HL7 Tool Inventory

Deliverable 8

HL7 Processes and Tools Conceptual Model

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1 Introduction

The tooling inventory project for HL7 consists of a set of deliverables, according to the agreement due on August 15:

|   | 8. Create a conceptual view or diagram of the items in the catalogue tool and how they fit together. |

This document presents this conceptual model.

2 Conceptual model assumption

Part of the HL7 Tool Inventory is the creation of a conceptual diagram, view or model which illustrates how the HL7 organization handles its processes and uses tools to support these processes. The HL7 Processes and Tools Conceptual Model starts with the assumption that tools are there to help the HL7 community to get various aspects of their work done. Hence the HL7 Processes and Tools Conceptual Model identifies various organizational aspects, standards activities of various kinds, registries of artifacts, but the main focus are the HL7 processes and how tools support the processes. This document examines the high level interactions but does not provide detailed information on the physical interfaces.
3  HL7 Processes and Tools Conceptual Model

The conceptual model is drawn up as a mind map in Enterprise Architect and defines three layers, each layer represented by a color (Figure 1). The pinkish color box shows the top level: the HL7 Processes and Tools Conceptual Model. The yellow boxes depict the main topics. If one topic has multiple areas or examples, these are shaded in green.

Figure 1. HL7 Processes and Tools Conceptual Model
4 HL7 Processes and Tools Conceptual Model

Walkthrough

This presents the walkthrough of the overall topic and the main topics only. The topics can be seen as self-explanatory. It starts at the Central Topic (top level) and then addresses the Main Topics.

4.1 HL7 Processes and Tools Conceptual Model

The core of the model represents the “HL7 Processes and Tools Conceptual Model” as the Central Topic. The tools are placed in the context of supporting HL7 work that is carried out by the workgroups, by HL7 staff, and to some extent by HL7 standards implementers. The tools are there to help the organization carry out the various tasks. The tasks are outlined through the main topics discussed in the next set of descriptions and identify by whom.

4.2 HL7 Processes

The first Main Topic addressed is the “HL7 Processes” that has as source the Central Topic HL7 Processes and Tools Conceptual Model and has as targets the following Topics: Meeting Processes, Publication Processes, HQ Processes, Accreditation Processes, Balloting Processes, Harmonization Processes. The identification of the various processes is helpful because some will use different tools than others. This assists in classifying tools on their fitness for purpose within HL7 International.

4.3 HL7 Tools

The Main Topic “Tools” has also as source the Central Topic HL7 Processes and Tools Conceptual Model and has as targets a series of Topics such as Automate Processes, Functional Areas, Details in the Catalogue, and Navigating Catalogue. The latter both point at the inventory itself and using the provided navigation features to find specific tools. This classifies tools according to type, and via the details also per subtype.

4.4 Organization

This Main Topic “Organization” stands for HL7 International, with its affiliates, the board, steering divisions and workgroups, but also the professional staff, all the events, newsletters, and the general website content.

4.5 Membership

The Main Topic “Membership” represents the thousands of members worldwide either of HL7 International itself, or through the affiliate construction. The members carry out many of the processes and depend on the series of tools in order to be able to do the work. The majority of members are either individual volunteers or organizational volunteers.

4.6 Workgroup Administration

The “Workgroup Administration” Main Topic is about the aspects of work necessary to maintain workgroups and support workgroup operations. Workgroup operational support includes creating and tracking minutes and agendas of meetings, scheduling and communicating how and when meetings will occur, establishing and tracking the projects that the workgroup is undertaking, tracking and managing the materials that support the project work and providing the means for workgroups to communicate with the members participating in the group activities and discussions.
4.7 Registry
The Main Topic "Registry" has as source the Central Topic HL7 Processes and Tools Conceptual Model and has as targets a series of Topics that point to the accessibility of the standards artifacts. The standards artifacts, such as the HL7 Reference Information Model, v2, CDA, v3, EHR and FHIR standards, among others, must be findable for the membership and for implementers. For that reason, these have an explicit role in the Tool Inventory and hence in this model.

The Registry links to various Topics, including V2 artifacts and guides, Clinical Document Architecture (CDA) artifacts and guides, V3 artifacts and guides, Domain Analysis Models (DAM), Electronic Health Record-System Functional Model / Functional Profiles and Personal Health Record-System Functional Model / Functional Profiles (EHR-S FM/FP & PHR-S FM/FP), Clinical Information Modeling Initiative (CIMI) models / Detailed Clinical Models, Fast Healthcare Interoperability Resources (FHIR) resources, extensions, Implementation Guides (IG), and value sets. Of course this listing is not complete, but it helps to identify which registry artifacts can help with specific HL7 standards. And this can be used to identify the need for specific tools to generate or implement the artifacts in the registry.

4.8 Standards Development
The reason for HL7 International to exist is to create standards. However, the standards creation process normally takes years and is based mostly on volunteer effort. At times, the work is funded through specific projects. The creation of a standards is highly detailed technical work that requires dedicated tools to ensure acceptable levels of quality in the finished and published products.

4.9 Standards Balloting
The results of the standards development work are balloted throughout membership. Balloting requires a specific set of tools for publication, subscription to ballot, voting and submission of comments, and ballot reconciliation.

4.10 Standards Publication
To support both Standards Balloting and Standards Implementation the standards that have been created must be made available for both review and use. Standards Publication needs to produce the standards in the various forms that consumption of the text and supporting artifacts. Consumption by the audience for standards changes based on technology and Standards Publication must adapt to new technologies to continue to meet the needs of the community.

4.11 Standards Implementation
Once the HL7 standards become available, implementation can begin. The community of implementers and health care organizations and vendors implementing the standards need a whole set of tools to support implementation. Some of these tools are HL7 tools, where others are available via vendors or open source providers. The tool inventory specifically includes information useful to implement the standards.

4.12 Standards Maintenance
Various steps in standards maintenance apply. First is that all ballot reconciliation work leads to updated materials ready for publication. However, there is also attention required to move through the informative via (D)STU to normative ballot. A reasonable time before the validity of a specific standard expires, a systematic review is required to determine what must be done. Maintenance decisions typically include the following options: move to next level, reballot as is, based on user experiences
(e.g. from the HL7 webpage where experiences with (D)STU standards can be documented) handle change requests, create a PSS and start the work.

### 4.13 Conformance and Testing

A particular set of tools is required to allow conformance testing against a specific HL7 standard, and when the standard has been implemented, testing if the implementation aligns with stated criteria for interoperable exchanges.

### 4.14 Education

Finally, education about standards, HL7 as organization, specific HL7 standards and their tools is an important part of the HL7 processes and tooling.
5  HL7 Tools and Services High-Level Models

The HL7 Tooling and Services Catalogue provides key information on the aspects of individual tools and/or services. With the collection of this knowledge, it is also possible to start producing diagrams that illustrate the overall flow between the various components. This chapter will focus on two key areas: ‘Web Services’ that support membership, workgroup administration, standards development, standards balloting, and standards publication (Figure 2); and ‘Publication’ that produces the various products that are balloting and distributes (Figure 3).

5.1  HL7 Web Delivered Services

The first part illustrates briefly what key Web Services are used by HL7 International (Figure 2).

![Diagram](image)

Figure 2. Web Services of HL7 International

The above diagram (Figure 2) provides a visual overview of key HL7 Web Services and the inter-relationship between these items. GoMembers supplies the Authorization and Authentication (A&A) services for the core HL7.org services but the Wikis, GForge Services, Project Insight, and HelpDesk all have unique and separate A&A facilities. The Ballot D/B has a separate, off-line update facility that is used by HQ staff.
5.2 Publishing Processes

Another core activity of HL7 International is the publication of the various standards products. This is represented on a high level in Figure 3.

Figure 3. HL7 Standards Publication Processes.

The above diagram (Figure 3) outlines the four main publishing streams currently in operation at HL7 International. The un-labelled individuals shown on the diagrams are external volunteers who are critical (often because of steps manually performed by these individuals) to the process streams. From top to bottom, the four publishing streams described are:

- the HL7 V2 stream,
- the general document stream (which is also used for Clinical Document Architecture (CDA) Implementation Guides and Electronic Health Record – system Functional Model and Functional Profiles (EHR-S FM, EHR-S FP), Domain Analysis Models (DAM), and such, and also can be various file formats like an Enterprise Architect *.EAP file),
- the Version 3 specification stream (which includes other documents that use the version 3 publishing facilities)
the FHIR Publication stream (which includes the FHIR implementation guides and the FluentPath standard). The diagram does not describe how the publishing inputs are produced or what tools used to produce the publishing inputs.

Several HL7 standards do require specific vocabulary management processes. They are not depicted separately, but should be mentioned as part of the standards work.