Semantic Harmonization of Standards

NCVHS Standards Subcommittee Listening Session - Panel 3

August 2021

Wayne Kubick
HL7 CTO
wkubick@hl7.org

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About Health Level 7 International

ANSI-accredited, non-profit
Standards Development Organization
Founded in 1987

The HL7 Vision

A world in which everyone can securely access and use the right health data when and where they need it.

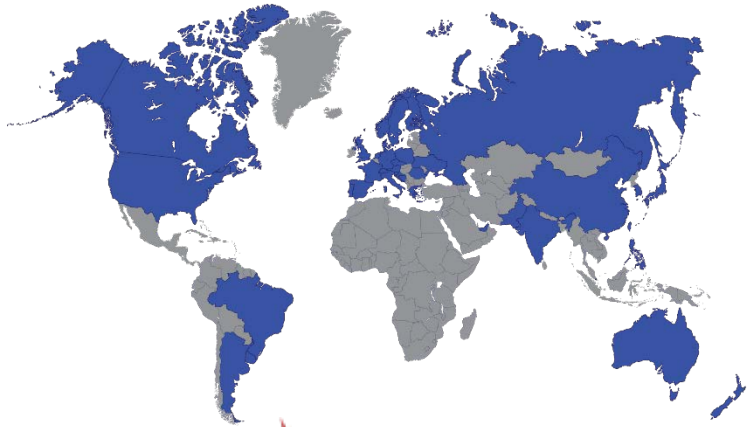
The HL7 Mission

To provide standards that empower global health data interoperability.

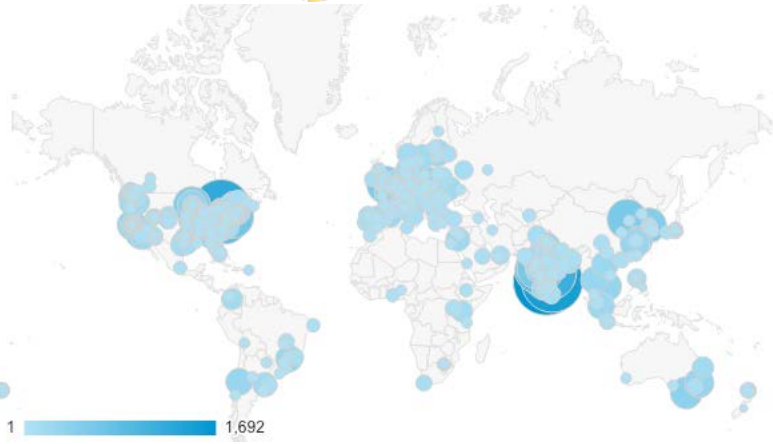
HL7 Products

>350 specifications, with 3 primary product families: v2, v3 CDA and HL7 FHIR.

HL7 Affiliates



HL7 FHIR



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The Fundamentals of FHIR
Fast Healthcare Interoperability Resources

- A next generation, *open-source standards framework & platform*, designed for implementation
- Built on REST, a pattern for using web technologies to manage information and APIs
- Content based on human-readable *Resources*: essential, portable modular information building blocks of common elements easily assembled into working systems
  - Like web pages directed toward computers; fast and scalable
- Flexible outputs: web services, messages, documents, bulk data domain files
- Components for Mobile Health (SMART-on-FHIR), Clinical Decision Support (CDS-Hooks), Image Integration (FHIRCast) and many other functions
- A *technology platform*, a *data model*, and an active, global *community (>17000 active members worldwide; 100's of servers, apps, testing environments and shared reference materials)*

"The Web, for Healthcare" – Grahame Grieve

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HL7 FHIR

This page is part of the FHIR Specification (v4.0.1: R4 - Mixed Normative and STU). This is the current published version. For a full list of available versions, see the Directory of published versions

4.1 Using Codes in Resources

FHIR Infrastructure Work Group	Maturity Level: Normative	Standards Status: Normative

This page has been approved as part of an ANSI standard. See the Infrastructure Package for further details.

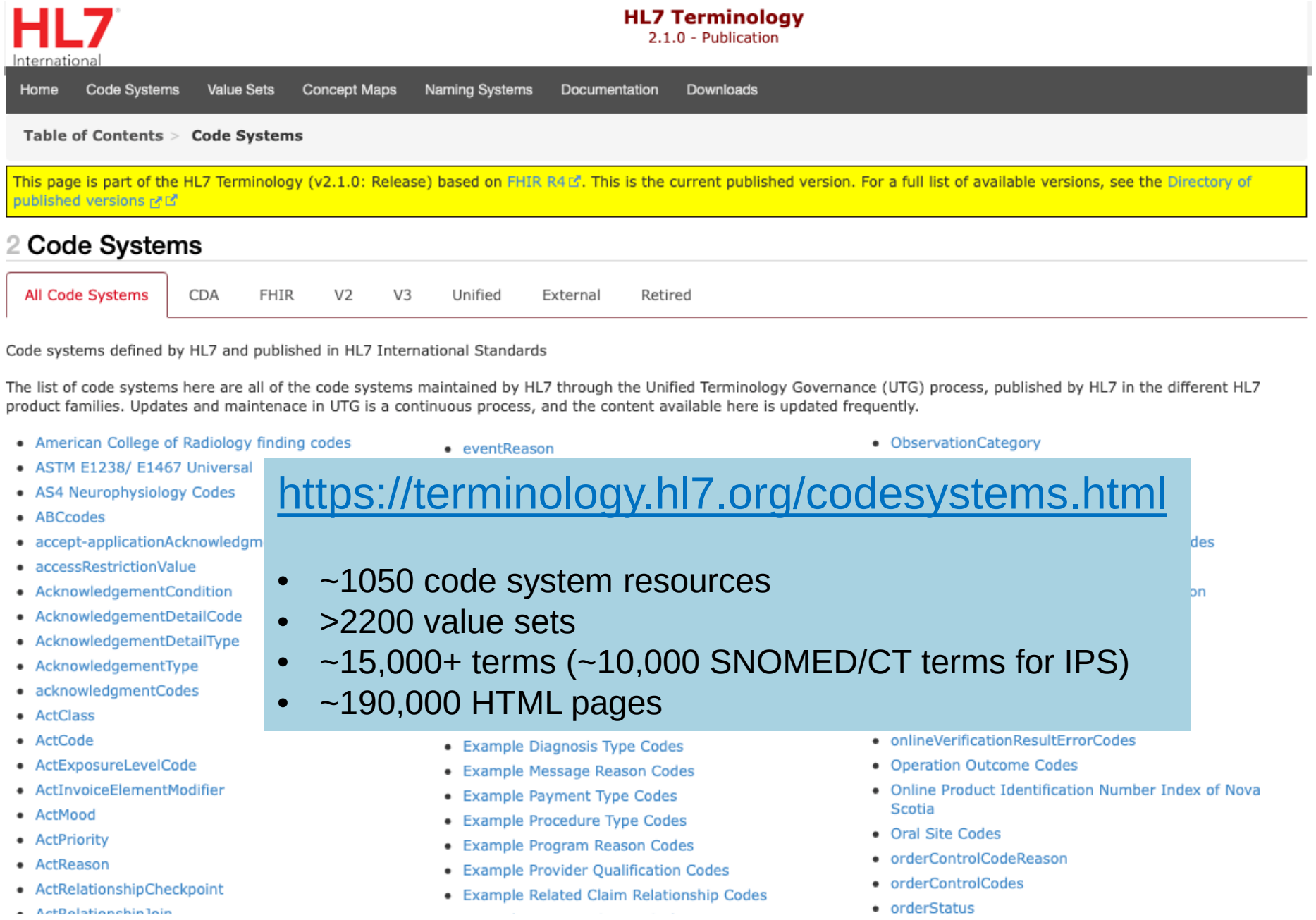
Many elements in the FHIR resources have a **coded value**: some fixed string (a sequence of characters) assigned elsewhere that identifies some defined "concept". The sequence of characters and its meaning may be defined in one of several places:

- As one of a set of fixed values defined in this specification
- In an internet RFC (e.g. mime type, language)
- An HL7 specification (HL7 v3 code system, or HL7 v2 table)
- Some external terminology or ontology such as LOINC, or SNOMED CT
- A locally maintained dictionary, look up table or enumeration in an application (for further discussion of locally defined value sets, see "Profiling FHIR"

These methods of defining codes are collectively called "code systems". This list is far from complete; there are many ways to define code systems, and they vary widely in sophistication and size.

Throughout this specification, coded values are always treated as a pair composed of "system" and "code", where the system is a URL that identifies the code system that defines the codes. Note that `system` values are always case sensitive. Different code systems make their own rules as to whether the codes they define are case sensitive or not. Note that all the codes defined by FHIR itself are case sensitive and SHALL be used in the provided case (usually, but not always, lowercase).

The FHIR framework for using coded values is based on the fundamental framework defined in section 5 of the HL7 v3 Core Principles document, including the separation between code systems and value sets.



Implementation Guides and Profiles

- FHIR is a base standard that must be tailored for the many different contexts in healthcare.
- Semantic consistency is enforced by compliance with FHIR Implementation Guides
- Implementation Guides consist of profiles, which specify terminology bindings, extensions and constraints

Example – US Core Patient Profile

The official URL for this profile is: `http://hl7.org/fhir/us/core/StructureDefinition/us-core-patient` Copy

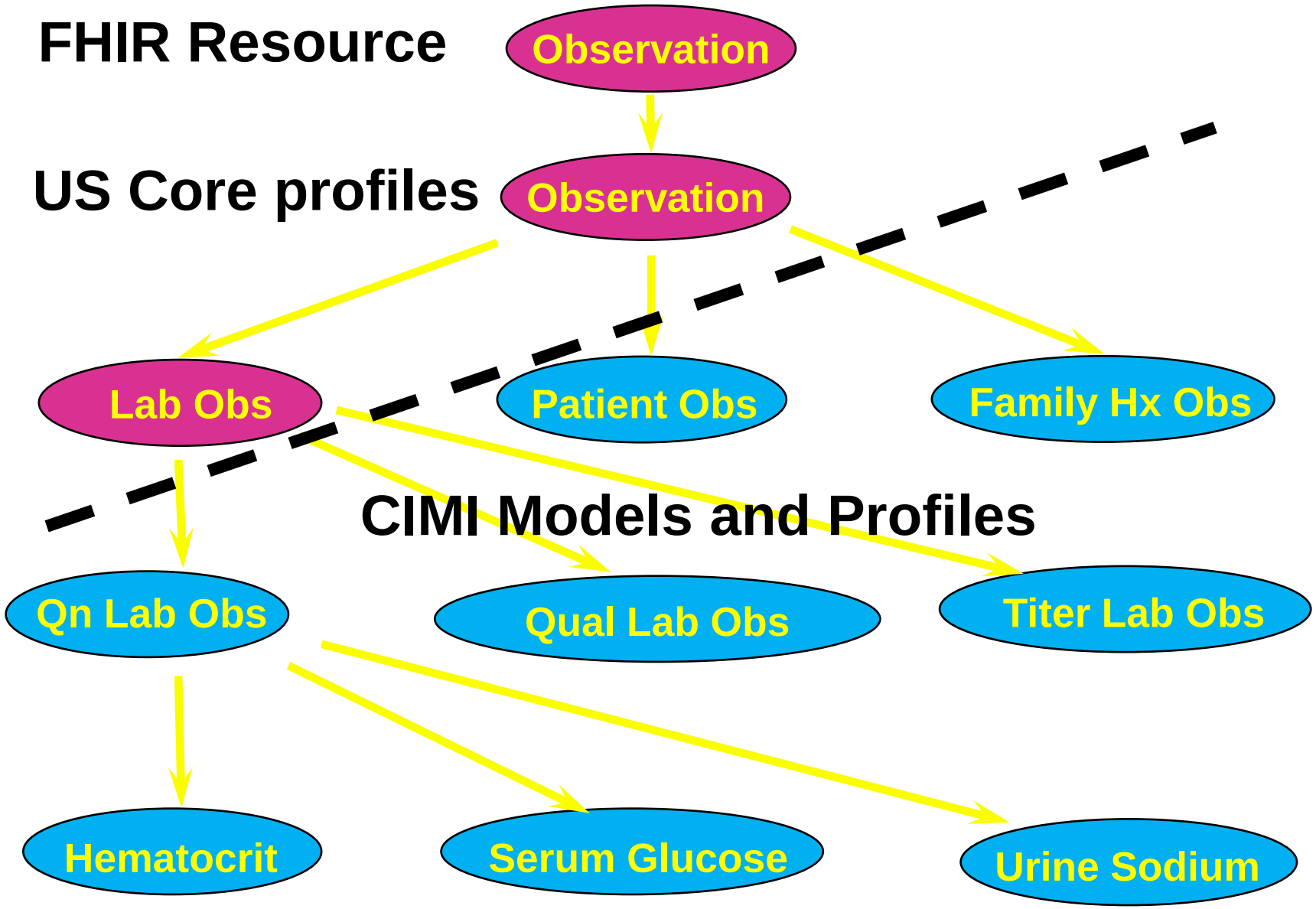
Published on Sat Jun 27 00:00:00 AEST 2020 as active by the HL7 US Realm Steering Committee.

This profile builds on Patient

Text Summary | Differential View | Full View | All Views

Name	Flags	Card.	Type	Description & Constraints
Patient		0..*	Patient	Information about an individual or animal receiving health care services
us-core-race	S	0..1	(Complex)	US Core Race Extension **URL:** http://hl7.org/fhir/us/core/StructureDefinition/us-core-race
us-core-ethnicity	S	0..1	(Complex)	US Core ethnicity Extension **URL:** http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity
us-core-birthsex	S	0..1	code	Extension **URL:** http://hl7.org/fhir/us/core/StructureDefinition/us-core-birthsex **Binding:** Birth Sex (required)
identifier	S	1..*	Identifier	An identifier for this patient
system	S	1..1	uri	The namespace for the identifier value
value	S	1..1	string	The value that is unique within the system.
name	S I	1..*	HumanName	A name associated with the patient **us-core-8:** Either Patient.name.given and/or Patient.name.family SHALL be present or a Data Absent Reason Extension SHALL be present.

HL7 Clinical Information Modeling Initiative (CIMI) Logical Models and US Core Profiles



Source: Stan Huff

CIMI Leaf Node Content: Preferred structure, standard extensions, explicit LOINC and SNOMED, units, magnitude, …

Semantic Harmonization and HL7

- HL7's vision and mission focuses on achieving semantic interoperability
- HL7 believes the path toward this goal will be based on use of the HL7 FHIR platform and FHIR global community
- Semantic interoperability will be based on conformance with FHIR profiles in standard FHIR Implementation Guides
- Additional methods and tools for mapping/translating/ converting individual code systems will also be necessary.

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