The Argonaut Project: Accelerating FHIR

slides: bit.ly/smart-fhir-tech

February 2019

What is the Argonaut Project?

The Argonaut Project is an implementation community comprising leading technology vendors and provider organizations to accelerate the use of FHIR and OAuth in health care information exchange.

We are:

- Private sector initiated and funded
- Working collaboratively with other FHIR initiatives such as SMART-on-FHIR, the Health Systems Platform Consortium, and the FHIR Foundation
- Creating open industry Implementation Guides in high priority use cases of importance to patients, providers and the industry as a whole

We are NOT:

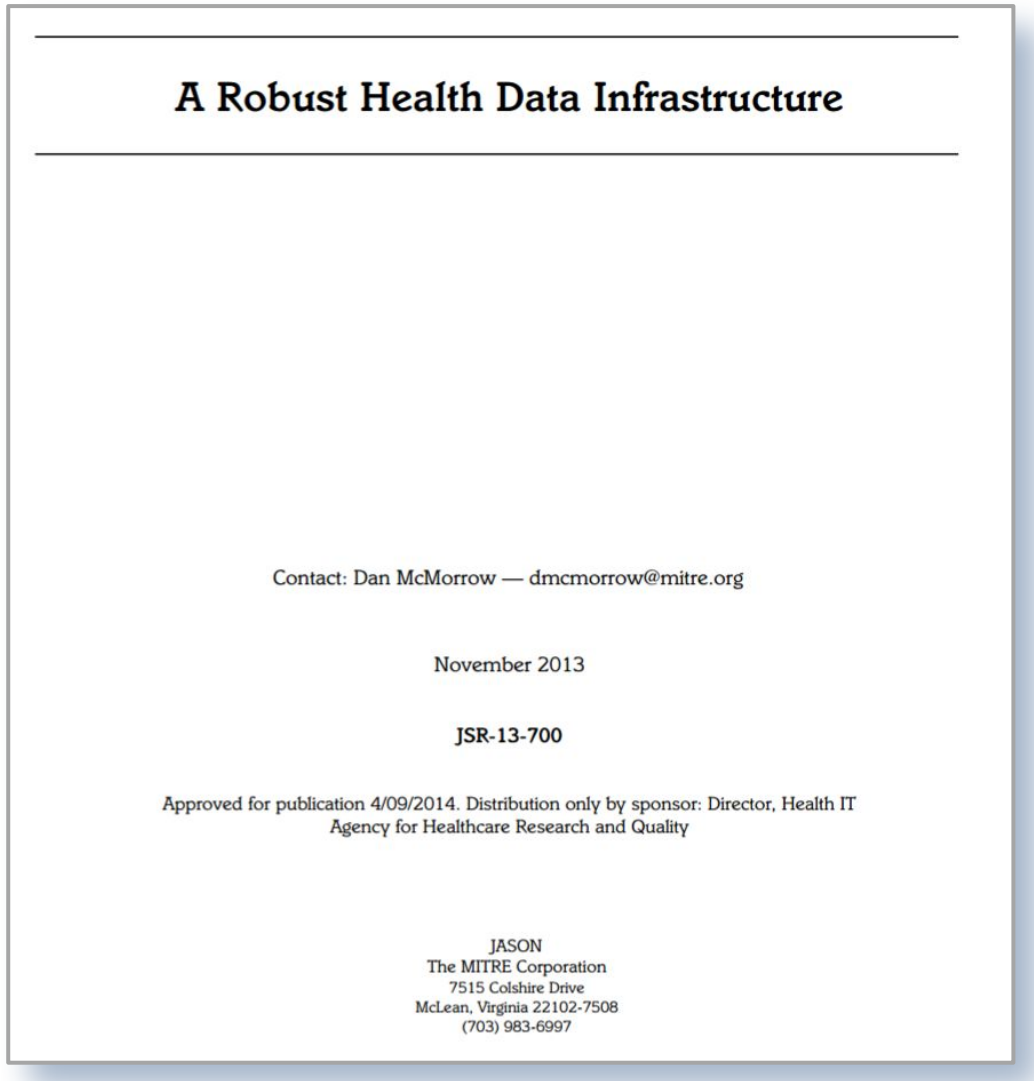
- A standards development activity
- A separate legal entity
- A proprietary activity

Technology Vendors	Provider Organizations
• Accenture	• Beth Israel Deaconess Medical Center
• Apple	• Intermountain Health
• athenahealth	• Mayo Clinic
• Cerner	• Partners Healthcare
• Epic	• SMART at Boston Children's Hospital
• Change Healthcare	
• MEDITECH	
• Microsoft	
• Surescripts	
• The Advisory Board Company/Optum	

Staff (current and past)

- Prime contractor: HL7
- FHIR initiatives: Grahame Grieve, Josh Mandel, Brett Marquard, Eric Haas
- OAuth initiatives: Dixie Baker, Josh Mandel
- Project Management: Micky Tripathi, Jennifer Monahan

It all started with JASON Report



A Robust Health Data Infrastructure

Contact: Dan McMorrow — dmcmorrow@mitre.org

November 2013

JSR-13-700

Approved for publication 4/09/2014. Distribution only by sponsor: Director, Health IT
Agency for Healthcare Research and Quality

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- **Highly critical of the status and trajectory of US healthcare interoperability**
  - Blamed EHR vendor technology and business practices and lack of an architecture supporting standardized APIs
- **Recommended a "unifying software architecture" to migrate data from legacy systems to a new centrally orchestrated architecture**
  - ONC should define "an overarching software architecture for the health data infrastructure" within 12 months

JASON Task Force Recommendations (2014)

Member Name	Organization
David McCallie (Co-Chair)	Cerner
Micky Tripathi (Co-Chair)	MAeHC
Deven McGraw	Manatt
Gayle Harrell	Florida State Legislator
Larry Wolf	Kindred Healthcare
Troy Seagondollar	Kaiser
Andy Wiesenthal	Deloitte
Arien Malec	RelayHealth
Keith Figlioli	Premier, Inc.
Wes Rishel	
Larry Garber	Reliant Medical Group
Josh Mandel	Boston Children's Hospital
Landen Bain	CDISC
Nancy J. Orvis	FHA/DoD
Tracy Meyer	FHA/ONC
Jon White	HHS

1. **Foundation of interoperability should be an orchestrated architecture employing Public APIs based on FHIR**

2. **Current interoperability approaches need to be gradually replaced with more comprehensive API-based models**

3. **FHIR is the best candidate for such API-based models**

4. **Meaningful Use Stage 3 & 2015 Edition EHR certification should be used as a pivot point to initiate this transition**

What's so great about FHIR?

Flexible to document-level and data-level exchange

- Sometimes individual data elements are important, sometimes entire documents are appropriate

Based on modern internet conventions

- RESTful API – same browser-based approach as used by Facebook, google, twitter, etc
- Infinitely extensible to detailed resources/profiles to meet any use case
- Supports push and pull use cases

Attractive to developers from outside of healthcare

- Brings new voices into health care and pushes the industry to innovate at internet speed

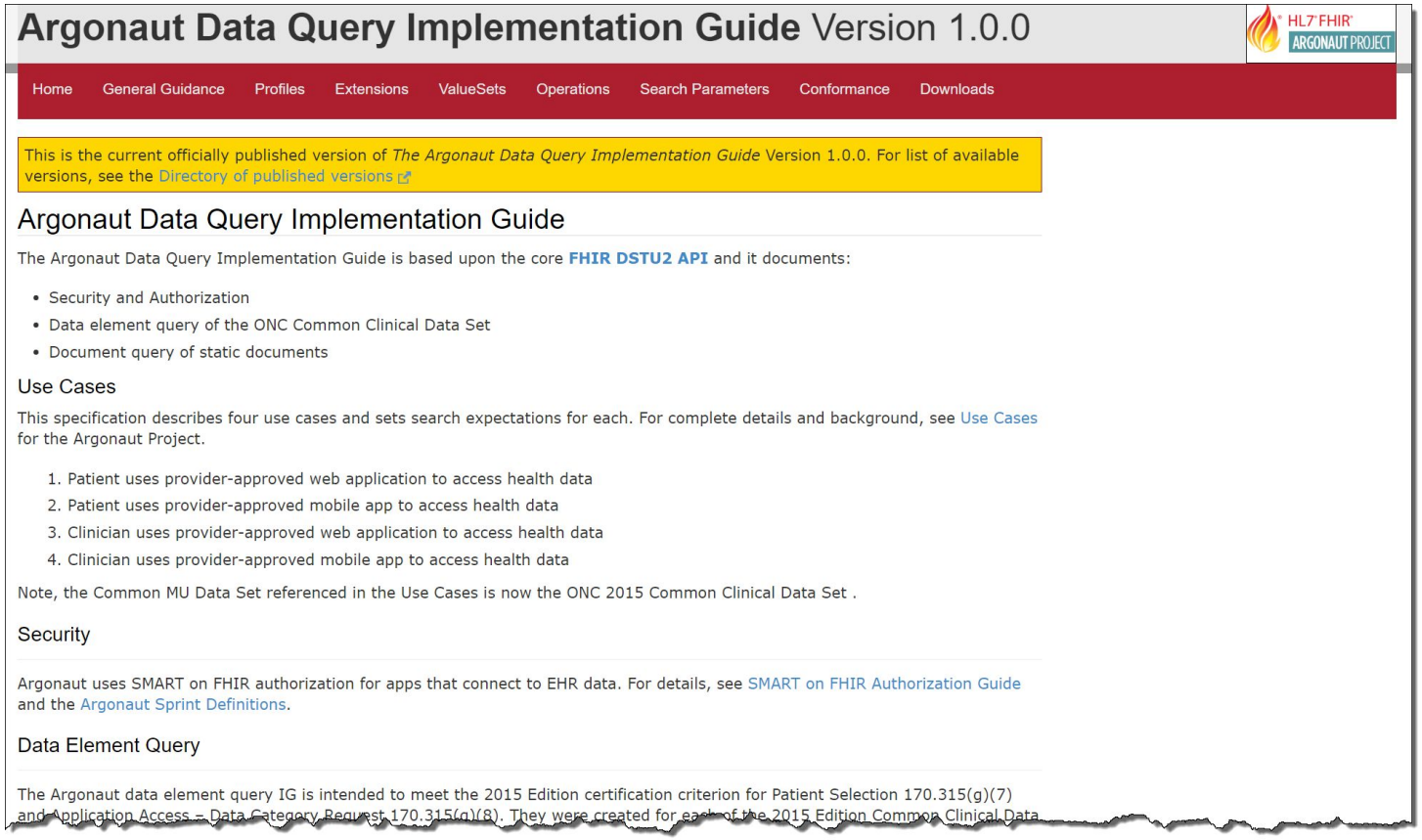
Why do we need the Argonaut Project to accelerate FHIR?

Comprehensiveness ↔ Speed-to-market

Relevance and Usability requires market input

Early collaboration to head off balkanization

A Signature Event: Argonaut Data Query Implementation Guide



Argonaut Data Query Implementation Guide Version 1.0.0

HL7 FHIR ARGONAUT PROJECT

Home | General Guidance | Profiles | Extensions | ValueSets | Operations | Search Parameters | Conformance | Downloads

This is the current officially published version of *The Argonaut Data Query Implementation Guide* Version 1.0.0. For list of available versions, see the Directory of published versions

Argonaut Data Query Implementation Guide

The Argonaut Data Query Implementation Guide is based upon the core **FHIR DSTU2 API** and it documents:

- Security and Authorization
- Data element query of the ONC Common Clinical Data Set
- Document query of static documents

Use Cases

This specification describes four use cases and sets search expectations for each. For complete details and background, see Use Cases for the Argonaut Project.

1. Patient uses provider-approved web application to access health data
2. Patient uses provider-approved mobile app to access health data
3. Clinician uses provider-approved web application to access health data
4. Clinician uses provider-approved mobile app to access health data

Note, the Common MU Data Set referenced in the Use Cases is now the ONC 2015 Common Clinical Data Set .

Security

Argonaut uses SMART on FHIR authorization for apps that connect to EHR data. For details, see SMART on FHIR Authorization Guide and the Argonaut Sprint Definitions.

Data Element Query

The Argonaut data element query IG is intended to meet the 2015 Edition certification criterion for Patient Selection 170.315(g)(7) and Application Access – Data Category Request 170.315(g)(8). They were created for each of the 2015 Edition Common Clinical Data

http://www.fhir.org/guides/argonaut/r2/

- Access to individual data elements of *Common Clinical Data Set*
- Access to structured document (CCD) containing all *Common Clinical Data Set* elements
- Leverage OAuth2-based security and authorization

What does the Argonaut process do? Set priorities

2015 Edition Common Clinical Data Set

Patient name
Sex
Date of birth
Race
Ethnicity
Preferred language
Smoking status
Problems
Medications
Medication allergies
Laboratory tests
Laboratory results
Vital signs
Procedures
Care team members
Immunizations
Unique Device identifiers
Assessment and Plan of Treatment
Goals
Health concerns

93 FHIR DSTU2 Resources (17 Argonaut CCDS Resources in red)

Clinical	Identification	Workflow	Infrastructure	Conformance	Financial
AllergyIntolerance	Patient	Encounter	Questionnaire	ValueSet	Coverage
Condition (Problem)	Practitioner	EpisodeOfCare	QuestionnaireRespons	ConceptMap	EligibilityRequest
Procedure	RelatedPerson	Communication	Provenance	NamingSystem	EligibilityResponse
ClinicalImpression	Organization	Flag	AuditEvent	StructureDefinition	EnrollmentRequest
FamilyMemberHistory	HealthcareService	Appointment	Composition	DataElement	EnrollmentResponse
RiskAssessment	Group	AppointmentResponse	DocumentManifest	Conformance	Claim
DetectedIssue	Location	Schedule	DocumentReference	OperationDefinition	ClaimResponse
CarePlan	Substance	Slot	List	SearchParameter	PaymentNotice
Goal	Person	Order	Media	ImplementationGuide	PaymentReconciliation
ReferralRequest	Contract	OrderResponse	Binary	TestScript	ExplanationOfBenefit
ProcedureRequest	Device	CommunicationRequest	Bundle		
NutritionOrder	DeviceComponent	DeviceUseRequest	Basic		
VisionPrescription	DeviceMetric	DeviceUseStatement	MessageHeader		
Medication		ProcessRequest	OperationOutcome		
MedicationOrder		ProcessResponse	Parameters		
MedicationAdministration		SupplyRequest	Subscription		
MedicationDispense		SupplyDelivery			
MedicationStatement					
Immunization					
ImmunizationRecommendation					
Observation					
DiagnosticReport					
DiagnosticOrder					
Specimen					
BodySite					
ImagingStudy					
ImagingObjectSelection					

What does the Argonaut process do? Resolve practical problems

What search criteria can you use?

Search operations

Examples:

- Can search for individual patient by identifier (e.g., MRN) OR full name & gender OR full name & birthdate
- Can search for Procedures by patient or by patient & specified date range

What type of data will you get in response?

Scope of response

Examples:

- Search for patient will get all FHIR patient resources
- Search for Procedures will get all current and historical procedures or within specified date range

How will that data be represented?

Content of response

Examples:

- Patient search will get name, identifier, gender, birthdate, birth sex, REL
- Procedures search will get type of procedure, date performed, and procedure status
- In some cases created Argonaut extensions and value sets

Argonaut Project 2017 Projects

1. Scheduling Implementation Guide (Published March 2018)

- Appointments request – request for appointment
- Appointment response – reply to an appointment request
- Slots – blocks of time available for booking appointments
- http://www.fhir.org/guides/argonaut/scheduling/index.html

2. CDS Hooks: Enhancing integration of EHRs and Apps (HL7 Ballot in May 2018)

- Integration of an external app or service into an EHR workflow
- Validation of security model for integration of external apps/services with EHRs
- http://cds-hooks.org/specification/1.0/

Argonaut Project 2018 Projects

1. Clinical Notes

- Shouldn't there be a Common Clinical Note Set to accompany the Common Clinical Data Set?
- Plan to publish IG in February 2019
- https://argonautproject.github.io/clinicalnotes/

2. Bulk Data Access to Clinical Data

- A roster of patients rather than one patient at a time
- External security review completed and changes incorporated, plan to complete and publish IG February 2019
- https://github.com/smart-on-fhir/fhir-bulk-data-docs/pulls?q=is%3Apr+is%3Aclosed

3. Simple Assessment Questionnaires

- Import from external experts and capture/export data consistently
- Implement custom assessments across disparate systems and aggregate responses
- Plan to publish IG in February 2019
- CI Build IG: https://argonautproject.github.io/questionnaire/adaptive.html

Argonaut Project 2019 Projects

1. **Update Argonaut Data Query IG**
   - Update STU2 to US Core R4 resources
   - Test R4 resources
   - Add Encounters and Clinical Notes
   - Consider adding write capability for subset of resources

2. **Clinical Data Subscriptions**
   - Enables push use cases

3. **Provenance**
   - Anticipated to be part of USCDI
     (i.e., the who, what, when, where, why, and how → author, timestamp, org)

4. **SMART web messaging + CDS Hooks (radiology ordering)**
   - Supports 2020 PAMA requirement

Argonaut Project Timeline

Oct 2014

JASON Task Force Recommendations

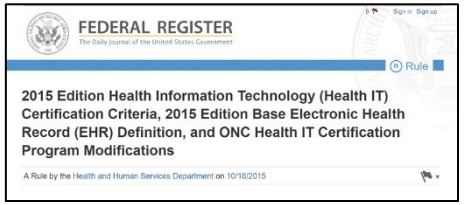
Call to action for APIs and FHIR

Dec 2014

HL7® FHIR® ARGONAUT PROJECT

Launch of Argonaut Project

Oct 2015

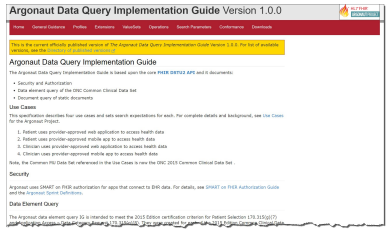


EHR certification includes API requirement

Dec 2016

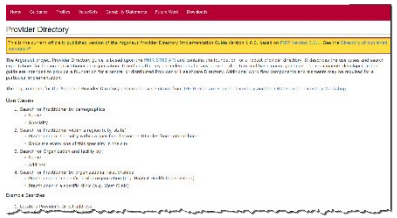
SMART

S&I Initiative Data Access Framework



Data Query Implementation Guide published

Jun 2017



Provider Directory Implementation Guide published

Mar-May 2018

Scheduling Implementation Guide

CDS Hooks Implementation Guide

Four Short Years from Inception to Market Adoption

Jan 2018 — **Feb 2018**

carequality

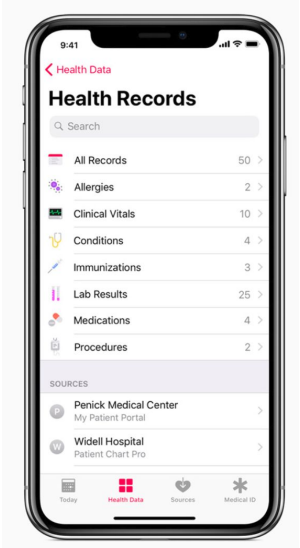
Carequality implements Argonaut Provider Directory specifications

commonwell HEALTH ALLIANCE

CommonWell includes Argonaut FHIR specifications in core services – MEDITECH goes live on FHIR

ONC Certified HIT 2015 EDITION

50% of 100+ certified vendors use FHIR APIs



Apple includes Argonaut FHIR specifications in iPhone

www.argonautproject.org

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