HL7 FHIR DevDays 2018

HL7® FHIR®

General Introduction to FHIR

Richard Ettema, AEGIS.net, Inc.

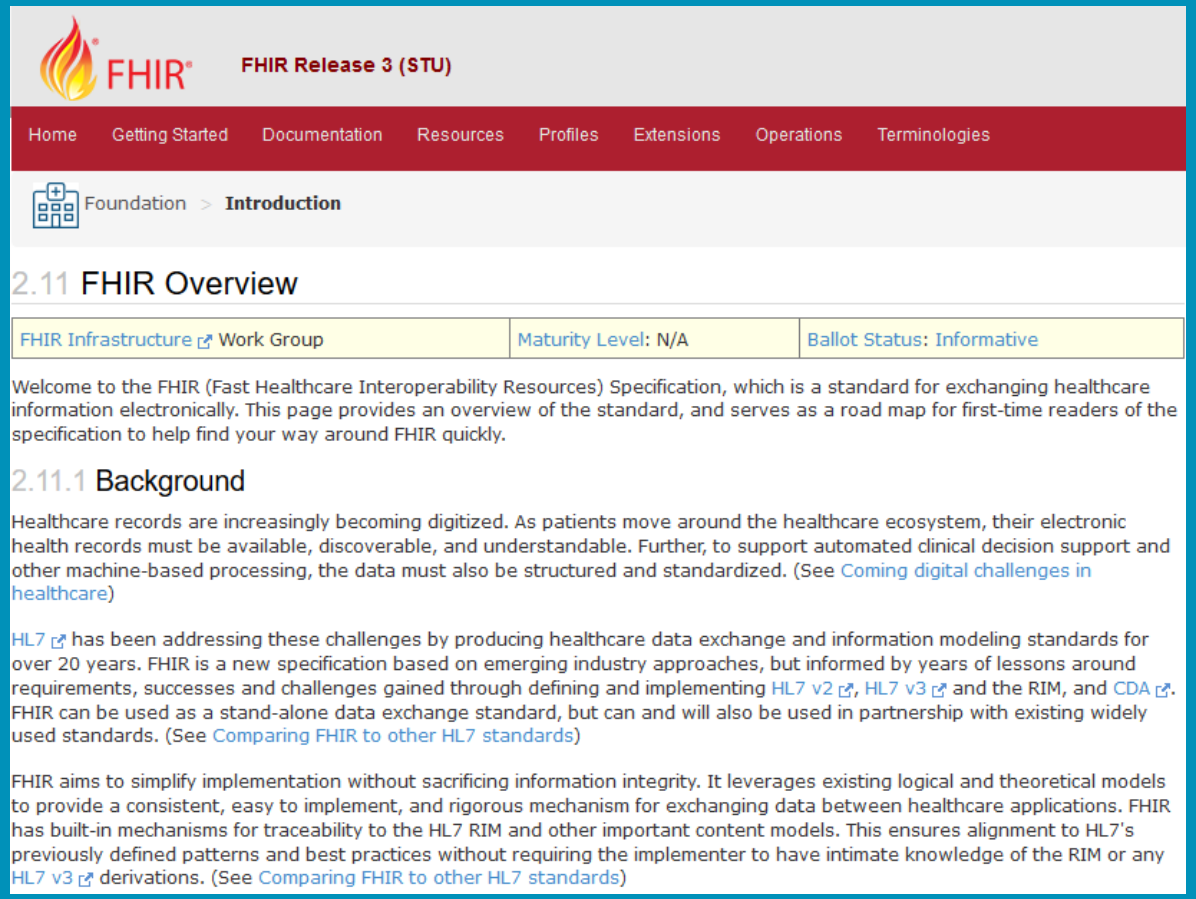
Boston, 19-21 June | @HL7 @FirelyTeam | #fhirdevdays18 | www.fhirdevdays.com

Presented by

- **Name:** Richard Ettema
- **Position:**
  - Lead Consultant, AEGIS.net, Inc.
  - FHIR® Certified Implementer
- **Background:**
  - 34+ years IT industry experience
  - 14+ years leading HIT development/implementation efforts
  - 4+ years contributing to the HL7® FHIR® specification (focus on testing)
  - Sr. Architect / Lead Developer for the Touchstone Project
  - Author of the AEGIS WildFHIR public test server and client

What is FHIR?

- The latest HL7 standard for exchanging electronic healthcare information
- Defines a simplified approach to implementation w/o sacrificing information integrity
- Defines “Resource” as the basic building block of all exchangeable content

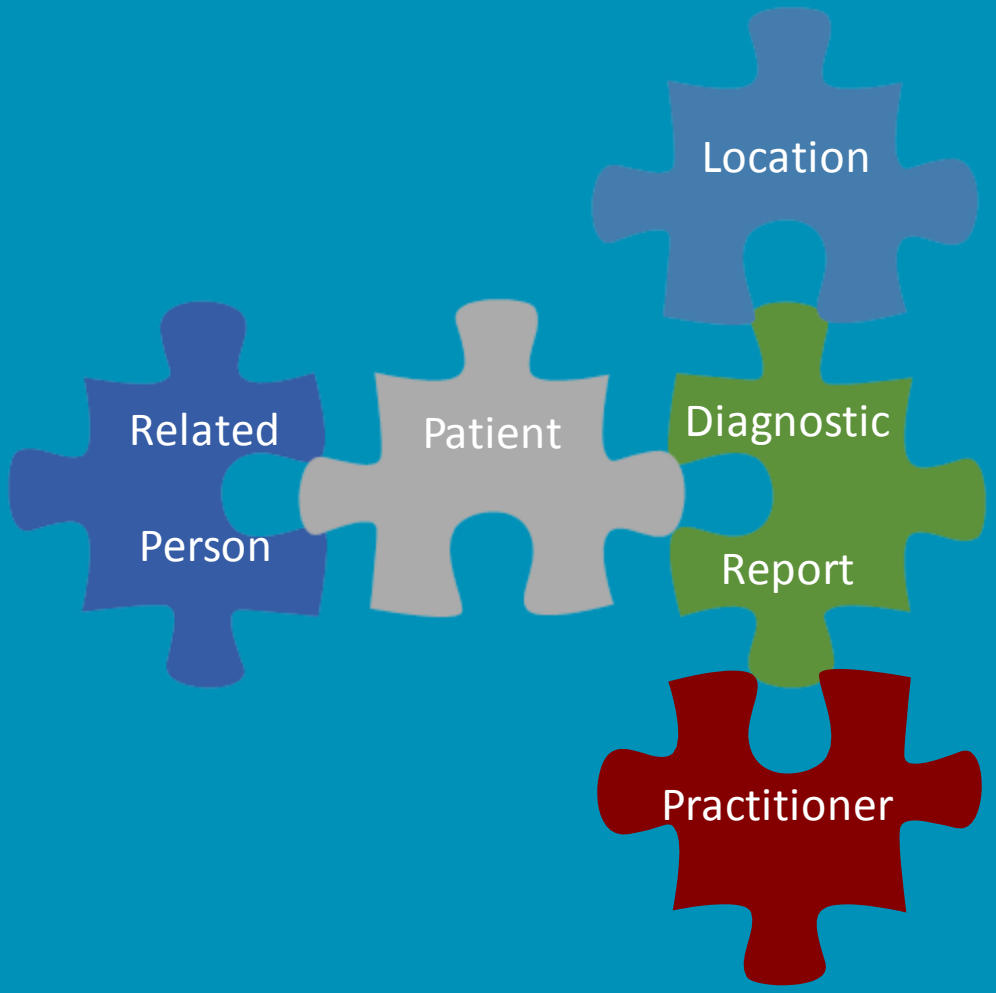


The Acronym

- F – Fast (to design and to implement)
  - Relative – No technology can make implementation as fast we like
- H – Healthcare
  - That's why we're here
- I – Interoperable
  - Ditto
- R – Resources
  - Building blocks (our next focus)

It's all about the Resources…

- Building blocks…



Resources

- The Defined Structured Data Elements that
  - Are the logical, *common* contents of a resource
  - Are mapped to formal definitions; i.e. the RIM (Reference Information Model)
  - Can be represented in multiple syntaxes: JSON, XML, Turtle (Terse RDF Triple)
- Native Support for Extensions
  - Local, Regional, Country specific data requirements, but everyone can use
  - Published and Managed as part of the specification
- May include Human-Readable Narrative
  - XHTML

```
{
  "resourceType": "Patient",
  "id": "example",
  "meta": {
    "versionId": "1",
    "lastUpdated": "2017-01-03T16:05:00.792Z"
  },
  "text": {
    "status": "generated",
    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p>Henry Levin the
7th</p></div>"
  },
  "extension": [
    {
      "url": "http://hl7.org/fhir/StructureDefinition/us-core-birthsex",
      "valueCode": "M"
    }
  ],
  "identifier": [
    {
      "use": "usual",
      "system": "urn:oid:1.2.36.146.595.217.0.1",
      "value": "12345"
    }
  ],
  "active": true,
  "name": [
    {
      "use": "official",
      "family": "Levin",
      "given": [ "Henry" ],
      "suffix": [ "the 7th" ]
    }
  ],
  "gender": "male",
  "birthDate": "1974-12-25",
  "managingOrganization": {
    "reference": "Organization/example"
  }
}
```


FHIR id & metadata

Human Readable Summary

Extension with reference to its definition

Standard Data Content:

- Patient Identity
- Name
- Gender
- Date of Birth
- Provider

What is a Resource?

FHIR Resource Types

- Administrative
  - Patient, Practitioner, Organization, Location, Group
- Clinical Concepts
  - AllergyIntolerance, Condition, Encounter, FamilyHistory
- Infrastructure/Conformance
  - ★ CapabilityStatement,
  - ★ StructureDefinition

Non-Resource Types

- Gender
  - Too small
- Electronic Health Record
  - Too big
- Blood Pressure
  - Too specific
- Intervention
  - Too broad

CapabilityStatement

- Documents the capabilities of a FHIR client and server
- A client should examine the CapabilityStatement of a server to determine its supported behavior
- The CapabilityStatement:
  - is a key part of the FHIR conformance framework
  - is a statement of the features, rules and behaviors of a FHIR system
  - may be used for system compatibility testing, code generation, or as the basis for conformance testing
- To declare themselves "FHIR Conformant", a system **MUST** publish a CapabilityStatement: http://hl7.org/fhir/STU3/http.html#capabilities

StructureDefinition

- A resource that describes a structured set of data element definitions and their associated rules of usage
  - how resource elements and/or data types are used or not used
  - resource or data type extensions
  - Value Set references that specify the content of coded elements
- Describes (Profiles) the base content defined in the specification
- Describes (Profiles) how these structures are utilized in implementation guides

FHIR Use Case – Pediatrician Immunization Scenario

- Example: A mother takes her child to Sunset Pediatric Office. The pediatrician needs to determine what vaccination shot(s) are due for the child.
- Question: What FHIR resources will be used to record this visit and forecast the shot(s) that are due?

Answers

Recording the visit

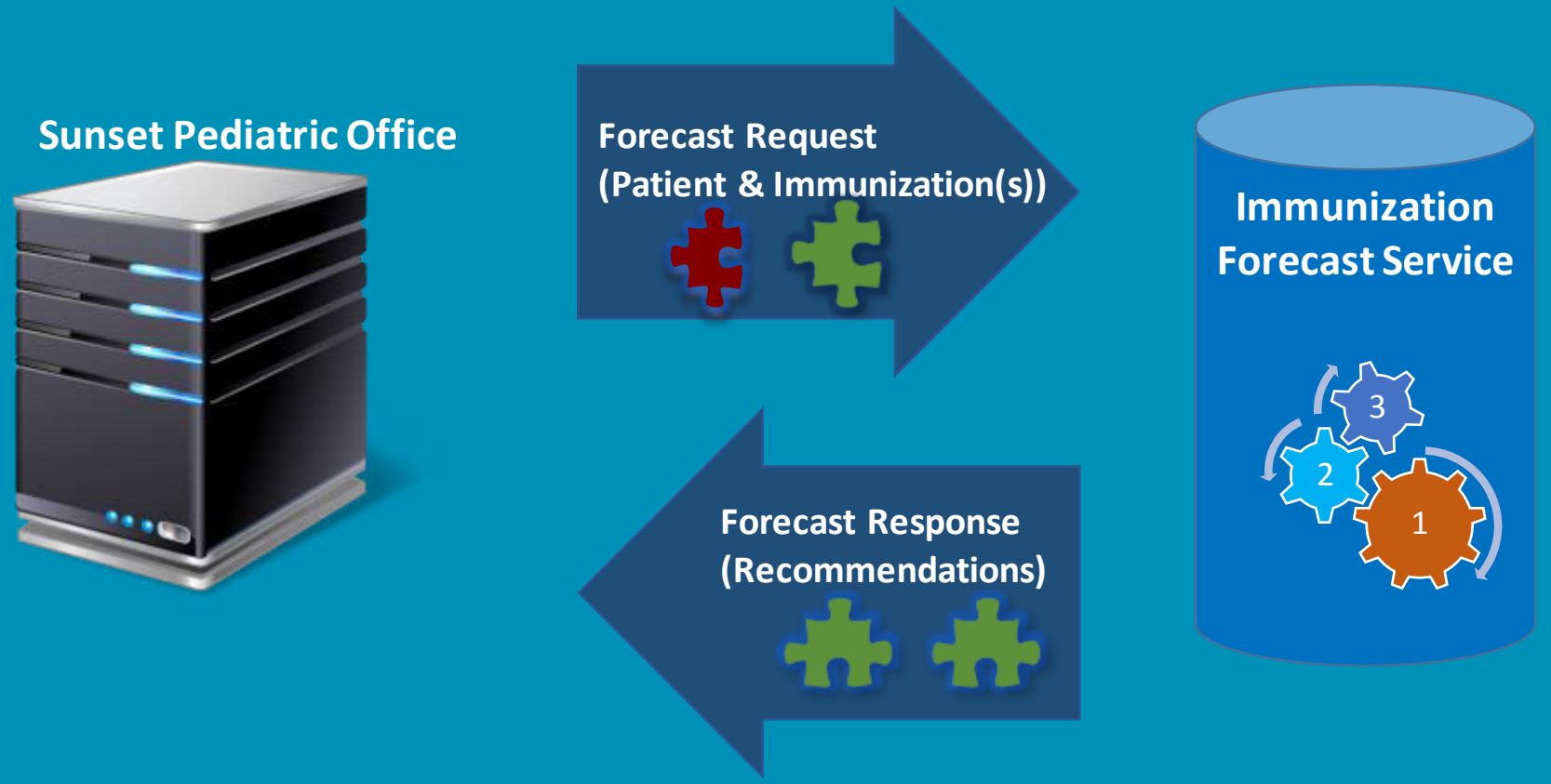
- Patient
- Practitioner
- Organization
- Location
- Observation
- Encounter

Forecasting the shots

- Patient
- Immunization
- ImmunizationRecommendation

★ Let's see how this would work…

Immunization Forecast Workflow



Paradigms

FHIR supports four interoperability paradigms

REST

- Simple, out-of-the-box interoperability
- Leverages HTTP methods: GET, POST, etc.
- Pre-defined operations
  - Create, Read, Update, Delete
  - Also: History, Read Version, Search, Patch, Validate, Capabilities, Batch & Transaction
- Works best where control resides on client side and a trust relationship exists

Patient - Resource Content

http://hl7.org/fhir/patient.html#resource

- The Structure tab shows the element organization
- The Card. stands for cardinality and defines the min and max occurances of an element
- The Type lists the FHIR data type; e.g. name is of type HumanName. Clicking on HumanName will show its structure