# HL7 FHIR – Connecting the old to the new world
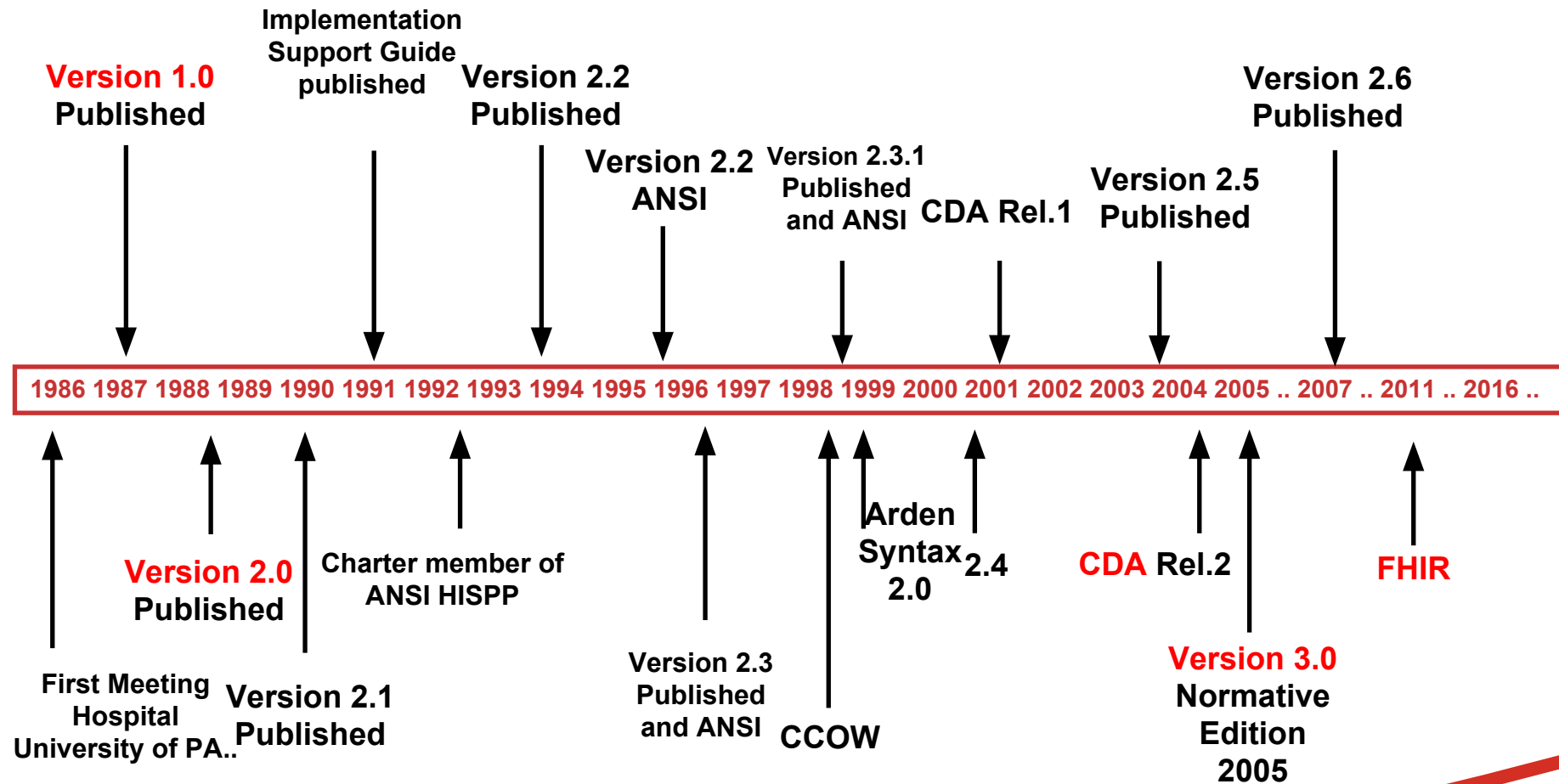
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# Health Level 7

- 'Standards Developing Organisation' (SDO)
- International Organisation of Volunteers
- Working Group Meetings, eMail/Chats, ConfCalls, Wiki
- Mission Statement: 'HL7 empowers global <u>health data interoperability</u> by developing <u>standards</u> and enabling their adoption and implementation'

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# History of HL7



Version 1.0 Published

Implementation Support Guide published

Version 2.2 Published

Version 2.2 ANSI

Version 2.3.1 Published and ANSI

CDA Rel.1

Version 2.5 Published

Version 2.6 Published

1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 .. 2007 .. 2011 .. 2016 ..

Version 2.0 Published

Charter member of ANSI HISPP

Arden Syntax 2.0

2.4

CDA Rel.2

FHIR

First Meeting Hospital University of PA..

Version 2.1 Published

Version 2.3 Published and ANSI

CCOW

Version 3.0 Normative Edition 2005

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# Who we are

„gefyra" is the Greek word for „bridge"

We offer
- FHIR training,
- consultancy for FHIR projects
- professional tooling
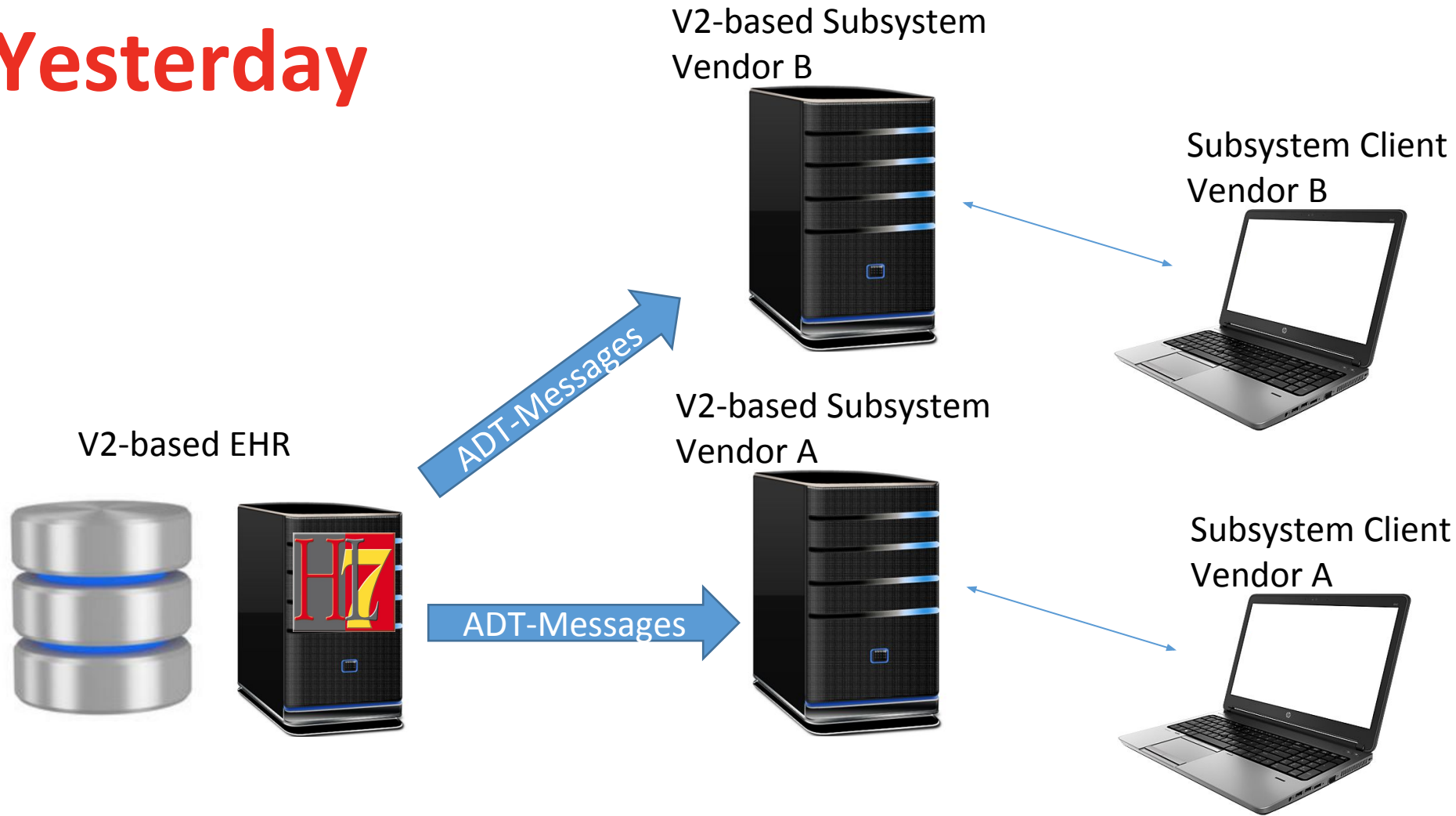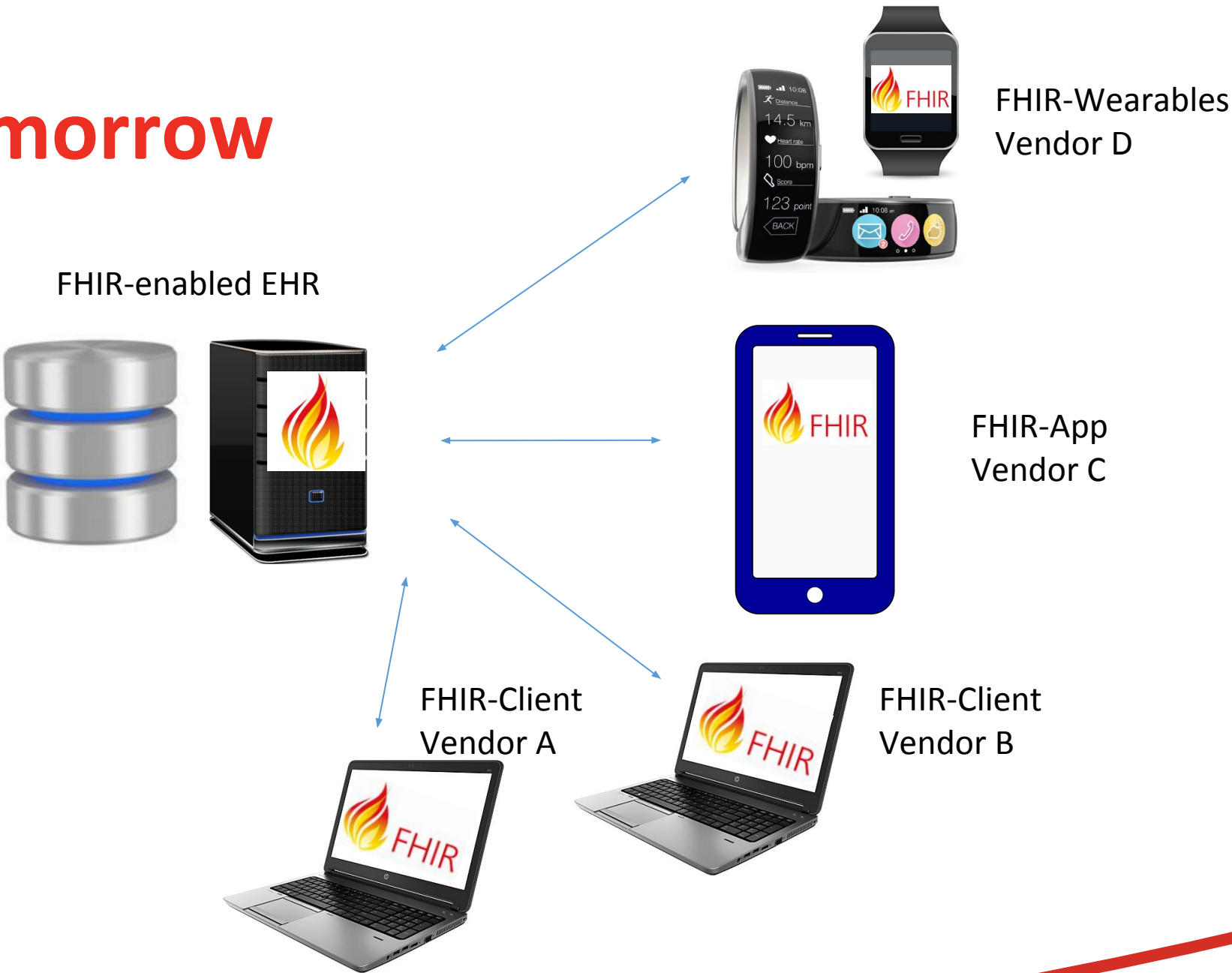- integration services (j/w Health-Comm, based on Infor Cloverleaf®)

# Tomorrow

FHIR-Wearables
Vendor D

FHIR-enabled EHR

FHIR-App
Vendor C

FHIR-Client
Vendor A

FHIR-Client
Vendor B

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# Integrating FHIR is easier than you think!

- FHIR re-uses many artifacts from established standards
- e.G. ValueSets from V2 and V3
- *DocumentReference* aligns with IHE-XDS metadata
- *ImagingStudy* aligns with DICOM image metadata
- *AuditEvent* aligns with DICOM Audit Trail
- *Composition* aligns with CDA structures
- Datatypes align with ISO-Standards, UCUM units etc.
- FHIR has an API for mapping codes and structures
- FHIR allows the standardized exchange of mappings

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# Integrating FHIR is also harder than you think!

- Most established standards follow the *event-driven* approach
  (The server exports data, when an event occurs)

- FHIR follows (mainly) the *query-driven* approach
  (The client requests the data, when it needs it)

- FHIR *explicitly* links data (through references), while other standards often use *implicit* linkage

- To broker between a V2 System and a FHIR Client, you need a FHIR-Server as an intermediary

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# Today

V2-based EHR

Integration Engine
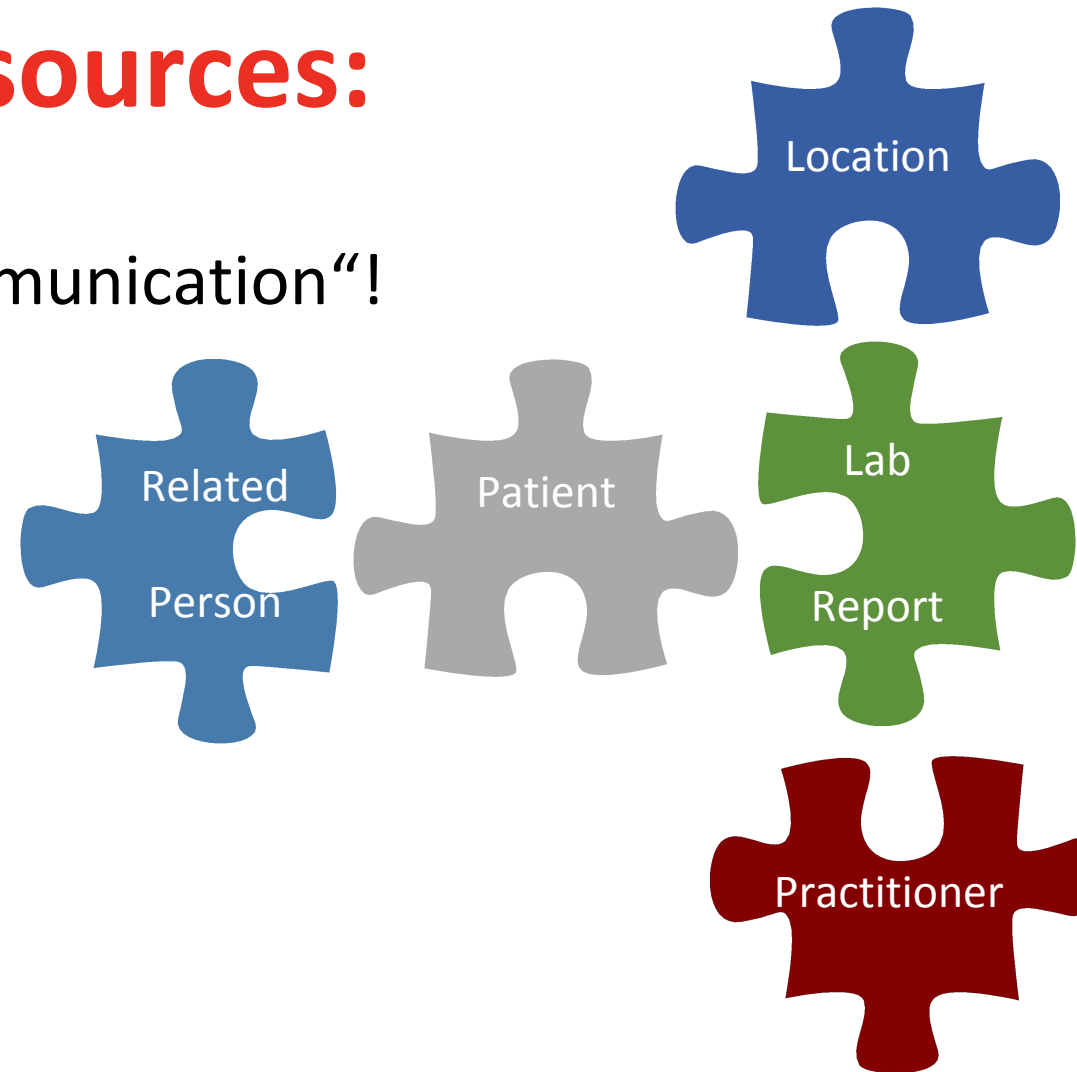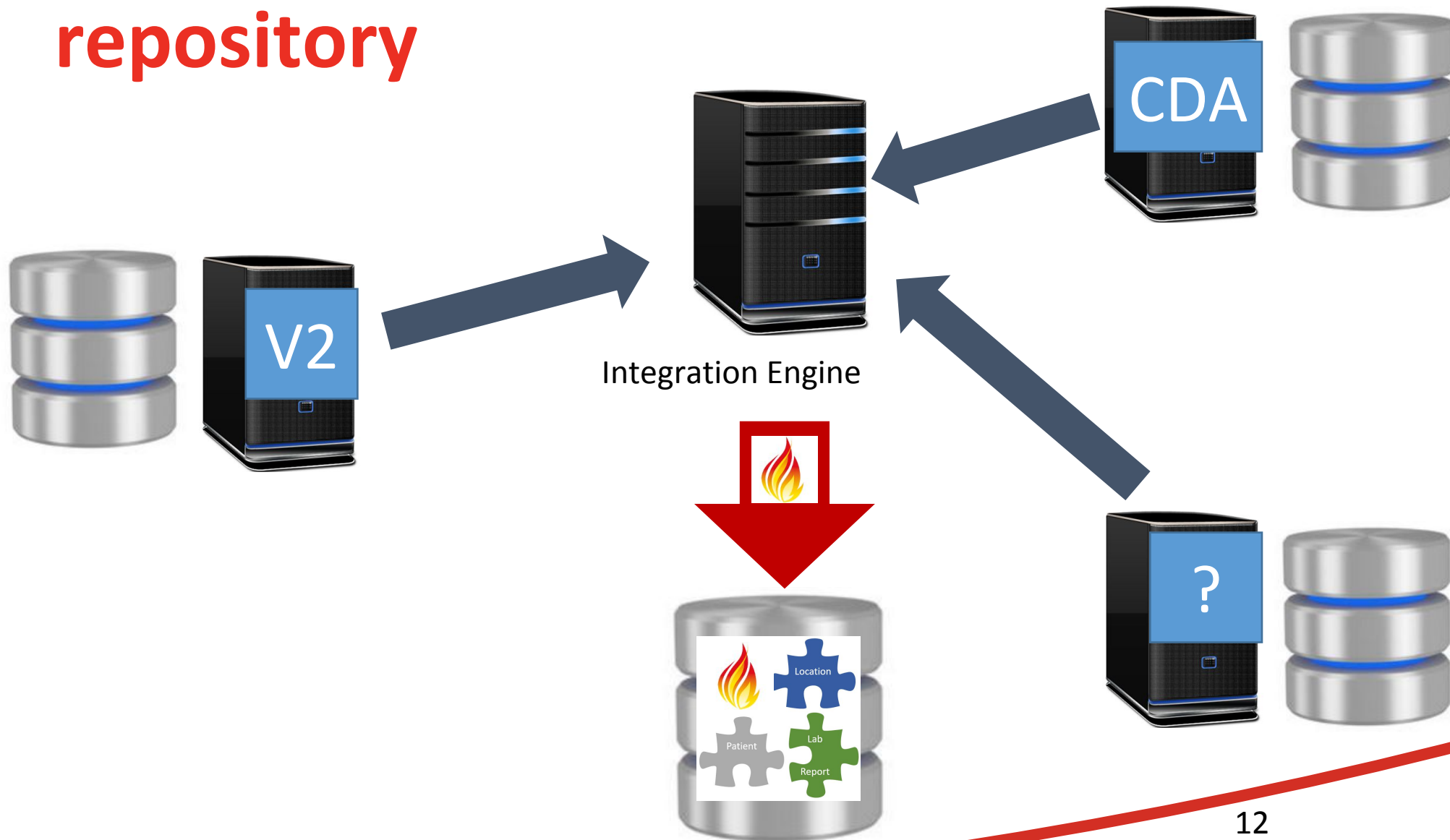
FHIR-Server

ADT-Messages

FHIR-Transaction

FHIR

FHIR

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# Why it is worth it...

# Die FHIR-Resources:

Think beyond „communication"!

# FHIR as standardized data repository



Integration Engine

# Consider the paradigm shift in healthcare

- Online instead of offline

- Mobile devices instead of desktop PCs

- Apps instead of software suites

- Cloud based services instead of local server farms

- open APIs instead of data silos

- flexible analysis instead of static reporting

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# FHIR has much to offer!

- Integrated support for localization and specialization (Conformance Framework)

- OAUTH2-based autorization and authentification framework (SMART)

- CDS integration framework (CDS-Hooks)

- Terminology services

- Bulk data export („Flat FHIR")

- Integration with statistics and reporting tools („R on FHIR")

- Implementation support (code libraries, test scripts and validation tools) …everything you need to build better software faster!

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# FHIR boldly goes where ~~no~~ few other standards have gone before…

- Genomics
- Precision Medicine
- Nutritional Health
- Data exchange between clinical and research domains
- Clinical Decision Support
- Privacy and Security
- Workflow Management
- Public Health & Research
- Regulatory Data Exchange

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# FHIR is the future!

- Big global players have adopted FHIR
  (Apple, Google, Microsoft, SAP, Cerner, McKesson, Infor…)
- Many FHIR-based national healthcare infrastructures are currently in production/in developement (US, UK, Denmark, Australia, Canada, Vietnam…)
- The community is thriving in
  - Discussing FHIR
  - Driving the development of the standard
  - Creation of tooling, open source software and libraries

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test d. fine undefined undefined
Hide Selector

Import resource
Show version

Save to Library
View Library

Local
Scenarios

New Scenario

Description    List    Graph    Mark

Add Resource

Hide Patient

**Chile Tumorboard Exercise** ✕



Medication
Aspirin

medication[x]

MedicationStatement

ImagingStudy
X-Rays of Tumor post

ImagingStudy
X-Rays of Tumor pre-

QuestionnaireResponse
Patient filled out a

subject

subject

patient    patient

Condition
Diagnosesicherheit

subject

Organization
Hospital A

viceProvider

managingOrganization

Encounter
Post surgery

Patient
This is our cancer p

patient

generalPractitioner

patient    serviceProvider    episodeOfCare

Organization
GP Practice

patient

patient

EpisodeOfCare

serviceProvider

Encounter
Pre surgery outpatie

subject

subject

Encounter
Inpatient Encounter

deOfCare

Condition
Skincancer

indication

# ZULIP

🔍 Search

🏠 **Home** `880`

✉ Private messages `1`

⭐ Starred messages

🏷 @-mentions

**STREAMS** ➕ 🔍 ⚙

🟦 german (d-a-ch) `9`

🟦 analytics on FHIR `5`

🟨 Announcements

🟥 cds-hooks `55`

🟩 cds-hooks-github `35`

🟪 committers `412`

🟧 conformance `18`

🟩 connectathon mgmt

🟩 español

🟦 FHIR-Praxisworkshop

🟪 fmg (members only) `5`

🟨 implementers `817`

🟥 netherlands

🟪 smart `3`

🟩 social

🟨 students `2`

🟥 terminology `33`

🟥 v2 to FHIR

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**implementers** 〉 Representing a Tumor    May 24

Orders and Observations Work Group and btw anybody welcome to lob comments on the tracker as follow-ups. :-)

EDITED   I am proposing the element name `category` . 'kind' and 'type ' and 'code' are all intertwined in meaning so I tend to stay away from them.    9:02 PM

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**implementers** 〉 Add an attachment to a /ReferralRequest

**Tim Berezny**    9:48 PM

Hi, this is my first post here, i see it's very active! I would like to ask a question:

I'm developing a /ReferralRequest module (to receive eReferrals). One need i have is to send attachments with the payload (e.g., PDFs.). I'm trying to figure out the best way to do it, but can't quite figure out what the most accepted approach is. So far I've considered:
1) Using ReferralRequest.SupportingInfo to reference a /DocumentReference
2) Using ReferralRequest.SupportingInfo to reference a /DocumentManifest
3) Using referralRequest.SupportingInfo to reference a /Attachment
4) Adding an extension
5) Other?

I want to chose one core way that is the simplest yet flexible approach, so that it could handle one or many documents. What would be the best way to attach a document to a /ReferralRequest.

Any assistance is greatly appreciated!

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**implementers** 〉 Adding "old" to Identifier.use

**Grahame Grieve**    9:54 PM

I'd like to clarify the definition of 'valid' for all those types while we're at it. An address doesn't become invalid because I no longer live there. It's my association with the address that is no longer valid. Same for the other types. I'd like to clarify the language on old for all types to make this clear

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**implementers** 〉 profiling problem with slices

**Rick Geimer**    9:59 PM

Would be better to get pattern-based slices working in the IG publisher. Lloyd, is this restricted to the IG publisher code, or do you think this is something deeper? If just in the IG publisher I'm happy to take a look early next week and try fixing the bug.
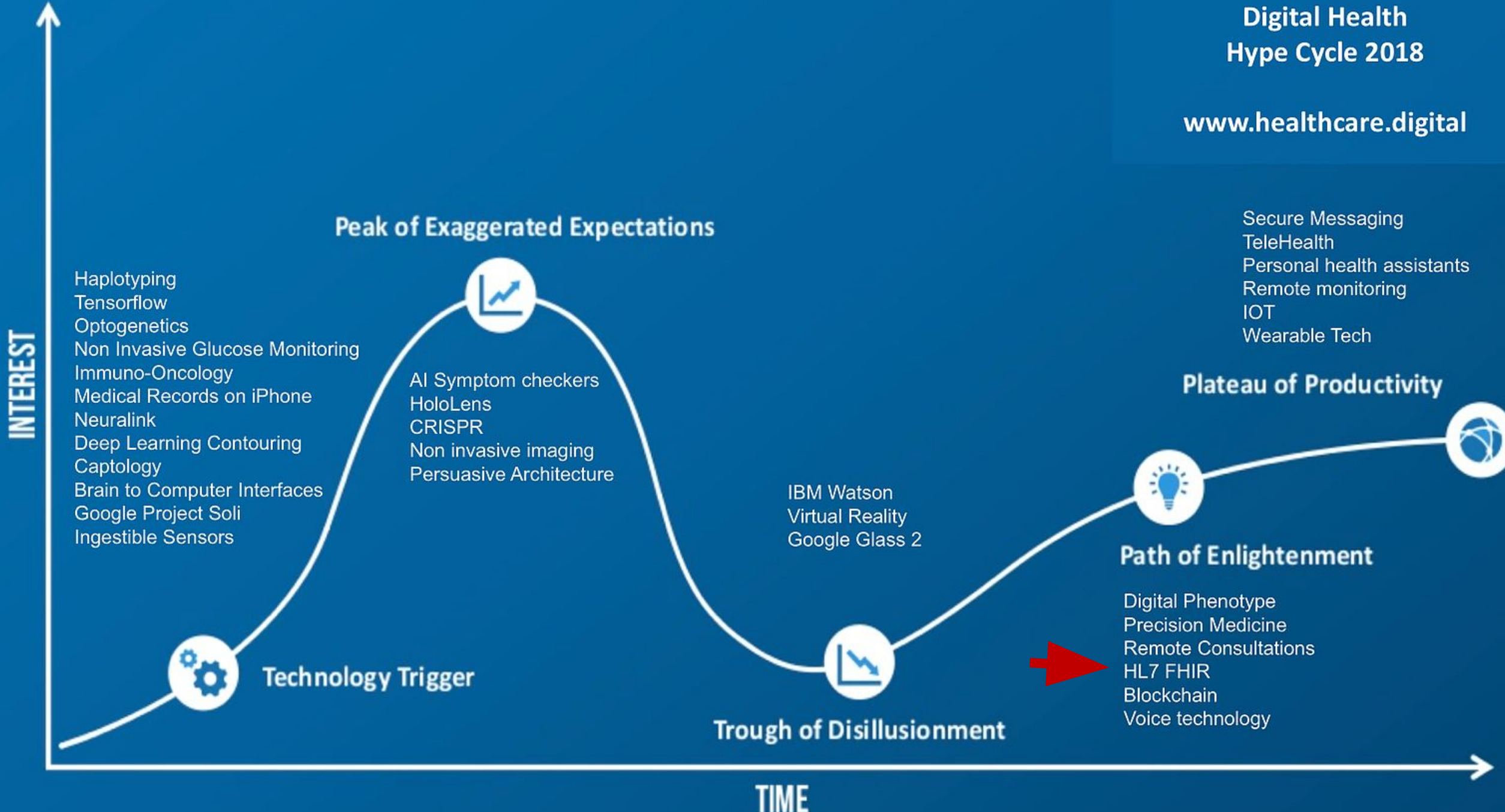
Basically I worry that we are restricting what can be legally expressed in profiles to what we currently support in the IG publisher.    10:06 PM

Digital Health Hype Cycle 2018
www.healthcare.digital

**Peak of Exaggerated Expectations**

Haplotyping
Tensorflow
Optogenetics
Non Invasive Glucose Monitoring
Immuno-Oncology
Medical Records on iPhone
Neuralink
Deep Learning Contouring
Captology
Brain to Computer Interfaces
Google Project Soli
Ingestible Sensors

AI Symptom checkers
HoloLens
CRISPR
Non invasive imaging
Persuasive Architecture

Secure Messaging
TeleHealth
Personal health assistants
Remote monitoring
IOT
Wearable Tech

**Plateau of Productivity**

IBM Watson
Virtual Reality
Google Glass 2

**Path of Enlightenment**

Digital Phenotype
Precision Medicine
Remote Consultations
HL7 FHIR
Blockchain
Voice technology

**Technology Trigger**

**Trough of Disillusionment**

INTEREST

TIME

lloyd@healthcare.digital

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