Draft Pan-Canadian Health Data Content Framework

Metamodel

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(for review and reference only, not an official version)

Canadian Institute for Health Information

Institut canadien d'information sur la santé

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Introduction

The Canadian Institute for Health Information (CIHI) is developing the Pan-Canadian Health Data Content Framework, which defines, standardizes, and models the health data required to enable connected care in Canada.

The Pan-Canadian Health Data Content Metamodel is one of several products packaged in the Pan-Canadian Health Data Content Framework.

What is the Metamodel?

The metamodel is a model that describes the components of the Pan-Canadian Health Data Content Framework and the relationships between them. It defines the types of framework components such as business concepts, logical data model, data exchange, and business glossary, among others.

The Pan-Canadian Health Data Content Framework Metamodel is and will be used to:

- Help define the scope of the framework and therefore ensure framework completeness.
- Convey different stakeholder views such as a business view, a technical view, etc.
- Provide consistency and structure to the architectural thinking.
- Plan the delivery of architectural artifacts in phases or releases to support the overall framework strategy and plan.

Audiences

The audiences for the Metamodel are individuals with lived experience, people and communities, health care providers, governing bodies, organization leaders, researchers, and technical users, as well as members of the public who would like to know more about the components of the Pan-Canadian Health Data Content Framework.

Development approach

All deliverables for the Pan-Canadian Health Data Content Framework were broken down into their core components and grouped together thematically. Notes and examples were added to provide additional context for the reader.

Help us shape the Metamodel

Your feedback is critical to the development of the Metamodel. We are asking the public to help us identify key missing concepts, provide feedback on key concept definitions, and validate core relationships at a high level.

Please complete the feedback survey at this link.

Metamodel

Metamodel Description

The metamodel components are organized in three different sections: the Business Concepts, the Logical Data Model Representation, and the FHIR Physical Representation for Data Exchange. The three sections are connected and should be read in sequence as follows:

Start with the Business Concepts whose components and relationships are expressed in the Logical Data Model Representation which in turn provides the precise set of data model elements, attributes, and model constraints required to develop the FHIR Physical Representation for Data Exchange.

Business Concepts Components

Represents the business view of the data. The key components in this section are:

- Data Element. A distinct unit of information that represents a specific attribute or characteristic in a data set. Examples include given name, person address type, or birth date.
- Value Set. The finite set of permitted values (codes), drawn from one or more code systems, for a data element representing a codeable concept. Examples of value sets are Jurisdiction, Racialized Group, Language, and Sex At Birth.
- Data Set. A grouping of Data Elements brought together into a specification for collection or analysis for specific transactions, use cases for data exchange, or specific outcomes. Examples of Data Sets are eReferral, eConsult, IPS, and Immunization.

- Business Glossary. Provides terms, their definitions, and semantic relationships describing clinical and architecture concepts used across the Pan-Canadian Health Data Content Framework

The remaining business components presented in this section are mostly used to classify and categorize the data elements.

Logical Data Model Representation

Expresses the business view and real-life business concepts in a technology-agnostic relational data model. The key elements of this component are:

- Entity. An encapsulation of data that is recognized by a domain expert as a representation of a discrete concept. An entity includes clinical concepts related to health care such as "immunization" as well as supporting concepts such as "metadata", "code", and "business glossary".
- Attribute. A characteristic of an entity that provides more specific information to distinguish it from other entities. As an example, attributes for the Immunization entity are Dose Quantity, Dose Unit of Measure Code, Immunization Reason Code, and Immunization Body Site Code.
- Attribute Value Set. A set of codes drawn from one or more code systems, intended for use in a particular context. Similar to the Value Set component in the Business Concepts section but represents its technical view.

Other elements of this component represent how entities are related to each other, and how they are grouped into data categories or presented in views, such as the CACDI View, for stakeholders to consume.

FHIR Physical Representation for Data Exchange

Takes the Business Concepts view and the Logical Data Model Representation to develop a data exchange specification using the FHIR standard. The key elements of this component are:

- Implementation Guide. A set of rules that specify how a particular interoperability or standards problem is solved - typically using FHIR resources. Business Data Set concepts such as e-Referral are defined by an Implementation Guide.
- Profile. A set of constraints on a resource represented as a structure definition with derivation = constraint. Exchange constraints are informed by Logical Data Model constraints to ensure semantic alignment between components in the three sections of the metamodel.
- Resource Element. Individual component of a resource. Examples are patient.name, patient.gender, etc.

- Value Set. Similar to the Attribute Value Set element in the Logical Data Model Representation component but represents its data exchange view.

The Framework Metamodel will continue to evolve and add additional components such as metadata, privacy concepts, and versioning.

Maturity

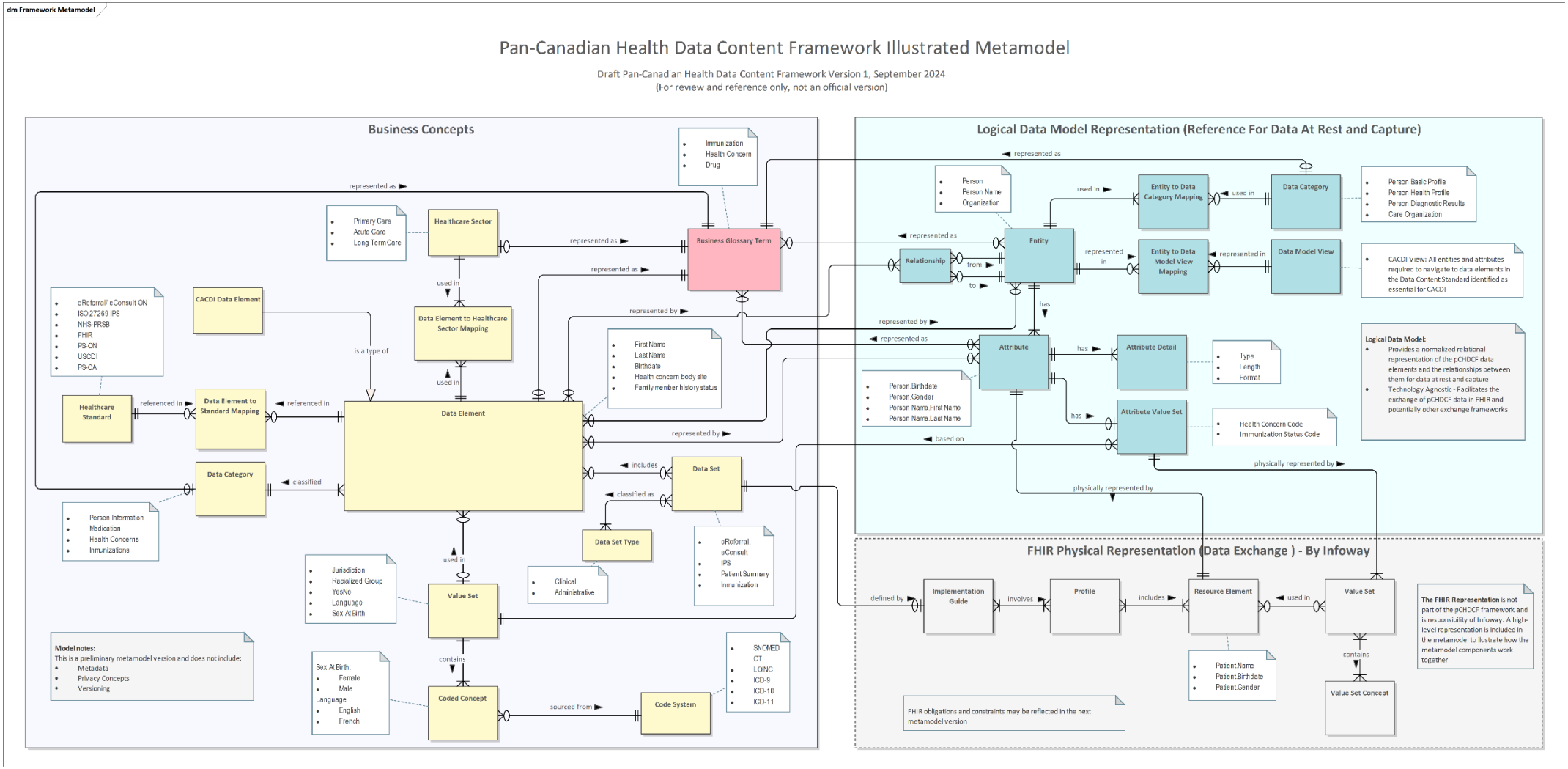
A maturity model (Table 1) was designed to transparently document the readiness of artifacts within the framework, including data elements, value sets, definitions, and data architecture components. The maturity model facilitates tracking the evolution of those artifacts over time, enabling continuous refinement and enhancement based on feedback and emerging needs. The maturity of the framework's deliverables will be re-evaluated with each release. The maturity level of the metamodel is currently 1: Draft.

Table 1 Maturity model

Stage of maturity	Definition
Future development	Coming soon
0: In development	Artifact is a work in progress
1: Draft	Artifact incorporates input from experts
2: Proposed	Artifact has been through at least one round of open public review
3: Ready for use	Artifact is ready for implementation

Appendix A: Static Metamodel

For details, definitions, and an interactive model, please refer to the zipped metamodel HTML file.



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