The Future of Health Data Interoperability is on FHIR: the Argonaut Project

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The principles underlying
FHIR development
are meant to address the challenges
learned in
30 years of
standards development.

"If I had more time,
it would have been shorter."

Mark Twain

Here are some principles
we learned the hard way.
I think they are the best kind
of lessons.

Interoperability Requires
5 Things we need to standardize

- Meaning

- Content structure

- Transport

- Security

- Services

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

"I can't understand why people are frightened of new ideas.
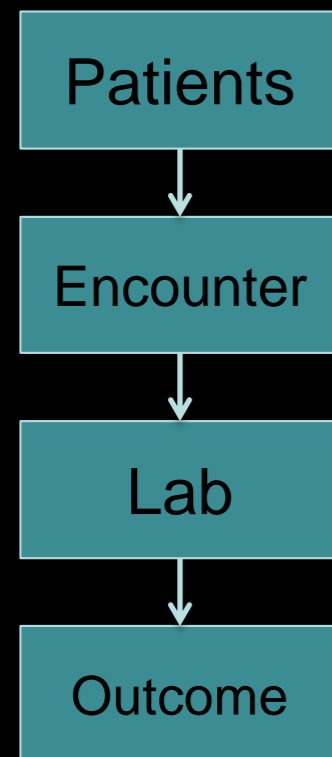I'm frightened of the old ones."

John Cage

Government regulation only codifies standards. Standards bring value when they are adopted in the marketplace.
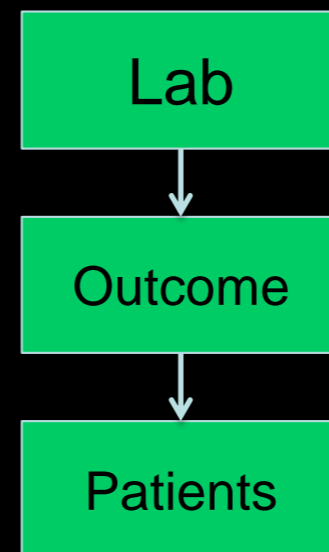
For information models, one size never fits all.

Same information… different information model
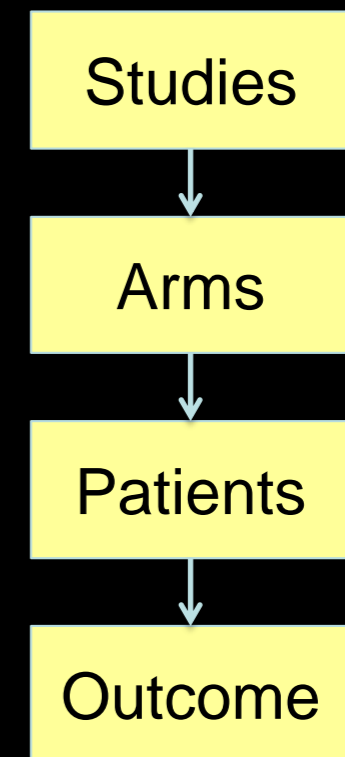
Patient Care

Patients → Encounter → Lab → Outcome

Data Analytics

Lab → Outcome → Patients

Clinical Trials

Studies → Arms → Patients → Outcome

The only standard that
never changes
is the standard you never use.

There is an inherent
Standards Life Cycle,
either stated or implied.

The entire community of stakeholders
rely upon that knowledge.

Emerging standards require a Maturity Model.

Mature standards need a timeline for enhancement or sunsetting.

These principles coalesced around the Fresh Look initiative…

…and out of it emerged FHIR.

Fast Healthcare Interoperability
Resources

"You can accomplish anything in life, if you don't mid who gets the credit."

Harry Truman

What makes FHIR fast?

Faster to learn
Faster to develop
Faster to implement

HL7 FHIR

If FHIR is to satisfy
any business needs,
there are just a few terms
we will all have to agree upon.

FHIR is composed of reusable resources*

*Built on an information model, without the need for implementers to know or learn the model or modeling.l

Resources are
the smallest unit of transaction,
logically discrete,
with defined behaviour and
meaning,
and known identity and location.

FHIR was developed from modern web technologies and RESTful services.*

* And familiar web specifications like XML, JSON, HTTP, Atom, OAuth.

FHIR relies upon the rule of 80/20*

*And, we're sticking to it.

"Perfection is achieved,
not when there is nothing
more to add,
but when there is nothing left
to take away."

Antoine de Saint-Exupery

Extensions are
"what happens"
when the rule of 80/20
does not satisfy the
clinical requirements

The Business Case for Extensions

- Extensions are a problem

- They are even worse when poorly described and carelessly done

- W3C rules: must interoperate without extensions [This is *not possible* in healthcare]

- 2 Choices: design for absolutely everything or allow extensions

FHIR Extensions

- FHIR has a standard extension framework

- Every FHIR element can be extended

- Every extension *must have*

  Reference to a computable definition

  Value, from a set of known types

- Every system can read, write, store and exchange all legal extensions

- All extensions are valid by schema

FHIR
makes no assumptions
about the
Architecture of the system

FHIR
supports leading specifications* for Privacy & Security

* OAuth2 & OpenID

FHIR solutions are
human-readable

Profiles are a statement of use of one or more FHIR Resources, and may include *constraints* on resources and data types, terminology binding and extensions

FHIR supports
EHR Lookup and Queries

FHIR enables an
evolutionary
development path
with
other HL7 standards*

* Many are embedded in Federal regulation

FHIR focuses on implementation*

* and implementers

FHIR also supports application development for

- Mobility & Mobile Health
- Social Media
- Personal Health Records
- Public Health
- Payment Systems
- Clinical Research

FHIR development
is global*

FHIR development workshops in UK, Canada, Australia, Netherlands, Argentina, and Japan…as of Monday.

"FHIR is the HTML of Healthcare."

John Halamka, MD

FHIR Maturity Model

5 stages of development
that estimate
market readiness

FHIR
is
Free

* The FHIR name and logo are trademarked, but the specification is licensed without restriction or royalty.

JASON
Task Force
&
the Argonauts

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

Argonaut Project Members

Accenture
athenahealth
Beth Israel Deaconess Medical Center
Cerner
Epic
Intermountain Healthcare
Mayo Clinic
Meditech
McKesson
Partners HealthCare System
SMART at the Boston Children's Hospital
Surescripts
The Advisory Board Company

"How much easier it is to be critical than correct."

Benjamin Disraeli

Argonaut Phase I

* Accelerate the development of the FHIR specification for the balloting of the Draft Standard for Trial Use (DSTU) Release 2

* Support the creation of a community of FHIR implementers

Argonaut Phase I

* FHIR data-level API

* MU Common Dataset resources/profiles
   & document-level APIs

* Argonaut Implementation Guide

Argonaut Security Phase I

- Final Use Case document

- Risk Assessment Report

- Argonaut SMART on FHIR Authorization Profile

"If I had asked my customers what they wanted, they would have asked for a faster horse."

Henry Ford

Argonaut Phase II

* Support the development of resources for a FHIR implementation registry, FHIR conformance testing, and a robust source of stable resources and artifacts.

* Complete the development of reliable specifications for security and authorization

Argonaut Phase II
FHIR Development

* Publish Argonaut Implementation Guide

* Enhance specifications

* Develop constraints on resources, profiles, and queries to satisfy operational demands

Argonaut Phase II
FHIR Development Enhancements

* *Iterative* testing & enhancement program

* FHIR.org web site

* Add data elements for CCDA & MU3

* Augment Security Services to include AuditEvent, Provenance, Consent

* Add Terminology Services

Argonaut Phase II
Security Development

* Extend specification and
    Implementation Guides
    to enable inter-system authorization

Argonaut Phase II
Security Development Enhancements

* Provide Inter-system risk assessment

* Enable Direct coordination

* Enhance SMART on FHIR

* Enhance EHR-EHR authorization profile

* Develop guides for Server implementation

Argonaut Phase II
Implementation Program

* Formalize implementation program

* Develop focused sprint initiatives

* Implement testing tooling & artifacts

* Publish test results for internal and external audiences

Argonaut Phase II
Implementation Program Support

* Provide Argonaut *Test Server*

* Maintain *implementers* test outcomes site

* Enhance testing tooling for resources,

   profiles & solutions

* Deploy virtual Help Desk

* Provide in-person testing program

Argonaut Implementation Program

To date, there are over 150
healthcare systems, vendor companies,
academic institutions, government agencies,
pharmaceutical companies, payer
organizations, and independent developers
committed to
supporting and implementing
solutions based upon FHIR specifications.
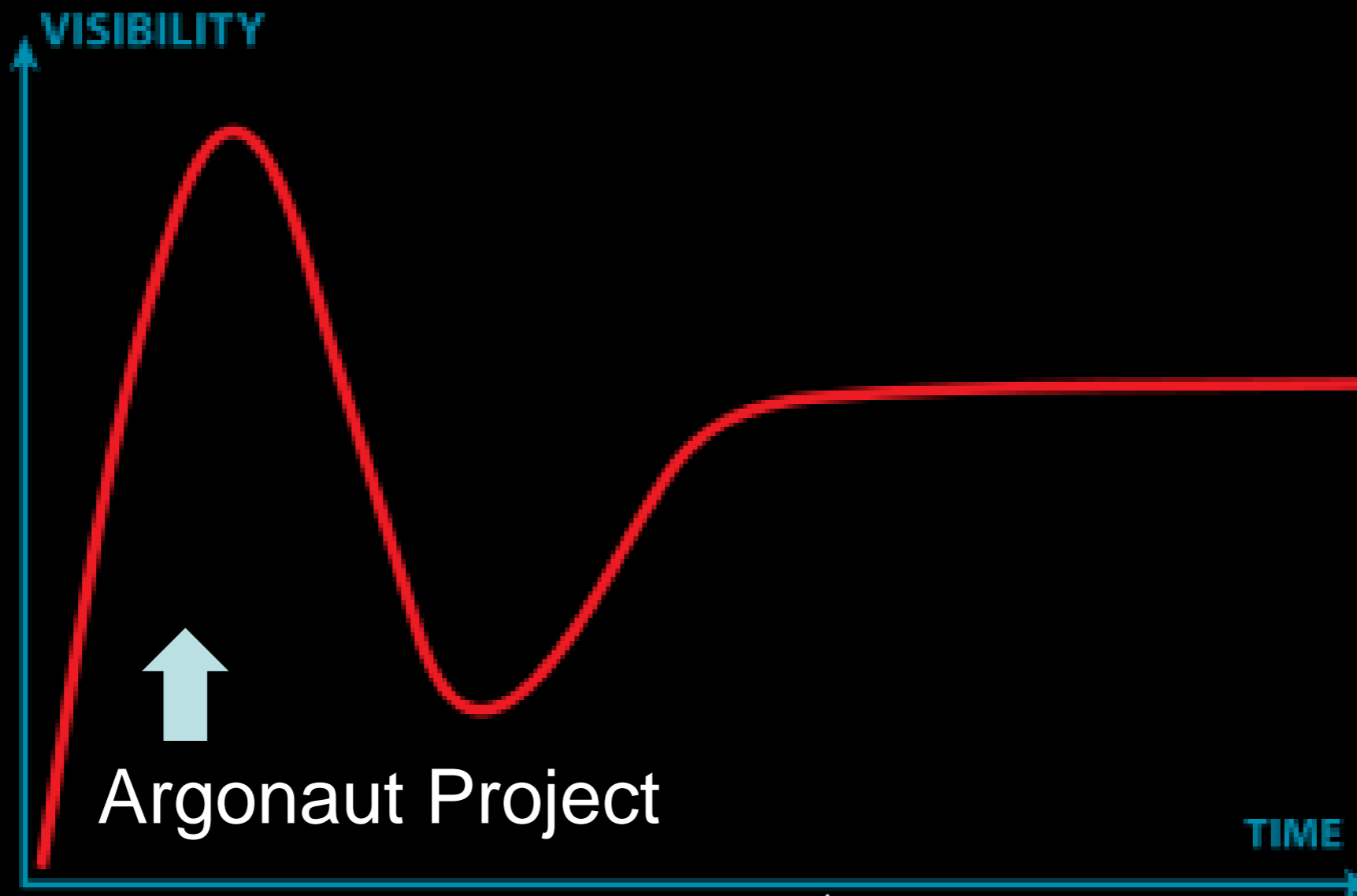
FHIR.ORG Web Site

- Home for the Implementation Community

- Implementation Registry

- Reference implementations & Task tracking

- Community Forum

- Resources for conformance testing and public reference implementations

A gentle word of caution about FHIR

"We can't solve problems with the same kind of thinking when we created them."

Albert Einstein

FHIR sorely needed international
initiatives to support
the Argonaut Implementation programs

SMART on FHIR

SMART is a 6-year project at Boston Children's Hospital, funded by ONC, based upon an API model to enhance health data interoperability

SMART has adopted FHIR as its standards-based API model

The goal of SMART is the creation of an "App Store" for healthcare

CIMI
Clinical Information Modeling Initiative

Like FHIR, CIMI was the product of the HL7 Fresh Look Task Force

CIMI provides a unique opportunity to populate clinical model into FHIR

Effective October 2015, CIMI will become an HL7 Work Group

HSPC
Health Services Platform Consortium

HSPC facilitates clinical application interoperability and data sharing by defining open, standards-based (HL7 FHIR, SNOMED, LOINC) specifications for enterprise clinical services and clinical applications.

HSPC vision is the creation of an "app store" for the distribution of interoperable and shareable clinical applications.
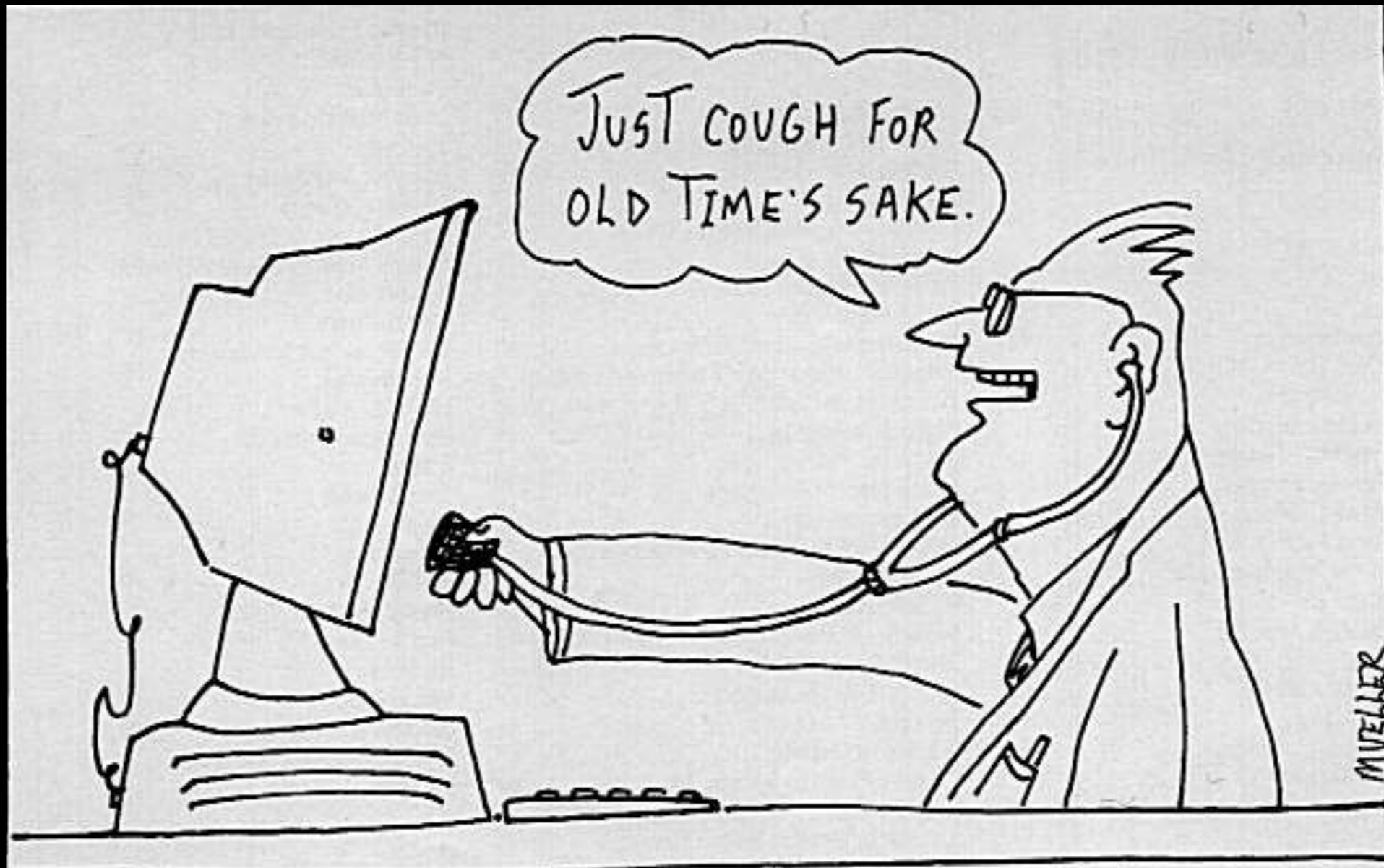
Special Thanks

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Micky Tripathi

Grahame Grieve

Thank you

cjaffe@hl7.org

Additional Resources

Access to More FHIR Information

FHIR on Twitter
@FHIR   #HL7 #FHIR

FHIR news
@FHIRNews

FHIR Standard – Free access
www.FHIR.org

FHIR Wiki
http://wiki.hl7.org/index.php?title=FHIR

FHIR Training Videos
https://vimeo.com/channels/hl7fhir

FHIR Maturity Model

0: Resource or Profile published

1: WG determination that the artifact is ready for implementation

2: Artifact has been test and exchanged by at least 3 independent systems

3: Artifact meets *DSTU Quality Guidelines* and undergoes formal balloting

4: Artifact has been tested, published, & implemented in multiple prototype projects

5: Artifact has been implemented in at least 5 in production systems in more than one country