

# HL7 FHIR®

Out-of-the-box eHealth  
interoperability

*& JSON of Argonaut Fame*

*Ewout Kramer [e.kramer@furore.com](mailto:e.kramer@furore.com) &  
John Quinn HL7 CTO*



# Fast

(well, that's relative)

# Healthcare

# Interoperability

(that's what we need)

# Resources

(the web technology bit)



# FHIR

- FHIR is about:
  - Implementation
  - Current state-of-the-art application development across multiple popularly used platforms (e.g., IOS, Android, etc.)
  - Pushing and *PULLING* data.

# HL7 FHIR®

- HL7 is a Standards Development Organization accredited under the American National Standards Institute (ANSI).
- The HL7 ballots and publishes documents that eventually are published as HL7 Standards. Some of these published Standards are then balloted and listed as ISO TC-215 Standards.

## HOW STANDARDS PROLIFERATE:

(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC)

SITUATION:  
THERE ARE  
14 COMPETING  
STANDARDS.

14?! RIDICULOUS!  
WE NEED TO DEVELOP  
ONE UNIVERSAL STANDARD  
THAT COVERS EVERYONE'S  
USE CASES.



SOON:

SITUATION:  
THERE ARE  
15 COMPETING  
STANDARDS.

# FHIR<sup>®</sup> Manifesto (abridged)

- If your neighbor 's son
- Can't hack an app with it
- Learn in a weekend.....
- Make content freely available

you won't get adopted

**“How can I get data from  
my server to my iOS app?”**

**“How do I connect my applications  
using cloud storage?”**

**“How can I give record-based  
standardized access to my PHR?”**

**cars2go** Make a Reservation

See what vehicles are available and make a reservation

San Francisco, CA San Francisco, CA

Select Pick-Up Location: San Francisco, CA

Select Drop-Off Location: San Francisco, CA

Vehicle Type: Small Car

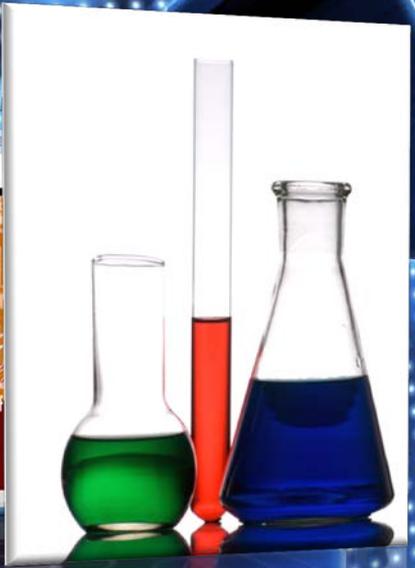
Pick-up Date/Time: 09/01/2007 12:00 PM

Return Date/Time: 09/03/2007 12:00 PM

Show Availability

| SEPTEMBER 2007       | OCTOBER 2007           | NOVEMBER 2007        |
|----------------------|------------------------|----------------------|
| S M Tu W Th F S      | S M Tu W Th F S        | S M Tu W Th F S      |
| 1 2 3 4 5 6 7        | 1 2 3 4 5 6 7 8        | 1 2 3 4 5 6 7 8      |
| 8 9 10 11 12 13 14   | 9 10 11 12 13 14 15 16 | 9 10 11 12 13 14 15  |
| 15 16 17 18 19 20 21 | 16 17 18 19 20 21 22   | 16 17 18 19 20 21 22 |
| 22 23 24 25 26 27 28 | 23 24 25 26 27 28 29   | 23 24 25 26 27 28 29 |
| 29 30                | 30 31                  | 30 31                |

San Francisco 400 Market St., Suite 300 San Francisco, CA 94102  
Tel: 415.555.4000 Fax: 415.555.2000



# REST



## Services Directory

Subscribe to get the latest APIs

Sort by:

100 of 5716 APIs

Previous **1** 2 Next

| Description                              | Category  | Updated    |
|--|-----------|------------|
| Social network integrated webshops       | Shopping  | 2012-04-19 |
| Dating service based on music interests  | Music     | 2012-04-19 |
| Interactive voice response phone service | Telephony | 2012-04-19 |
| Music sharing service                    |           |            |
| Library catalog search                   |           |            |
| Searchable recipe collection REST API    |           |            |
| Statistical soccer data                  |           |            |
| Android app organization                 |           |            |
| Thirukkural reference                    |           |            |
| Cloud hosting service                    |           |            |
| Clinical research management             |           |            |

# Highrise API

### Tasks

Tasks either use the general frame tag, like the example below with "today", or they'll use the specific due-at tag if they have a set time and specific day as well.

### Show

**GET /tasks/{id}.xml**  
Returns a single task.

### Response

```

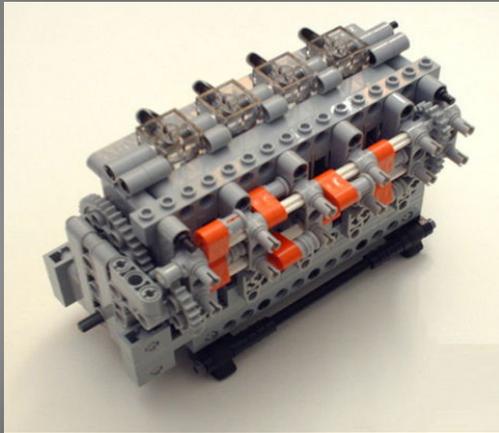
Status: 200 OK
<task>
  <id type="integer">1</id>
  <recording-id type="integer"></recording-id>
  <subject-id type="integer"></subject-id>
  <subject-type></subject-type>
  <subject-name></subject-name>
  <category-id type="integer"></category-id>
  <body>A task for today</body>
  <frame>today</frame>
  <due-at type="datetime"></due-at>
  
```

Thirukkural

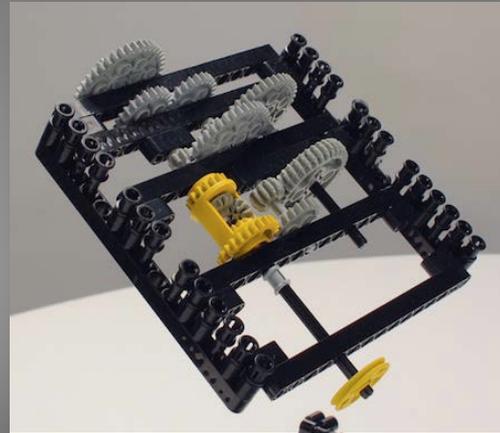
Hostway FlexCloud

Medidata Rave

Slice & dice your data into “resources”

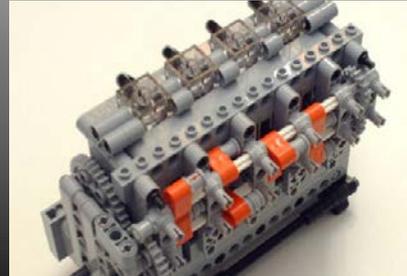
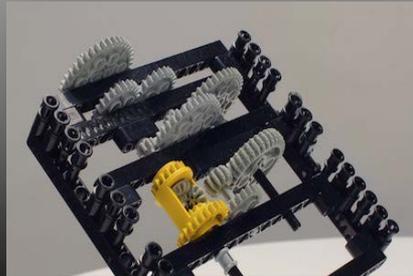
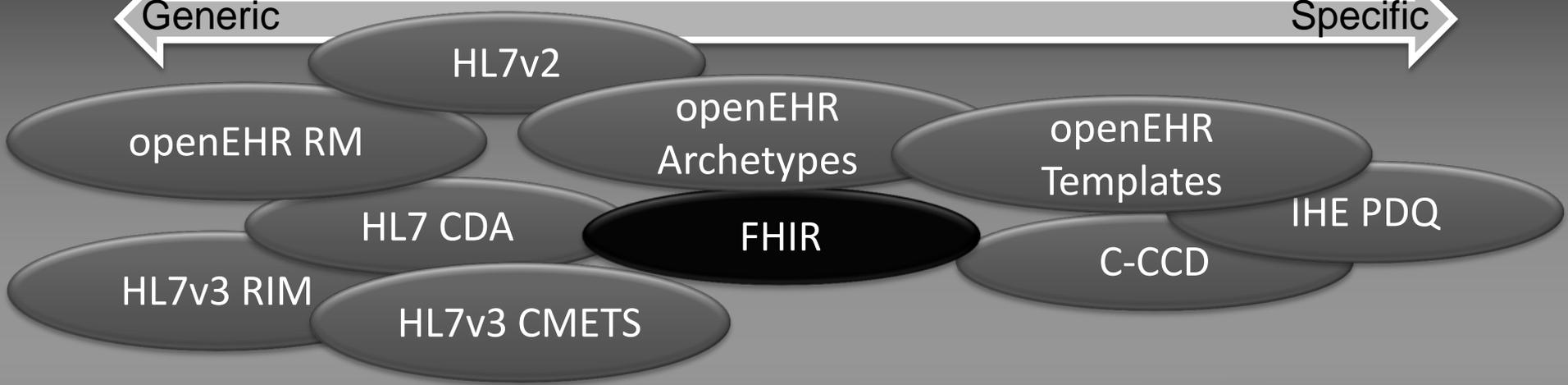


MedicationPrescription



Problem

# Cover all usecases - (n)ever

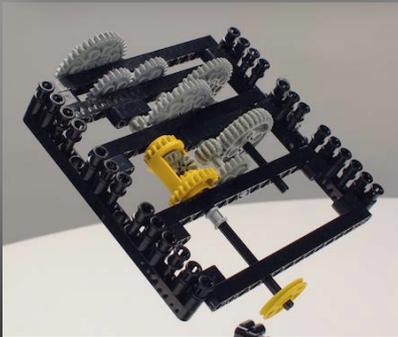
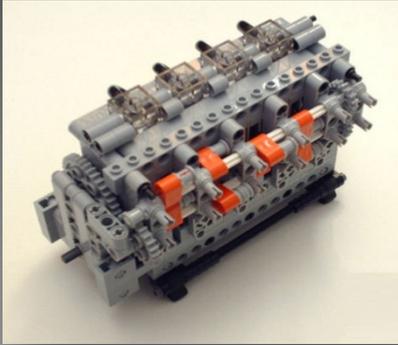


or shorter:

“The more re-usable a standard.....  
...the less usable it is”

(What is more useful are the tightly defined and widely distributed implementation guides based on specific uses of the standard)

Cover the 80% out of the box...



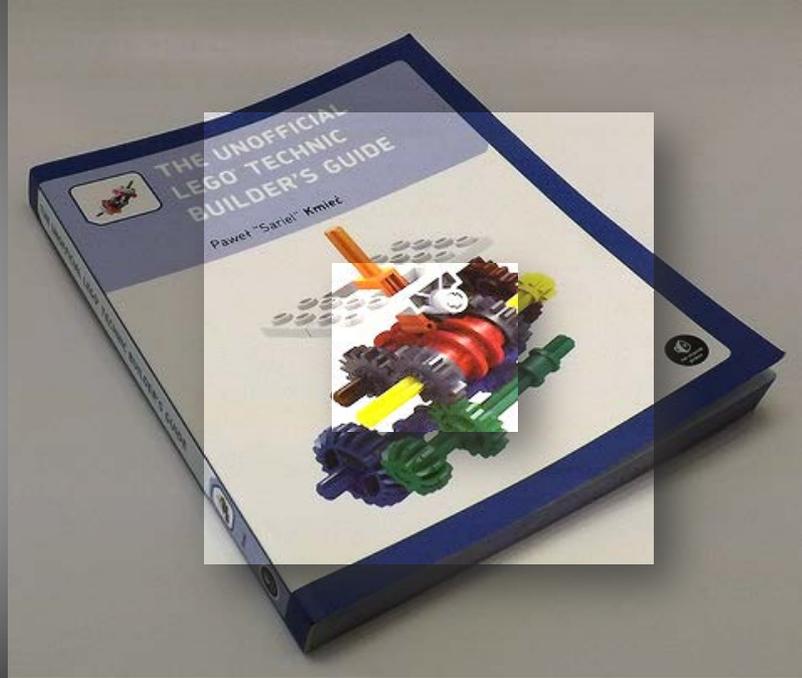
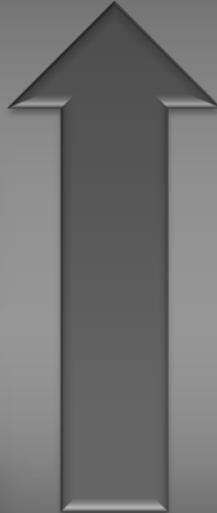
+



=



# Support “Bottom-up re-use”



# Document from the resource to the wire

```
<Person xmlns="http://hl7.org/fhir">
  <name>
    <use>usual</use>
    <given>Jim</given>
  </name>
  <telecom>
    <system>phone</system>
    <value>(03) 5555 6473</value>
    <use>work</use>
  </telecom>
  <gender>
    <system>http://hl7.org/fhir/sid/v2-0001
    <code>M</code>
    <display>Male</display>
  </gender>
  <birthDate>1974-12-25</birthDate>
```



HTTP/1.1 200 OK

Content-Type:  
application/json;charset=utf-8

Content-Length: 627

Content-Location:  
/fhir/person/@1/history/@1

Last-Modified: Tue, 29 May 2012  
23:45:32 GMT

ETag: "1"

```
"Person":{"id":{"value":"1"},"identifier":[{"type":{"code":"ssn","system":"http://hl7.org/fhir/sid
```



# JSON

# JSON

- First there was FHIR...and one of two “languages” ...that FHIR supports is JSON (the other being restful XML).
- Somebody got clever along the way and decided to call the project to demonstrate FHIR the “Argonaut Project”.

# JSON

- **JSON** (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate. It is based on a subset of the JavaScript Programming Language, Standard ECMA-262 3rd Edition - December 1999.
- *[json.org/JSON](http://json.org/JSON)*

# JSON

- JSON, or JavaScript Object Notation, is an open standard format that uses human-readable text to transmit data objects consisting of attribute–value pairs. Wikipedia

# What's Next?

- **September 2013** Draft Standard for Trial Use Ballot
  - Coverage of C-CDA contents
- **September 2014** Second Draft Standard for Trial Use ballot (DSTU)
  - Semi-stable platform for implementers Additional DSTU versions roughly annually to make fixes, introduce new resources
- **Normative is around 3 years out**
  - We want *\*lots\** of implementation experience before committing to backward compatibility
  - *Active Registry support is being handled and hosted by Ewout Kramer and his employer for now*



# THE ARGONAUT PROJECT

- The project charter for the Argonaut Project can be found on Dr. John Halamka's blog site:
  - <http://geekdoctor.blogspot.com/2014/12/the-argonaut-project-charter.html>

# The Argonaut Project

- Started by a group of private sector stakeholders including athenahealth, Beth Israel Deaconess Medical Center, Cerner, Epic, Intermountain Health, Mayo Clinic, McKesson, MEDITECH, Partners Healthcare System, SMART at Boston Children's Hospital Informatics Program, and The Advisory Board Company met with HL7 and FHIR leadership to accelerate query/response interoperability under the auspices of ANSI-certified HL7 standards development organization processes.

# The Argonaut Project--Purpose

- The purpose of the Argonaut Project is to rapidly develop a first-generation FHIR-based API and Core Data Services specification to enable expanded information sharing for electronic health records and other health information technology based on Internet standards and architectural patterns and styles. This effort follows on recommendations from the HIT Policy Committee's JASON Task Force Report, the HIT Standards Committee's Nationwide Health Information Network (NwHIN) Power Team, the MITRE JASON Reports of 2013 and 2014, and the 2010 PCAST Report.

# The Argonaut Project

- Argonaut wants to create three deliverables:

## 1. FHIR Data Query Profiles.

A set of FHIR Resources and accompanying profiles that enables query/response of the discrete data elements contained in the Meaningful Use Common Data Set. The work will be completed for inclusion in the May 2015 HL7 FHIR Draft Standard for Trial Use revision 2 ballot.

# The Argonaut Project

## 2. FHIR Document Query Profile.

A FHIR resource and profile that enables query/response of IHE X\* metadata resources, and specifically, transition of care and patient summary CCDAs. The work will be completed for inclusion in the May 2015 HL7 FHIR Draft Standard for Trial Use revision 2 ballot.

# The Argonaut Project

## 3. Security Implementation Guide

Security Implementation Guide. Based on the SMART OAuth 2.0 and OpenID Connect profiles, a final guide will be completed the week of Apr 1, 2015. The Security Implementation Guide will eventually be incorporated in the HL7 balloting process, but for this project will be developed in parallel to accompany the FHIR Data Query and Document Query Profiles and Implementation Guides.

# The Argonaut Project

- The Argonaut project is time limited and focused on just those three specific deliverables in 2015. It is not a new organization nor is it competitive with any other effort\*

*\*Taken directly from Dr. Halamka's blog post*

# 2015 Standards Advisory Document

- Published by ONC in late January 2015
- Available as a draft document from ONC at:
  - [www.healthit.gov/standards-advisory](http://www.healthit.gov/standards-advisory)

# HL7 Work Groups

- To Find the work being done inside of HL7 and the individuals and organizations doing the work, start by looking for the list of HL7 Work Groups at:

<http://www.hl7.org/Special/committees/index.cfm?ref=nav>