Standards

Clinical & Administrative Domains

EHR Profiles

Implementation Guides

Rules & References

Education & Awareness

Reference Information Model

ANSI Approved Standards

HL7 Standards Referenced in US Regulations

ISO Approved HL7 Standards

IP Policy

[Home](#) > [Standards](#) > [Product Brief](#)

Section 1: Primary Standards Section 3: Clinical and Administrative Domains

HL7 Version 3 Product Suite

DESCRIPTION

The Health Level Seven Version 3 (V3) Normative Edition—a suite of specifications based on HL7's Reference Information Model (RIM)—provides a single source that allows implementers of V3 specifications to work with the full set of messages, data types, and terminologies needed to build a complete implementation. The 2015 Normative Edition represents the seventh publication of the complete suite of V3 specifications, and contains those Version 3 Standards that are ANSI Approved, those that have passed Normative Level Ballot and are awaiting final ANSI Approval, and Draft Standards for Trial Use (DSTU). It includes standards for communications that document and manage the care and treatment of patients in a wide variety of healthcare settings. As such, it is a foundational part of the technologies needed to meet the global challenge of integrating healthcare information, in areas such as patient care and public health.

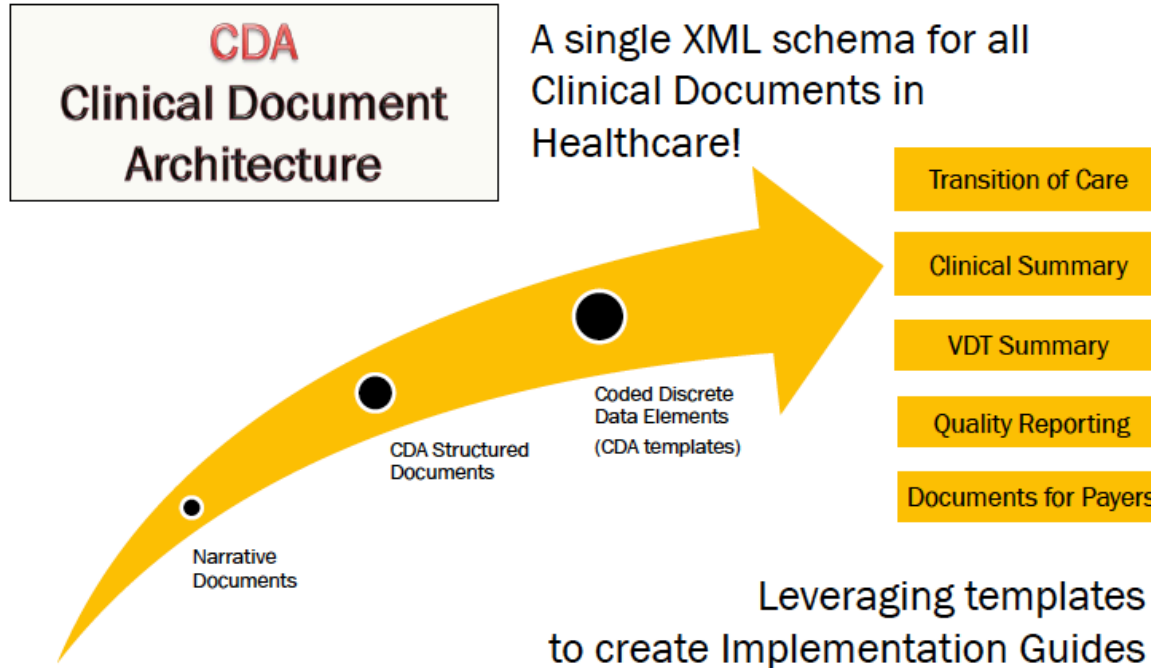
The Version 3 Normative Edition represents a new approach to clinical information exchange based on a model driven methodology that produces messages and electronic documents expressed in XML syntax. The V3 specification is built around subject domains that provide storyboard descriptions, trigger events, interaction designs, domain object models derived from the RIM, hierarchical message descriptors (HMDs) and a prose description of each element. Implementation of these domains further depends upon a non-normative V3 Guide and normative specifications for: data types; the XML technical specifications (ITS) or message wire format; message and control "wrappers", and transport protocols.

Members can access the latest [Normative Edition online](#).

TARGETS

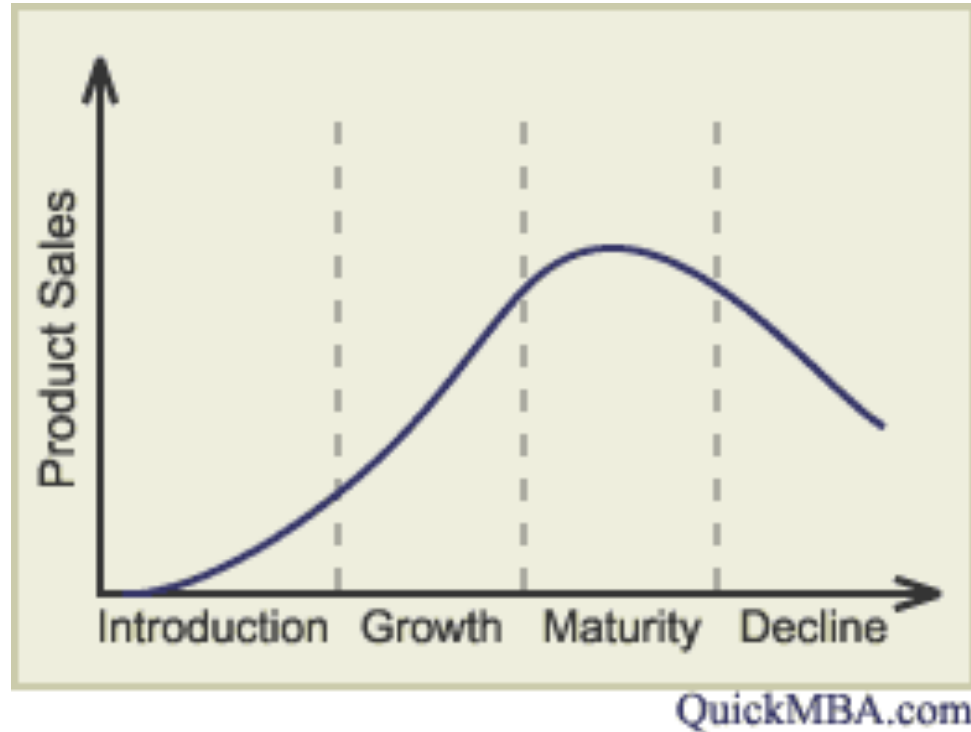
- All US and International Healthcare Industry Organizations and Companies

HL7's CDA



The Consolidated CDA is an IG that specifies a library of document templates

Product Lifecycles



QuickMBA.com

Fast Healthcare Interoperability Resources - FHIR

- The principles underlying FHIR development are meant to address the challenges learned in 30 years of standards development.
- FHIR was born when Fresh Look asked “What would interoperability look like if only we could start over while still building on our experience?”



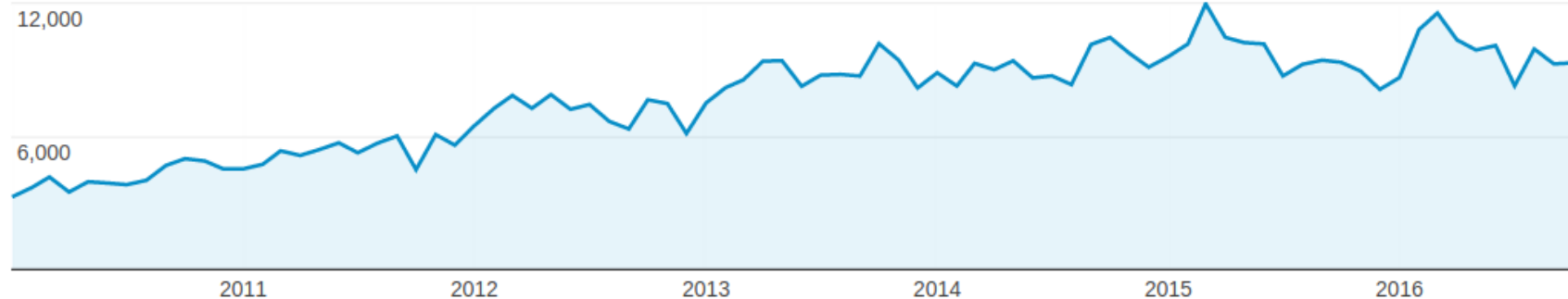
What is FHIR? - The Basics

- A next generation standards framework and platform combining the best features of previous HL7 standards, designed for rapid, agile implementation
- Flexible outputs: messages, documents, services
- Modern technologies for many contexts
 - RESTful Services used by Facebook, Twitter, etc.
 - Supports push and pull, CRUD operations
- Supports web security specifications (OAuth2; OpenID)
- Resources: modular components that can be easily assembled into working systems
 - Focus on core 80%; allow for controlled extensions
 - FHIR profiles to address specific use cases.

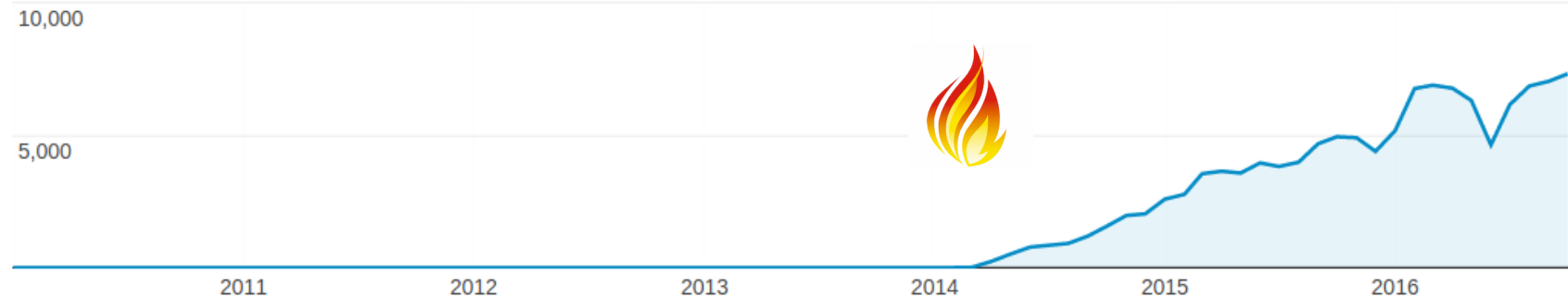


HL7 v2

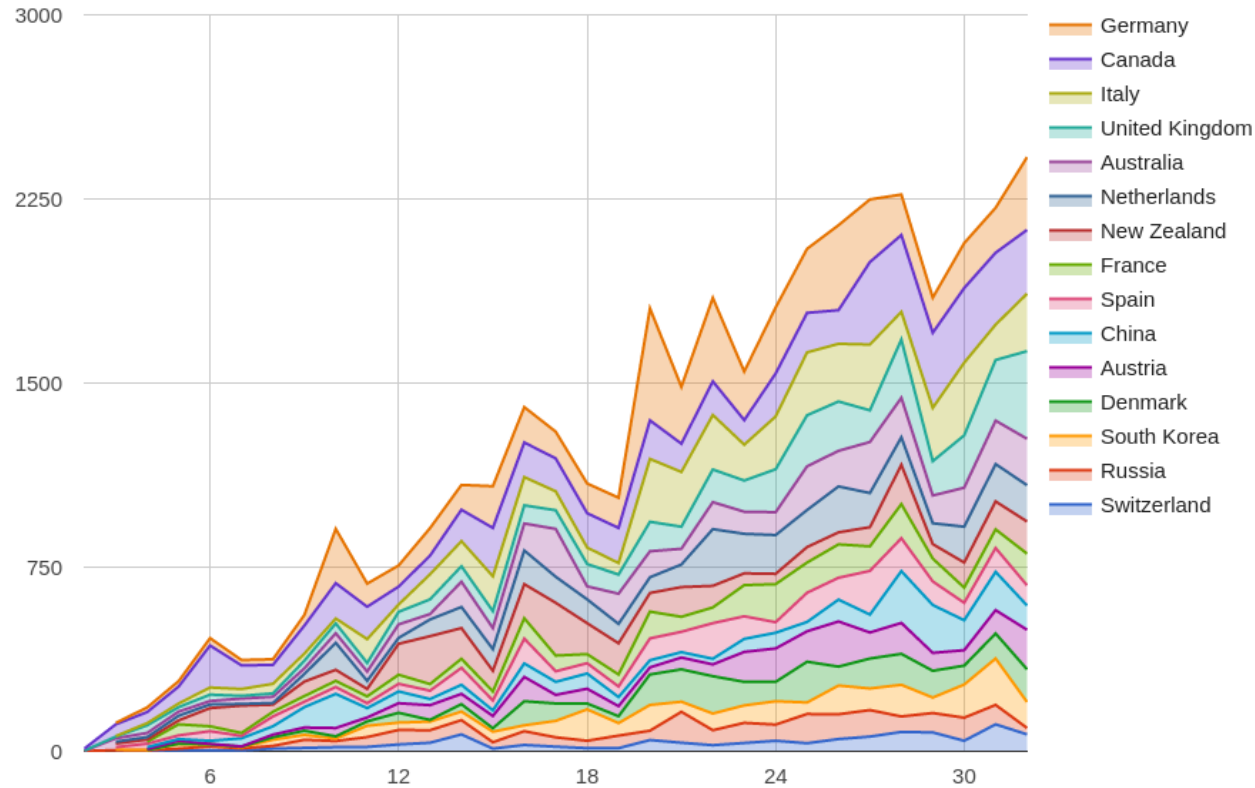
● Sessions



● Sessions



Top 15 Countries - Excludes US & India (X-axis is 36 months to Nov 16)



FHIR Resources

- ✓ Small logically discrete units of exchange
- ✓ Smallest unit of transaction “of interest” to healthcare



Principles of FHIR

- Data resides at the source of truth
- APIs access data: *pull* what you need, instead of only getting what's *pushed*
- Focus on implementers
- Include rigorous semantics
- Design for the common 80%; extensions for the rest
- Off-the-shelf security and authorization
- Speed, scalability, ease of understanding
- Everything is human readable, open and free.

FHIR supports Lookup and Queries from EHRs





Report to Congress

November 2016

2016 Report to Congress on Health IT Progress: Examining the HITECH Era and the Future of Health IT

- The (ONC Annual) report specifically calls out Health Level Seven International's emerging Fast Healthcare Interoperability Resources (FHIR) standard for the electronic exchange of health care information.
- "FHIR API access seeks to provide seamless transmission of electronic health information from a health system to consumers or the app that the consumer chooses," according to ONC. "FHIR is suitable for use in a wide variety of contexts—mobile phone apps, cloud communications, EHR-based data sharing, and server communication in large institutional healthcare provider organizations."

Argonaut Project Origins

- JASON Task Force recommendations on market-based interoperability governance and coordination, and call to action on “public APIs”
- Market experience with MU 2 and associated certification
- Swing responsibility for interoperability to private sector providers and vendors

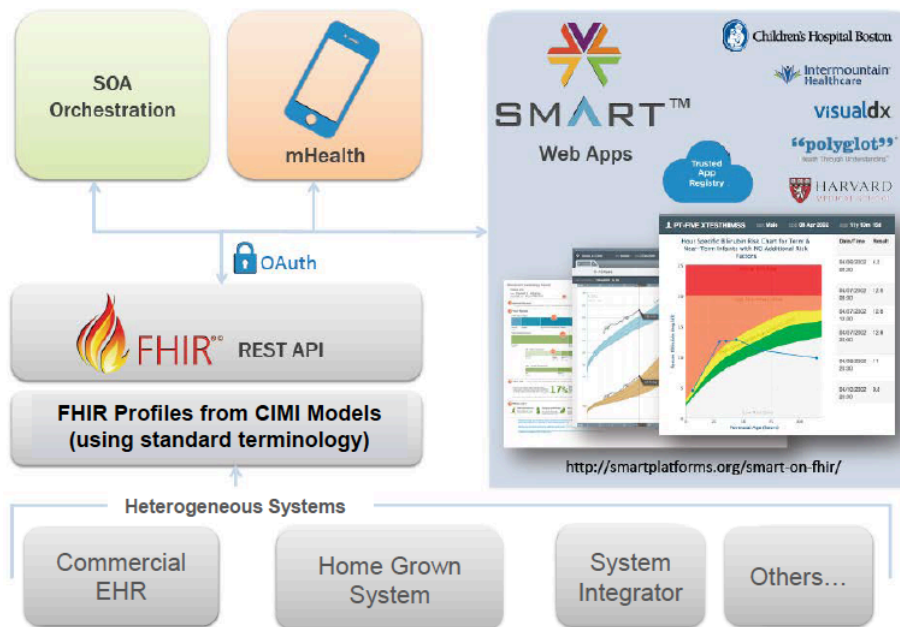
The Argonaut Project is a market-initiated code and documentation sprint to accelerate the market readiness of open industry FHIR-based APIs for patient- and provider-driven interoperability use cases

Source: Micky Tripathi



SMART on FHIR

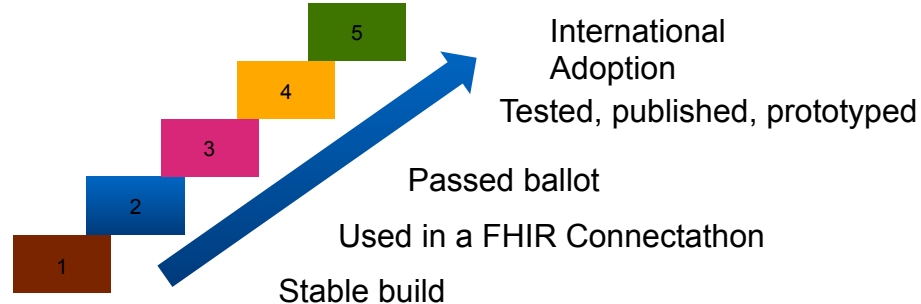
SMART on FHIR® – Open Platform Architecture



Source: Josh Mandel

The FHIR Maturity Model

Allows developers to assess the stability of FHIR components and realize the value of FHIR incrementally as it evolves



The Current State of FHIR

- STU3 Ballot comments (~1500) currently undergoing reconciliation
 - Goal is to publish STU3 in Feb. 2017
 - Resources and FHIR Profiles moving up in maturity
- Release 4 ballot (in late 2017) will include normative content (infrastructure/framework, some resources (e.g., patient, observations, diagnostic report))
- Argonaut IGs to be published by end of year
- Exploring plans for credentialing developers and certifying implementations.

*“A standard is not used because we created it.
It is a standard because people use it.”*

More than three hundred
clinical organizations, IT developers,
government agencies and healthcare
systems *worldwide* are now
committed to developing FHIR
applications





FHIR: Agile & Open Source Community



Tools Education DevDays Consulting

FHIR Tools

Furor's FHIR tools help you make a headstart with FHIR and manage your FHIR interoperability projects. All tools are freely available.



SPARK

SPARK is the open source .NET FHIR Server for testing purposes. Simplifier.net, the FHIR registry, runs on SPARK.

[Learn more](#)



Forge

Forge is the official HL7® FHIR® tool for managing conformance resources (FHIR Profiles). Free download.

[Learn more](#)



SPRINKLER

SPRINKLER is the .NET open source tool for FHIR server testing.

[Learn more](#)



FHIR API

Furor is the main contributor to the official .NET reference implementation (API) for FHIR clients and FHIR servers.

[Learn more](#)



HSPC Developers SMART®

Write once. Deploy anywhere.

With HSPC & SMART on FHIR, building interoperable apps for health has never been easier.



Download our FHIR® "Technology Preview 2" now

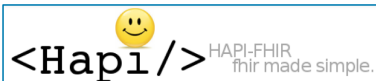
Use our new "Fast Healthcare Interoperability Resources" (FHIR) Listener Connector to:

- Start learning about FHIR
- Begin hosting your own FHIR interfaces with Mirth® Connect
- Provide feedback and drive the evolution of our FHIR support

Easily kick-start your new interface with Mirth® FHIR Technology Preview 2.

[DOWNLOAD NOW](#)

View our public Wiki site to access the user guide, a channel example, and to read more about this exciting technology preview.



This is the homepage for the HAPI-FHIR library. We are developing an open-source implementation of the FHIR specification in Java. FHIR (Fast Healthcare Interoperability Resources) is a specification for exchanging healthcare data in a modern and developer friendly way.

Note that this is the home for the FHIR version of HAPI. If you are looking for HL7 v2 support, [click here](#).

 [Demonstration/Test Page](#)

A public test server is now operating at <http://fhirtest.uhn.ca>. This server is built entirely using components of HAPI-FHIR and demonstrates all of its capabilities. This server is also entirely open source. You can host your own copy by following instructions on our [JPA Server](#) documentation.

Upcoming FHIR Events

- FHIR Development Days, Amsterdam Nov. 16-18
- Next FHIR Connectathon Jan 14-15, San Antonio (b4 next HL7 Working Group Meeting)
- Next FHIR Apps Roundtable March 6-7 (Duke University, Durham NC)
- Next Partners in Interoperability (March 23-24 (Georgia Tech University, Atlanta,

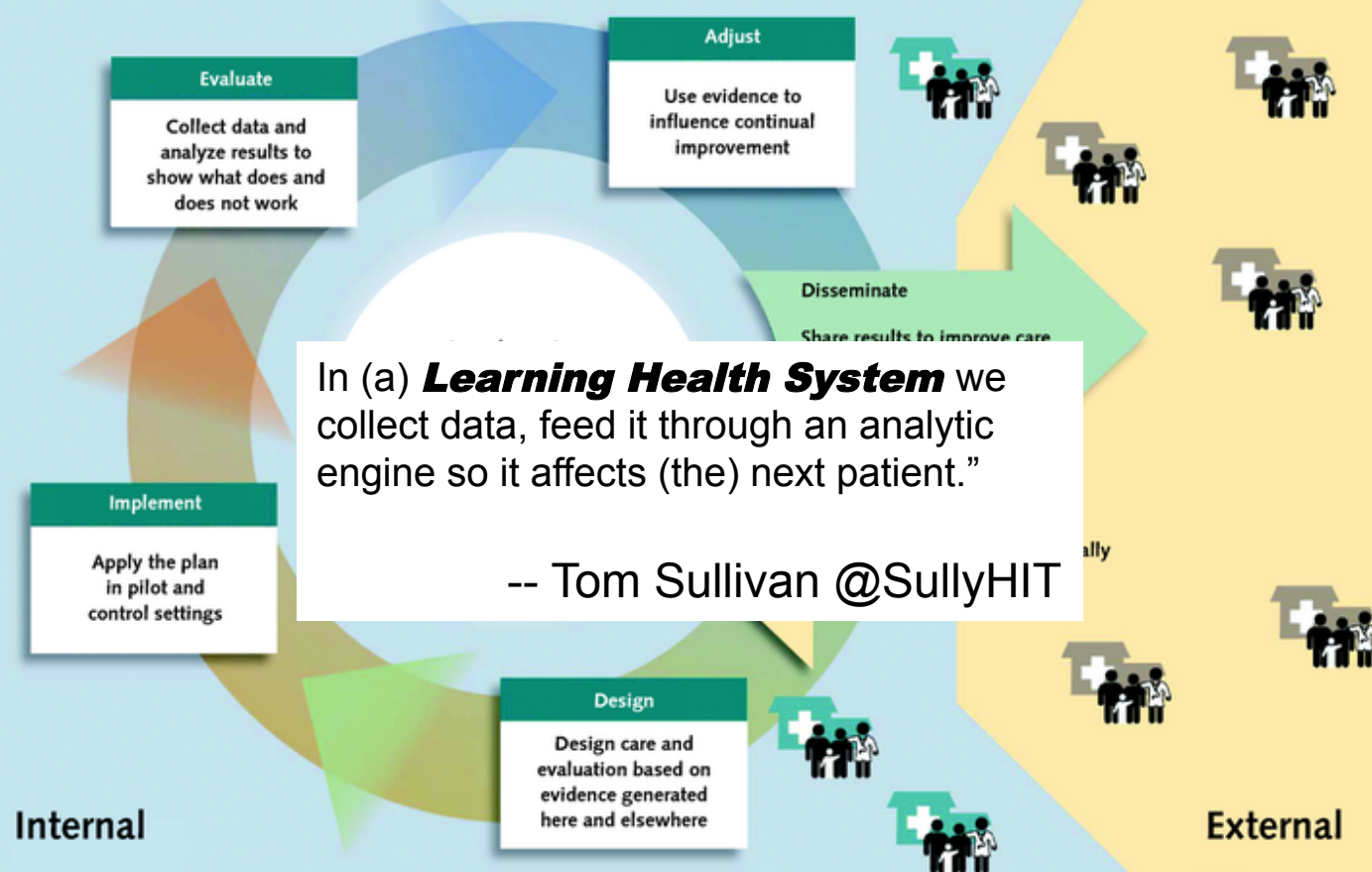
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“FHIR is the HTML of Healthcare.”

--John Halamka MD
Chief Information Officer of the Beth Israel
Deaconess Medical Center,
Chief Information Officer and Dean for
Technology at Harvard Medical School

HL7 Roadmap to Next Generation Standards

- HL7's roadmap to the next-generation of HL7 standards will incorporate the best of FHIR, v2, CDA and v3, including:
 - A single vocabulary management process
 - A migration path from v2, v3 and CDA
- Future efforts primarily based on FHIR principles and agile, implementation approach
 - Though technologies may evolve over time
- Support for older standards will be maintained as needed for installed base.



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HL7 Standards and IDMP

- Existing v3-based standards are still in adoption phase
- FHIR-based solutions will take commitment by standard developers, implementers and customers
- FHIR solutions are best approached incrementally in small packages which will have broadest potential adoption
- A mapping approach is best current option.



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