

Convegno Annuale AISIS

eHealth 2020

**Semplificare l'integrazione e l'interoperabilità in
Sanità: FHIR®**

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Presidente HL7 Italia

Affiliates Repr. at the HL7 Technical Steering Committee

Cagliari, 13 e 14 ottobre 2016

THotel

Semplificare l'integrazione e l'interoperabilità in Sanità:



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Presidente HL7 Italia

Affiliates Repr. at the HL7 Technical Steering
Committee

Acknowledgments

Ewout Kramer
Lloyd McKenzie
Grahame Grieve
Rik Smithies
René Spronk





PERCHÉ  FHIR[®][©]?

RLUS

CDA

IXS

CCOW

GELLO



“v2”

EHR-S FM

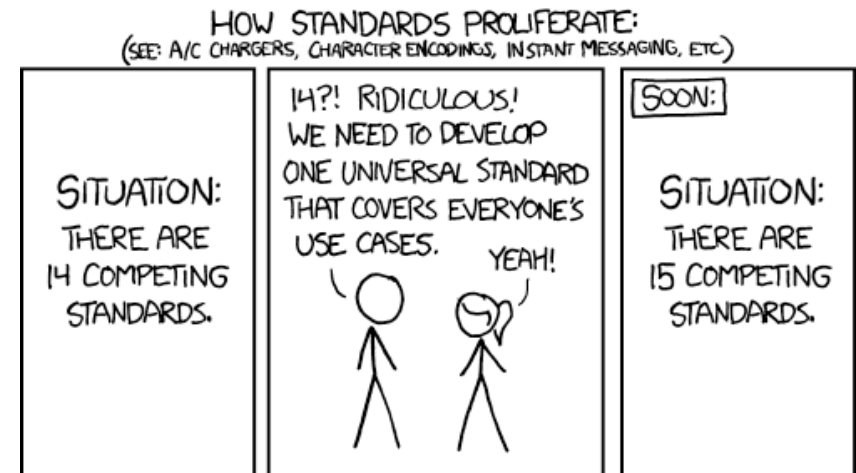
“v3”

PHR-S FM

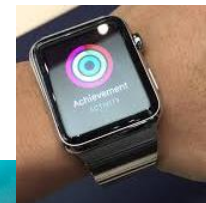
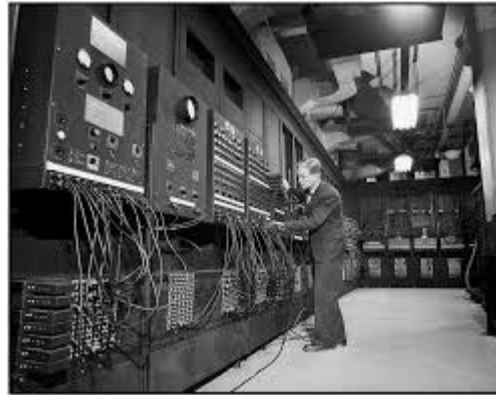
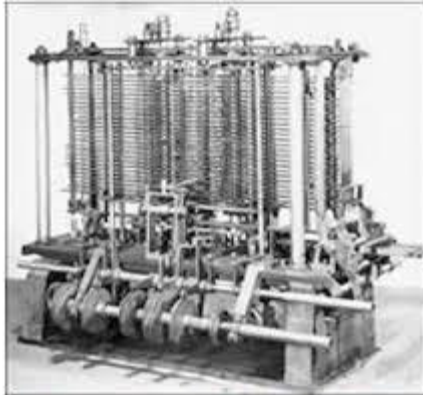
DAM

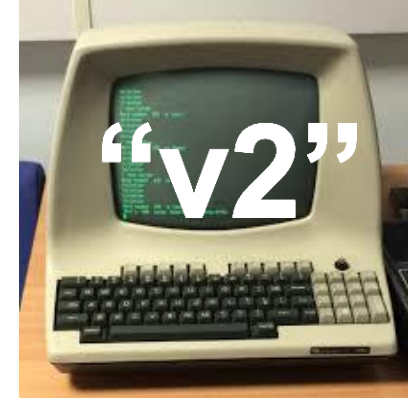
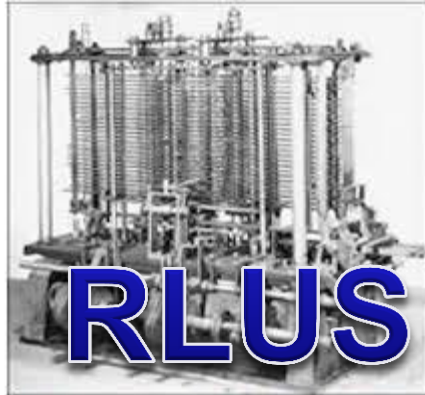
CIMI

C'era bisogno di un altro standard ?

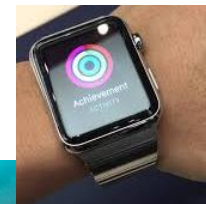


<http://xkcd.com/927/>





“v3”



“THE RISE OF THE API”

REST

Faster, cheaper, smarter

Il tuo “dispositivo” come **Aggregatore** e **Coordinatore** di dati e funzionalità



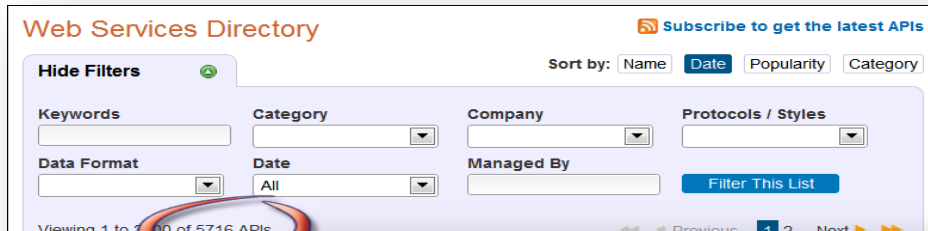
“The API (3rd party) economy”



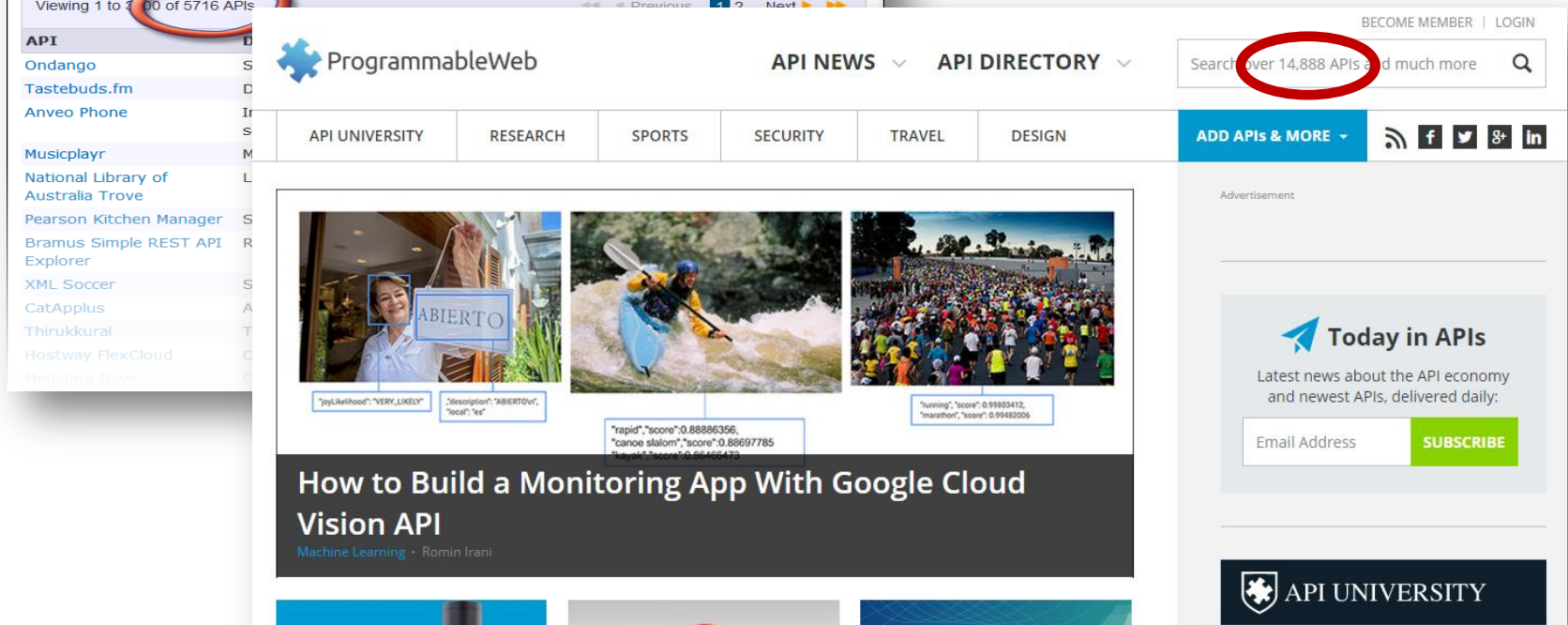
Le aziende espongono i loro assets digitali o servizi in forma di (web) APIs alle terze parti con l'obiettivo di creare valore aggiunto con nuove opportunità di business

La crescita delle API

2012



2016



HL7 & FHIR®

- FHIR è la risposta di HL7 al mondo delle API.
- Ma a dispetto di Twitter, Facebook ecc HL7 non ha "servizi" o "funzionalità" da offrire..
- FHIR è solo un insieme di modelli standardizzati **flessibili** e best-practice che **altri** possono utilizzare per creare API per la sanità od il sociale
- Sviluppatori di terze parti (APP / software) possono connettersi (se autorizzati) alle vostre API FHIR in maniera semplice.

REST: piccole transazioni, con scambi fra sistemi con debole accoppiamento.

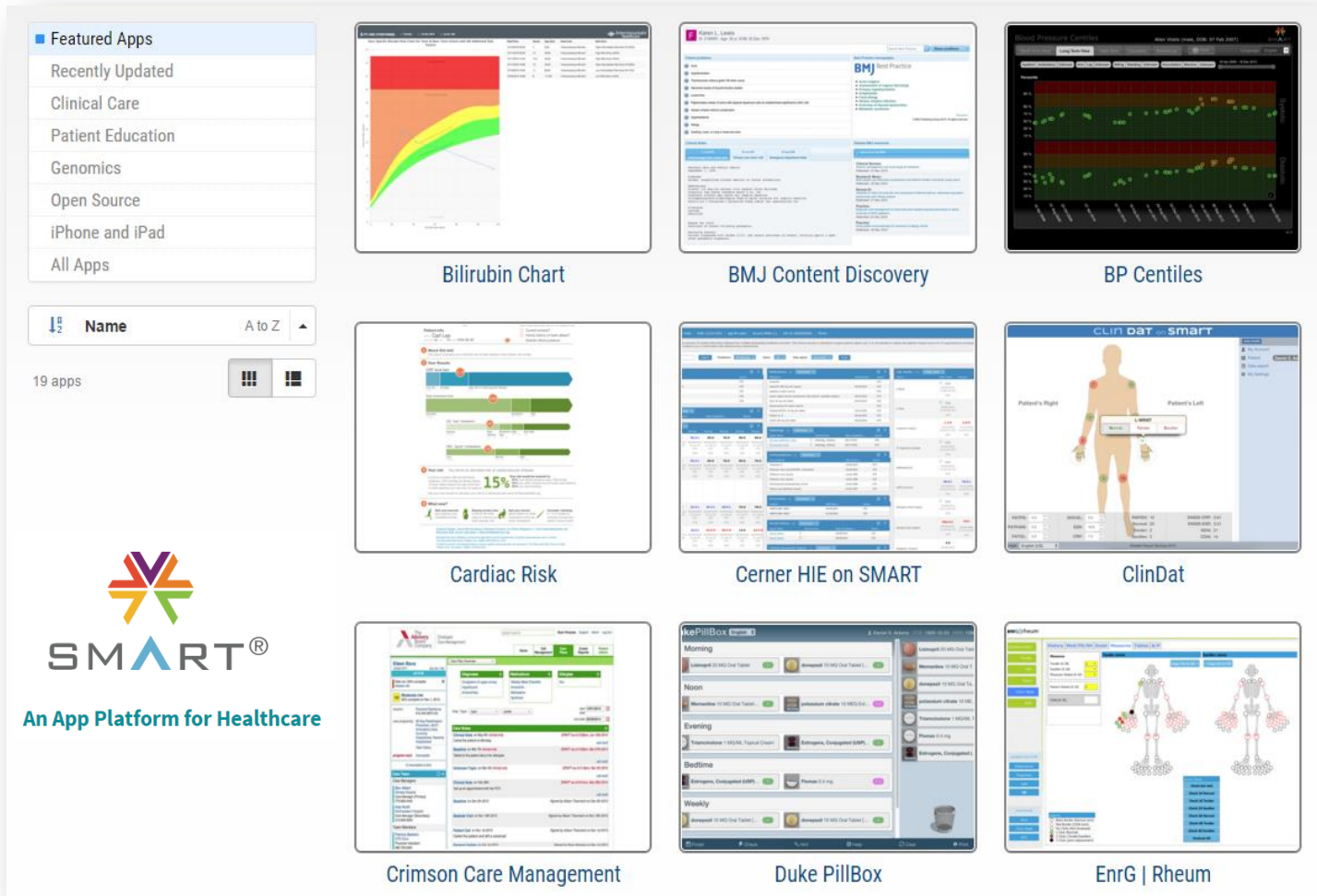
Documenti: Focus sulla persistenza I dati coprono varie risorse



Messaggi Comunicazione di più risorse in un singolo scambio. Forte accoppiamento fra sistemi.

Servizi: Focus sulla capacità di produrre gli effetti voluti in base ai requisiti di business.

App marketplace...



The screenshot displays the SMART App Marketplace interface. On the left, a sidebar lists 'Featured Apps' with categories: Recently Updated, Clinical Care, Patient Education, Genomics, Open Source, iPhone and iPad, and All Apps. Below this is a search bar with 'Name' and 'A to Z' filters, and a button indicating '19 apps'. The main area shows a grid of app thumbnails, each with a title and a preview image:

- Bilirubin Chart**: A line graph showing bilirubin levels over time.
- BMJ Content Discovery**: A list of medical content with filters and search options.
- BP Centiles**: A line graph showing blood pressure centiles over time.
- Cardiac Risk**: A horizontal bar chart showing risk factors and a 15% reduction indicator.
- Cerner HIE on SMART**: A complex dashboard with multiple data panels and filters.
- ClinDat**: A human figure diagram with data points for 'Patient's Right' and 'Patient's Left'.
- Crimson Care Management**: A detailed patient management interface with various data fields and buttons.
- Duke PillBox**: A medication management interface showing dosages and timing for different times of day (Morning, Noon, Evening, Bedtime, Weekly).
- EnrG | Rheum**: A human figure diagram with data points for 'EnrG' and 'Rheum'.

At the bottom left, the SMART logo is displayed with the text 'An App Platform for Healthcare'.

NO: Region Helse-Vest

Timeavtaler

Her ser du fremtidige timeavtaler ved sykehus i Helse Vest og hos fastleger som tilbyr digitale tjenester.

Neste avtale

28. jan 2016, kl. 09:00
Antatt varighet: 1 time

Tildelt

Februar 2016 – mars 2017

24. feb 2016, kl. 11:00

Tildelt

15. apr 2016, kl. 13:00

Tildelt

28. jan 2016, kl. 09:00
Antatt varighet: 1 time

Status: Tildelt

Poliklinisk time, Hudavdelingen
Oppmøtested: Se innkallingsbrev
Ansvarlig behandler: Jon Gottfred Andersen
Avtale med: Haukeland universitetssjukehus, Bergen

Administrer timen
Hvis du ikke kan komme, må du kontakte sykehuset.

Timen bekreftet Legg i egen kalender Endre

Forberedelser til timen
Hvis mer informasjon er tilgjengelig, vises den her. Har du spørsmål til timen, kan du spørre legen din.
Det er ingen gjeldende dokumenter knyttet til timen.

Henvvisning knyttet til timen

Meldinger til timen (63)

Endre tidspunkt for timeavtale: 9. feb. 2016, kl. 08.00

Til
Avdeling for radiologi ved Helseforetaksnavnesen

Når vil du ha time? *

Velg tidspunkt fra kalender Foreslå tidspunkt selv

< Februar 2016 >

< Uke 7 >

08	09	10	11	12	13	14
Mandag	Tirsdag	Onsdag	Torsdag	Fredag	Lørdag	Søndag
	08:00 - 08:15	10:30 - 10:40	Ingen ledige timer	09:30 - 09:45	Ingen ledige timer	Ingen ledige timer
	11:00 - 11:15	11:00 - 11:10		09:45 - 10:00		
	14:30 - 14:45	14:00 - 14:10		13:00 - 13:45		
	15:00 - 15:15	15:20 - 15:30		15:30 - 15:45		

ENDRE Avbryt

MITT TIMEVALG

••••• NÅR ALLE MØTER, BLIR VENTETIDA KORTARE

EHR Vendors...



AllergyIntolerance

[explore the spec →](#)

The AllergyIntolerance data models describe a patient's intolerance to a foreign substance and an associated reaction that occurs from exposure.

Medication + MedicationOrder

[explore the spec →](#)

The Medication and MedicationOrder data models combine to model a patient's prescribed medication orders and administration instructions.

Condition

[explore the spec →](#)

Conditions can encompass acute and chronic problems and conditions, as well as encounter diagnoses.

Observation - Vital Signs

[explore the spec →](#)

This implementation of the Observation resource is limited to the querying for and display of vital signs.

Appointment

[explore the spec →](#)

This basic FHIR write service allows a client to schedule an appointment into a slot. We currently only provide prototype support for this resource in our sandbox, to better understand how clients might want to use it in production.

START CODING

ies (SMART)

the best of breed
once an app is created
developers will be able
to bring clinicians to

Nuovi prodotti ogni giorno

HealthData
Management

All Sections ▾



Hackensack University follows FHIR-enabled route to data exchange

Innovations with emerging standards are helping the facility share medical alerts and information across disparate IT systems and devices, says Shafiq Rab, MD, its CIO.

FHIR
Maggie Van Dyke February 17



SMART on FHIR gets a testing ground for data exchange

Developers can share apps that can enable exchanges between EHRs, says Cerner's Bob Robke.

FHIR
Greg Slabodkin February 12

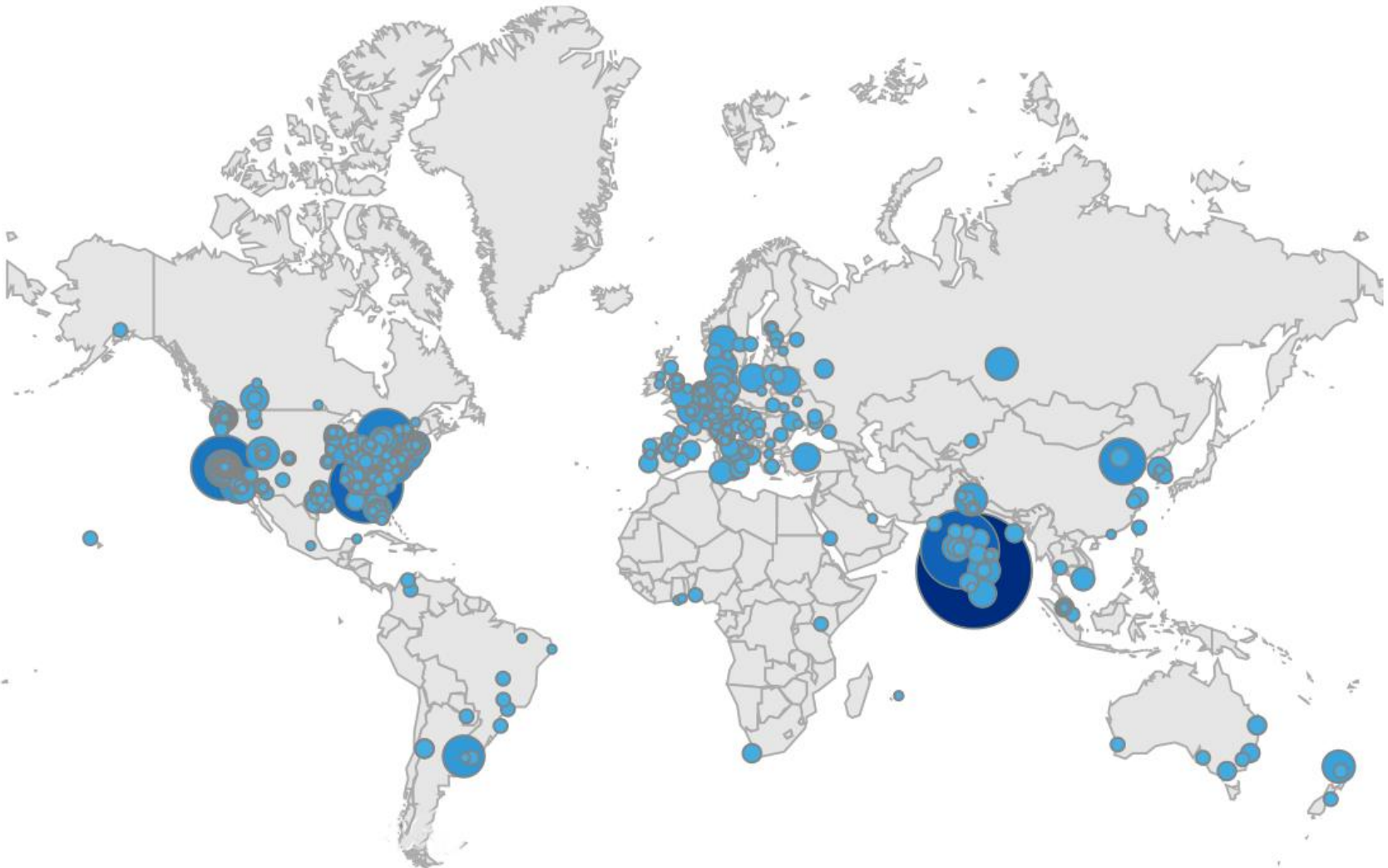


Healthcare connectivity set to take off with value-based care

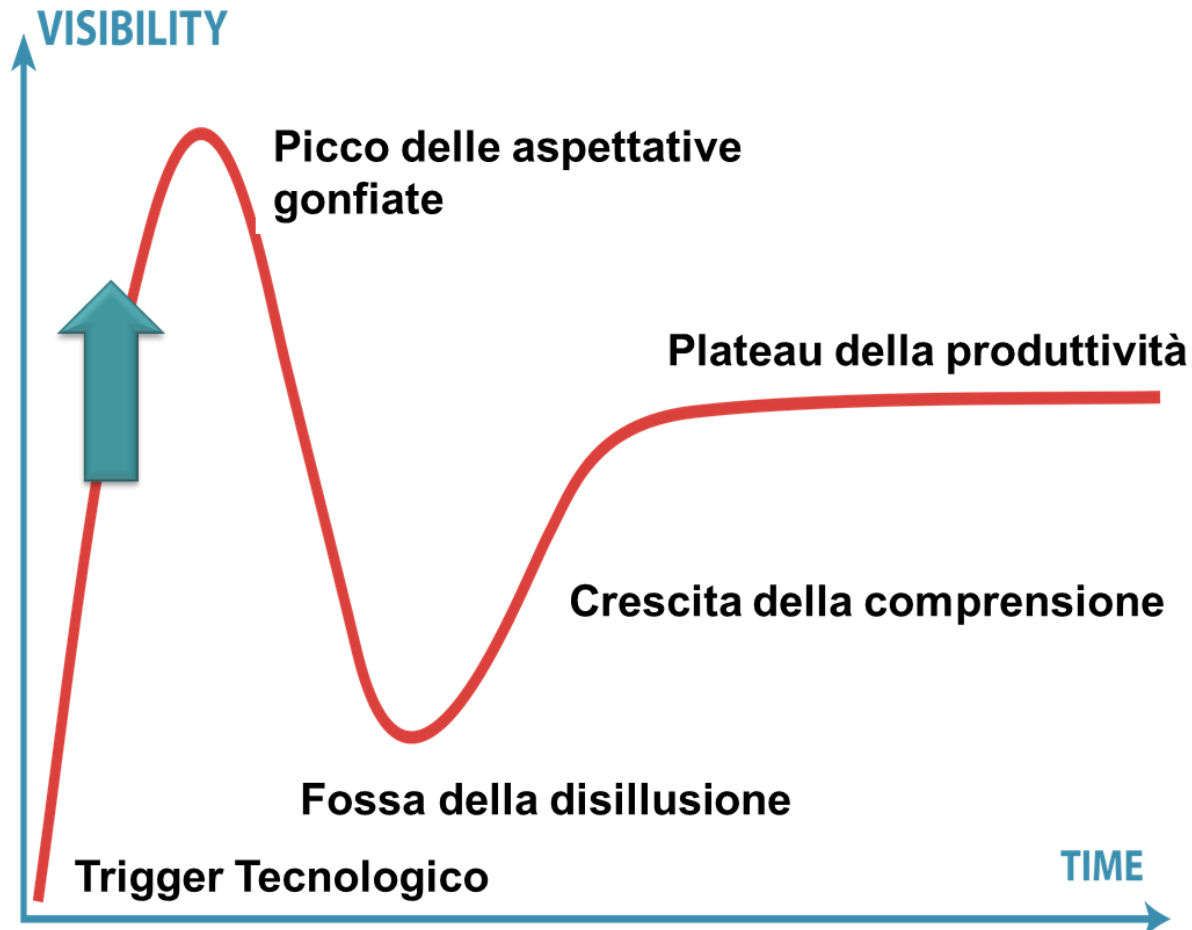
Progress being made on several fronts, including secure messaging, e-prescribing and the exchange of continuity-of-care documents, but leaders such as Micki Tripathi of the Massachusetts E-Health Collaborative say there's still work to be done.

Interoperability
Elizabeth Gardner February 2

2015 HAPI FHIR Test Server statistics



Gartner hype cycle



COS'E' FHIR[®][©] ?

Fast

Relativo – Nessuna tecnologia può rendere l'integrazione così veloce come vorremmo...

Healthcare

..Il nostro dominio...

Interoperability

..la ragione per cui usiamo gli standard...

Resources

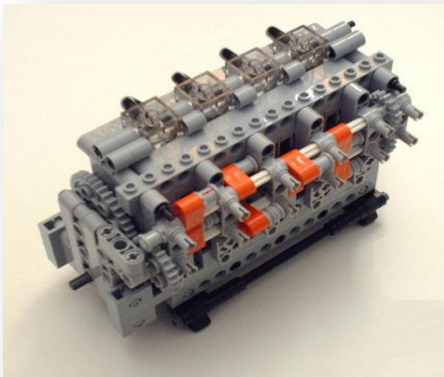
I mattoni (building block) – *più dettagli in seguito*



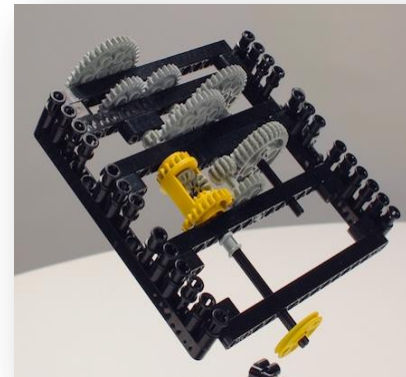
Focus sugli **implementatori**
Mantenere semplici **gli scenari comuni**
Far leva sulle **tecnologie esistenti**
Rendere i contenuti **disponibili**
gratuitamente
Coinvolgere la **community**

Le ‘Risorse’ FHIR

Scomporre i dati (sociali e sanitari) in “mattoni” discreti



MedicationOrder



Condition

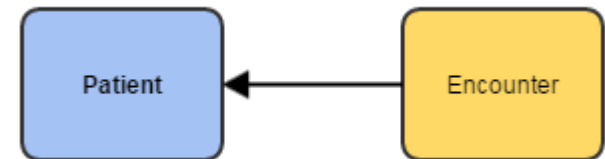
- Copre l’ “80%”
- Unità di scambio
- Mantenute e documentate indipendentemente
- Hanno una descrizione testuale

RESTful FHIR Esempi

GET <http://myfhirserver.com/patient/123>



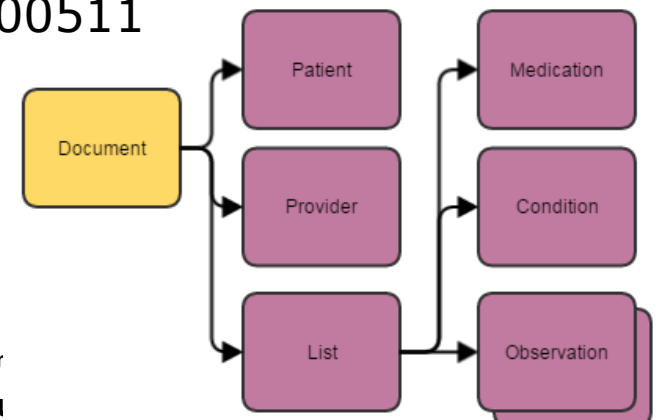
GET http://myfhirserver.com/encounter/904?_include=patient



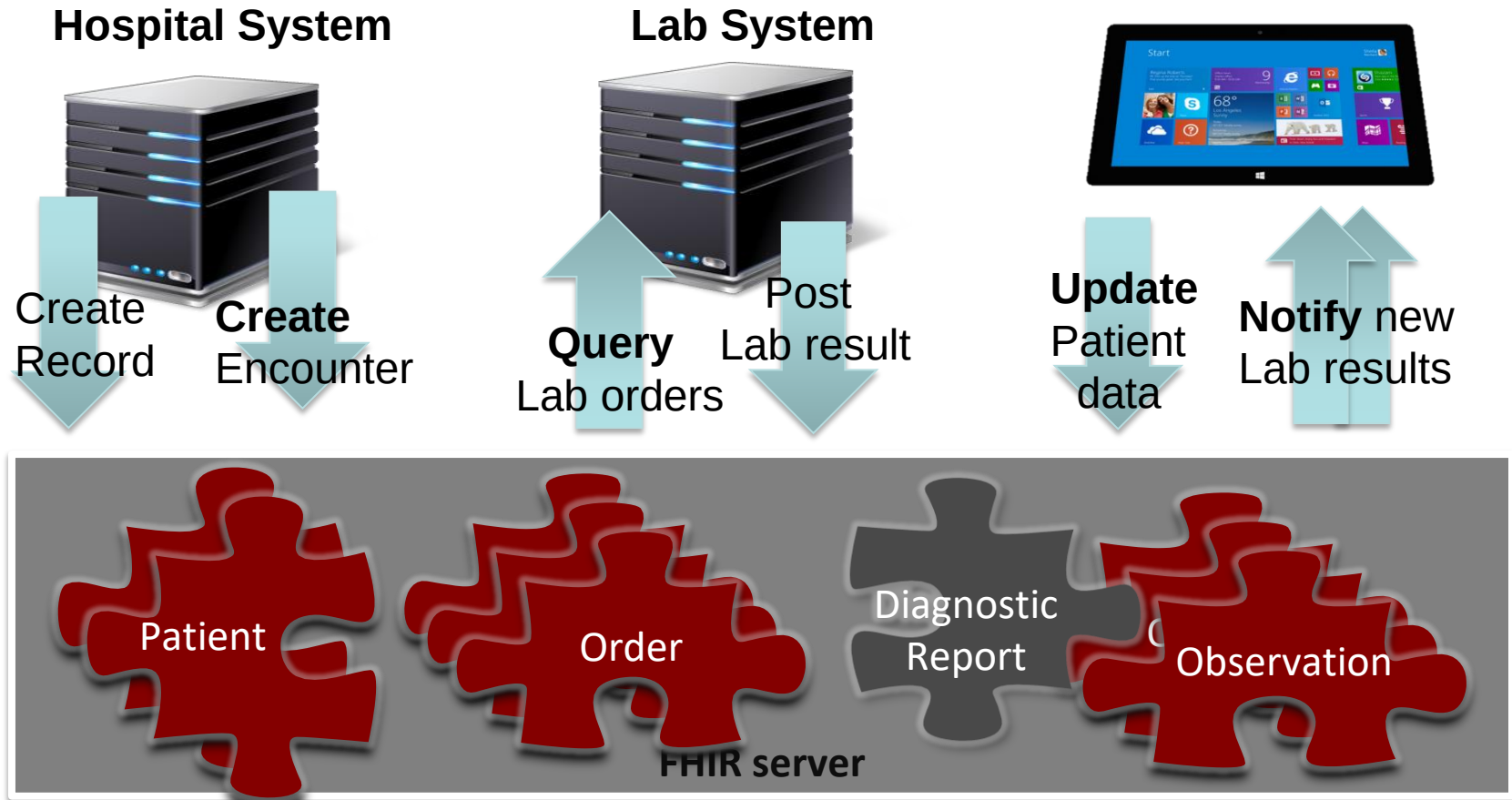
PUT <http://myfhirserver.com/encounter/707> {XML or JSON Resource expression}



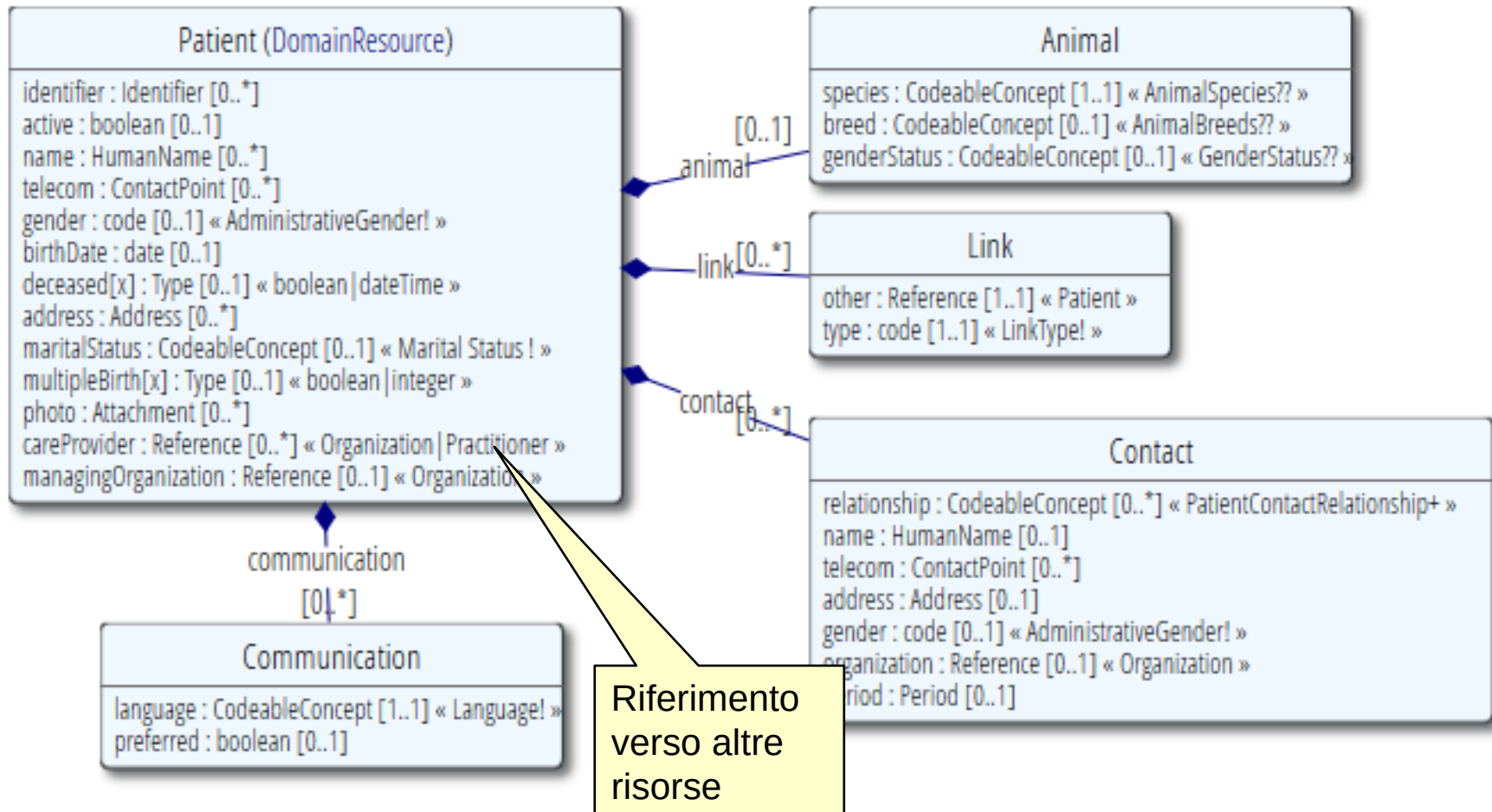
GET <http://myfhirserver.com/document/800511>



REST: “Repository” model of healthcare



Esempio Patient Resource



Estendere la risorsa paziente

Patient (Resource)

identifier : Identifier 0..*
 name : HumanName 0..*
 telecom : Contact 0..*
 gender : CodeableConcept 0..1 <<AdministrativeGender>>
 birthDate : dateTime 0..1
 deceased[x] : boolean | dateTime 0..1
 address : Address 0..*
 maritalStatus : CodeableConcept 0..1 <<MaritalStatus>>
 multipleBirth[x] : boolean | integer 0..1
 photo : Attachment 0..*
 communication : CodeableConcept 0..* <<Language>>
 careProvider : Resource(Organization) 0..1
 managingOrganization : Resource(Organization) 0..1
 active : boolean 0..1

Sì, ma a noi serve:

- Cittadinanza
- Luogo di nascita
- ...

In questi caso puoi aggiungere delle **extensions**:
FHIR definisce anche delle estensioni “standardizzate”!

Animal

species : CodeableConcept 1..1 <<AnimalSpecies>>
 breed : CodeableConcept 0..1 <<AnimalBreed>>
 genderStatus : CodeableConcept 0..1 <<AnimalGenderStatus>>

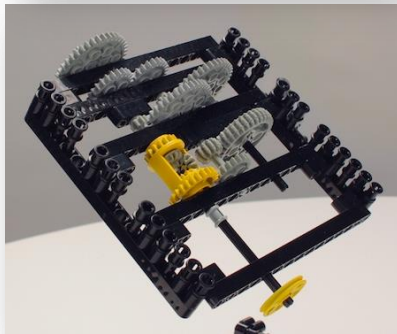
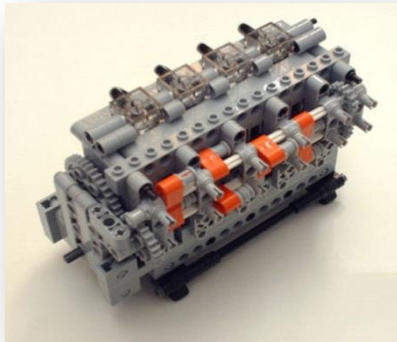
Link

other : Resource(Patient) 1..1
 type : code 1..1 <<LinkType>>

Contact

relationship : CodeableConcept 0..* <<ContactRelationship>>
 name : HumanName 0..1
 telecom : Contact 0..*
 address : Address 0..1
 gender : CodeableConcept 0..1 <<AdministrativeGender>>
 organization : Resource(Organization) 0..1

Profili FHIR



+

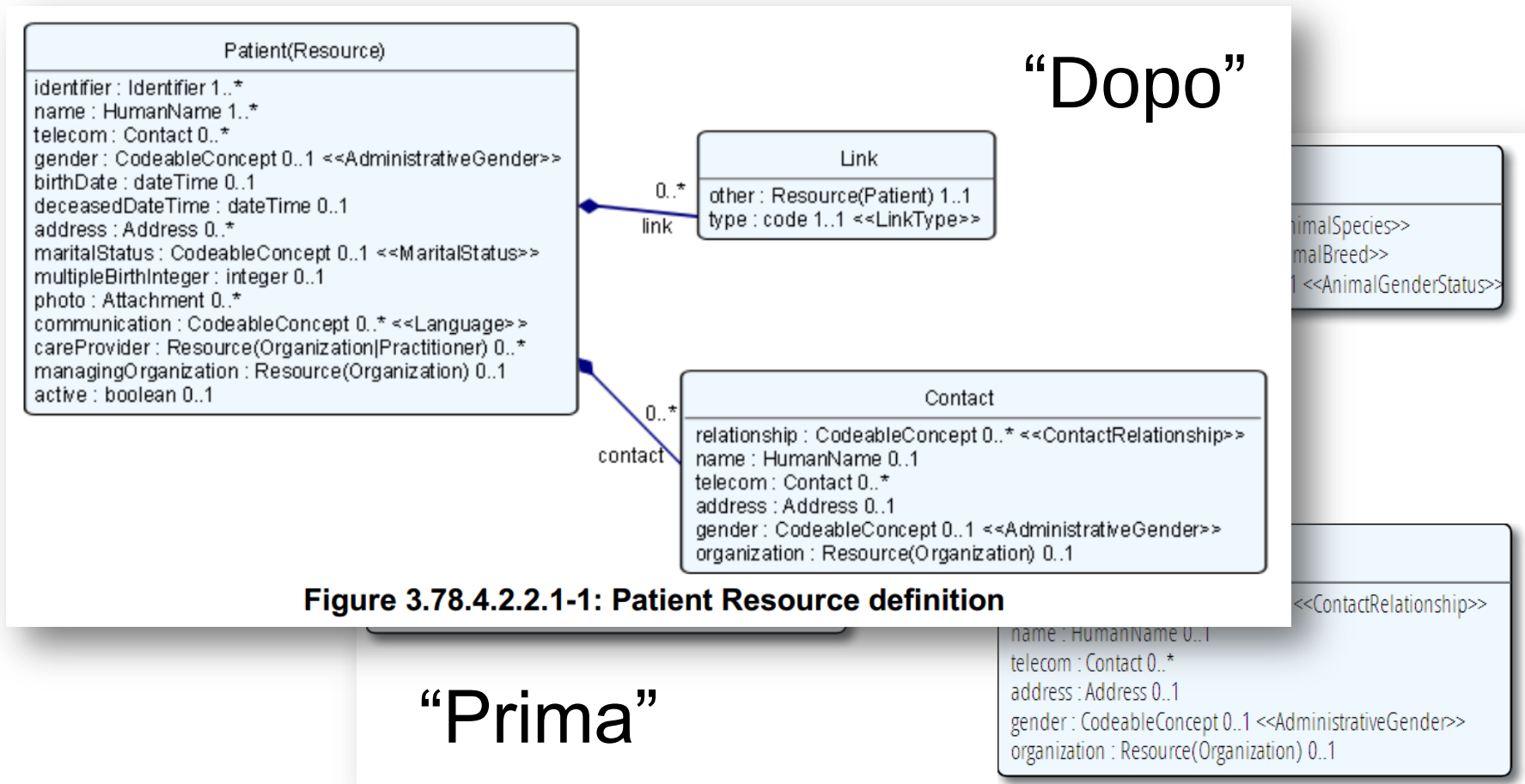


=

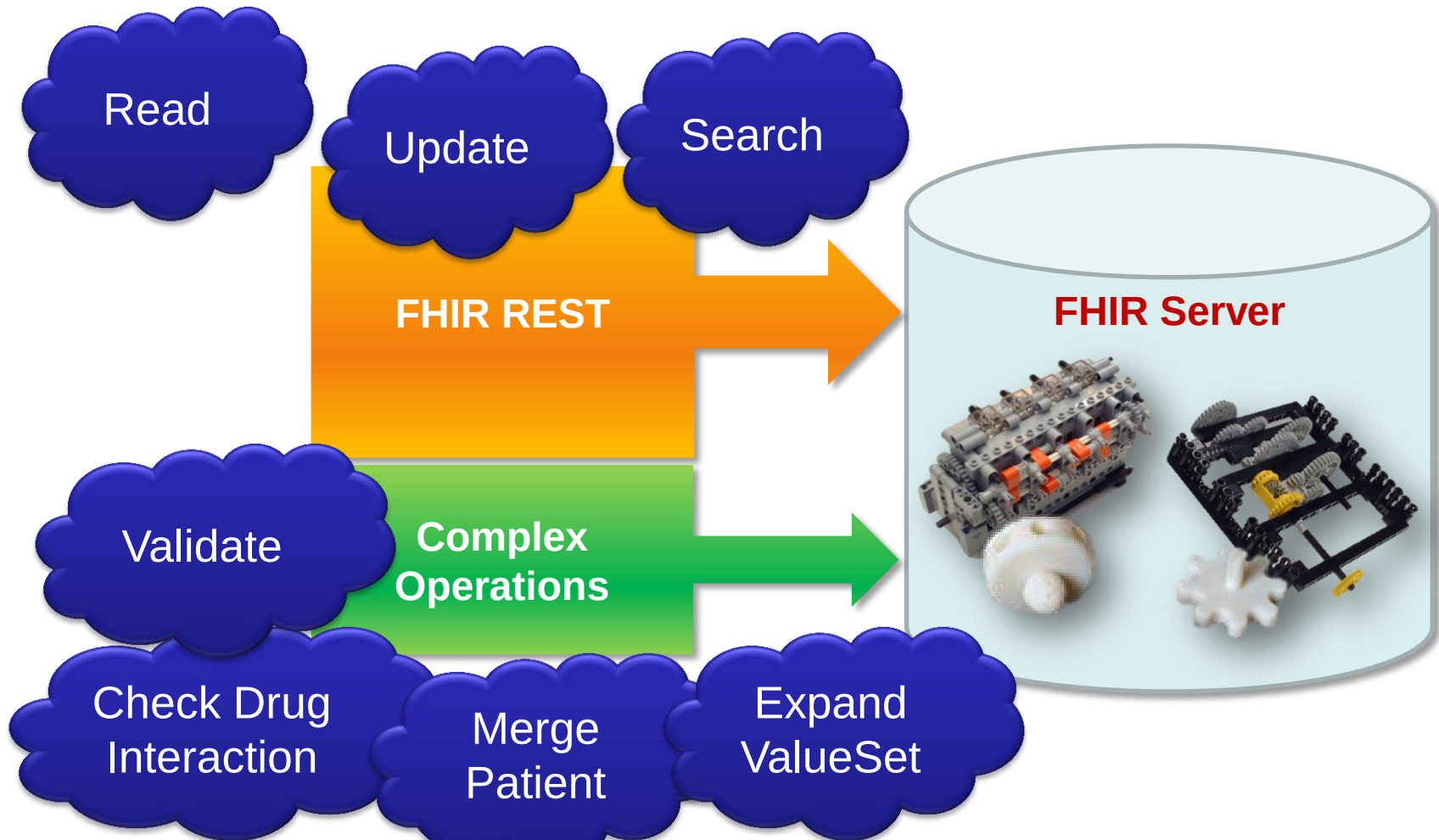


Tutti hanno bisogno di estensioni ..ma tutti le odiano!

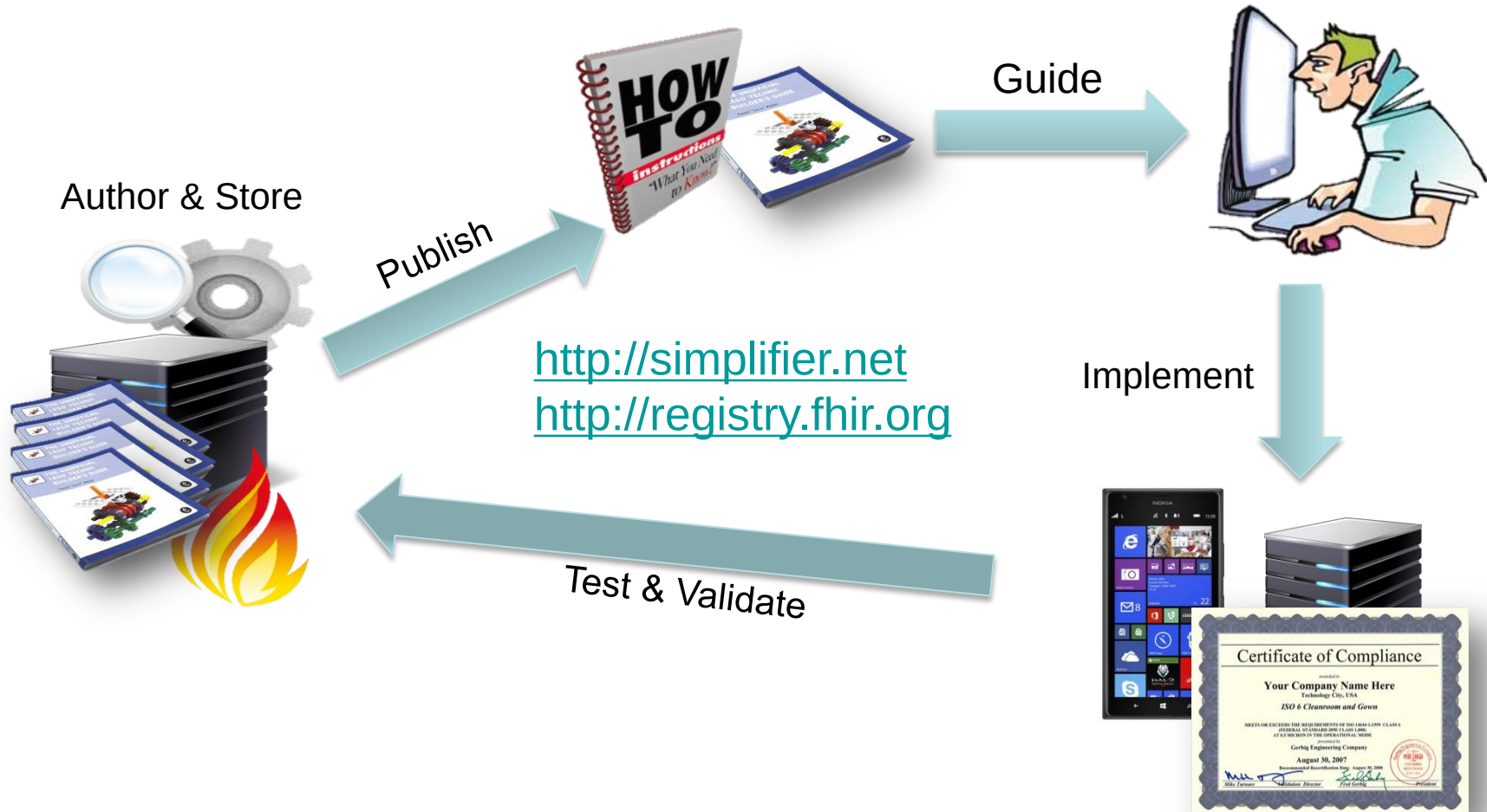
StructureDefinition Resource (profile, template)



Adattare le API



Publiccare!





ASSOCIAZIONE ITALIANA
SISTEMI INFORMATIVI IN SANITÀ

Associazione Italiana Sistemi Informativi in Sanità eHealth 2020



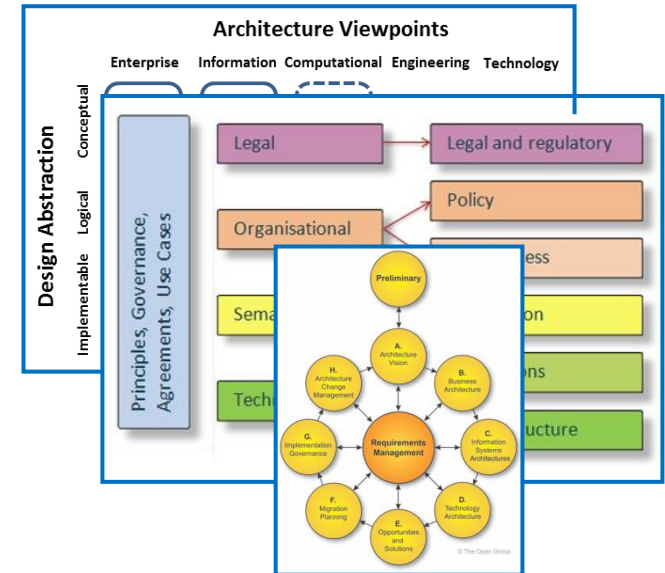
...In sintesi...

FHIR

- FHIR è adatto per applicazioni in un ampio spettro di ambiti:
 - Il classico scambio di dati intra-istituzionale tra sistemi
 - Personal cloud, social media e mobiles applications
 - in ambito regionale (Regional Health Information Organizations)
 - Su scala nazionale, e.g. sistemi EHR nazionali
- La maggiore attenzione e crescita è attesa nei social media e nelle mobile applications

FHIR non è la “pozione magica” (o “*silver bullet*”)

L'interoperabilità richiede di tener conto di una ampia molteplicità di aspetti



FHIR può rendere la tecnologia più semplice...ma non li può risolvere al vostro posto !

FHIR

- Veloce da imparare, realizzare e per risolvere i problemi
- Maturo perché negli anni sono stati raccolti una quantità rilevante di feedback
- Adozione spontanea (di uno standard!)
- Ha una community open source «vivace» e frequenti connectathons

FHIR Community

Page: 1 2 3 4 5 6 170 171 172 173 **174 (4342 Total Records)**

New Tracker Item

ID	Summary	Priority
9777	BackboneElement specialization names need to be set to remove duplicate classnames in some of the code generation tools	Med
9776	Typo in Bundle references example	Med
9775	Misspelled search parameter for ExplanationOfBenefit claimidentifier	Med
9774	Create required core profile for Vital Sign	Med
9773	Allow CommunicationRequest resource to have Group as a recipient	Med
9772	QA: Patient deathdate search parameter does not conform to style guide	Med
9771	Two typos in...	Med

Announcements

argonaut

- cda to fhir 335
- cds-hooks 34
- clinFHIR 323
- committers 62
- conformance**
 - Forge - ElementDefinition.b... 6
 - Simplifier - Icon 5
 - Fixing resource type for ref... 8
- Profiling CodeableConcept 4 (more topics)
- dotnet
- javascript
- netherlands

conformance **Profiling CodeableConcept**

Michel Rutten
Hi Richard, I am not completely clear how to reproduce...
I've created a profile on CodeableConcept and constr...

conformance **Query re the Conformance resource**

Josh Mandel
I continue to think that requiring custom generated a...
field (or will populate it meaningles...

Michel Rutten
Note: Forge currently doesn't respond well to Structu...
required, so you should always specify a valid and un...
gracefully handle an invalid StructureDefinition. So w...

Grahame Grieve

<https://chat.fhir.org/>

<https://chat.fhir.org/#narrow/stream/italy>

Connectathons




Current Build

[Home](#)
[Getting Started](#)
[Documentation](#)
[Resources](#)
[Profiles](#)
[Extensions](#)
[Operations](#)
[Services](#)

Home

This is the Continuous Integration Build of FHIR (will be incorrect/inconsistent at times). See the [Directory of published versions](#)

Welcome to FHIR®

First time here? See the [executive summary](#), the [developer's introduction](#), [clinical introduction](#), or [architect's introduction](#), and then the [FHIR overview / roadmap](#). See also the [open license](#) (and don't miss the full [Table of Contents](#) or you can [search this specification](#)).

 Clinical Reasoning Decision Support, Clinical Quality Measures				
 Clinical Allergy, Problem etc	 Diagnostics Observation, Report, Request etc	 Medications Order, Dispense, Administration, Statement etc	 Workflow Task, Subscription etc	 Financial Claim, EligibilityRequest etc
 Administration Patient, Practitioner, Device, Organization, Location, Healthcare Service				
 Implementer Support Downloads Common Use Cases	 Security & Privacy Security Consent	 Conformance StructureDefn Conformance	 Terminology CodeSystem ValueSet	 Ontology RDF todo

<https://www.hl7.org/fhir>



Grazie per l'attenzione!

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