TECHNICAL REPORT

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Health informatics — Health informatics profiling framework

Informatique de santé — Cadre de profil d'informatique de santé

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Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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ISO/TR 17119 was prepared by Technical Committee ISO/TC 215, *Health informatics*.

Introduction

The health informatics profiling framework (HIPF) is designed to bring order to the description of health informatics standards artefacts. A common means of description is necessary to facilitate the coordination, communication and comparability of health informatics standards across and between disciplines and jurisdictions. The HIPF is an approach and tool to describe the variety of artefacts within the domain of health informatics standards. It builds upon other key information frameworks. This Technical Report does not constrain or drive conformance across informatics standards or their development, but it provides a useful descriptive tool to describe existing and developing health informatics standards.

Health informatics — Health informatics profiling framework

1 Scope

1.1 General

This Technical Report provides a common description framework for health informatics standards artefacts. The aim of the health informatics profiling framework (HIPF) is to provide a consistent method for describing and classifying artefacts within the domain of health informatics standards.

The HIPF establishes common concepts and a vocabulary for describing the complex domain of various health informatics standards initiatives and their supporting artefacts. The use of the HIPF should promote the reuse of health informatics knowledge and improve the identification of opportunities for health informatics standards alignment, collaboration and coordination.

1.2 Purpose

The purpose of the HIPF is to facilitate shared descriptions and comparisons of health informatics standards. In particular, it is the aim of the HIPF to:

— provide the capability to comprehensively define and classify health informatics standards artefacts,

— facilitate the coordination, communication and comparability of health informatics standards through a common understanding of intended uses and content,

— help identify and coordinate health informatics standards development,

— provide a potential foundation for the development of a global health informatics standards knowledge base,

— promote health informatics standards integration and alignment within and between standards from different jurisdictions, and

— provide a framework to assist with the coordination of ISO/TC 215 work items both within the technical committee and with related initiatives from other sources.

1.3 Benefits

The potential benefits of the HIPF include:

— introduction of classification concepts and terminology for health informatics standards artefacts,

— enhancement of health informatics standards development coordination through the identification of potential duplication between standards initiatives, and

— enhancement of global understanding of health informatics standards in support of their knowledge management.

1.4 Target users

The target users of the HIPF include:

— health informatics standards developers, and

— users of health informatics standards.

2 Terms and definitions

For the purposes of this Technical Report, the following terms and definitions apply.

2.1
artefact
any model, document, or work product

2.2
compatibility
capability of a functional unit to meet the requirements of a specified interface without appreciable modification

[ENV 12443:1996]

2.3
concept
units of thought constituted through abstraction on the basis of properties common to a set of objects

[ENV 12443:1996]

2.4
context
related conditions and situations that provide a useful understanding and meaning of a subject

2.5
data
“raw” alphanumeric text, objects, and symbols defined without any context in such a way that by itself one cannot tell its correct meaning

2.6
framework
a structure for supporting or enclosing something else, often acting to partition something complex into simple components

2.7
granularity
the boundary where an object functions as a self-contained, stand-alone unit to support a common vision or goal

2.8
health informatics profiling framework
HIPF
an approach and tool to describe the variety of artefacts within the domain of health informatics standards

2.9
HIPF cell
the intersection of an HIPF perspective and an HIPF level of specificity that is defined within the context of the HIPF classification matrix

2.10
HIPF classification matrix
a structure that includes dimensions for health informatics standards artefacts, levels of specificity, and perspectives

2.11
HIPF perspective
a classification dimension for differentiating health informatics standards artefacts based on their viewpoints, intended purpose or focus

NOTE This dimension includes the perspectives of what, how, where, who, when and why, which are further described in 4.2.1.2.

2.12
HIPF specificity
a classification dimension for differentiating health informatics standards artefacts based on their level of abstraction with respect to implementation specifications

NOTE This dimension includes the conceptual, logical and physical levels, which are further described in 4.2.1.1.

2.13
information
data in context that enable interpretation with meaning and relevance

2.14
interface
the shared boundary between two functional units defined by various characteristics pertaining to the functions, physical interconnections, signal exchanges and other characteristics as appropriate

[ENV 12443:1996]

2.15
profile
a brief description, outline or overview

2.16
top-down
method or procedure that starts at the highest level of abstraction and proceeds towards the lowest level

[ENV 12443:1996]

3 Health informatics profiling framework — Overview

3.1 General

The HIPF provides the basis for a management tool to support the coordination of health informatics standards initiatives. It does this by providing an approach for the classification of health informatics standards artefacts. This approach is supported by an extensible architecture.

The HIPF is a descriptive tool. It includes a simple two-dimensional HIPF classification matrix that articulates the dimensions of specificity and perspective. Although a simple structure, the matrix is capable of reflecting complexity through multiple relationships between a standard artefact and the HIPF matrix components. These relationships may be used to provide a comprehensive and comparable description of health informatics standards.

Artefact profiles may be further enhanced through the use of optional HIPF attributes, in addition to the classification matrix.

This Technical Report describes a methodological approach for using the HIPF matrix to “profile” health informatics standards, and it also describes how these classifications may contribute to the evolution of a health informatics standards knowledge base. This approach includes the following processes:

— health informatics standards profiling, and

— framework evolution.

These processes are intended to support the goal of sharing knowledge about and supporting the comparison of health informatics standards artefacts.

3.2 What is the health informatics profiling framework?

The first component to be addressed is the concept of a “framework”. A framework is a structure for supporting or enclosing something else. The HIPF is such a structure.

One of the essential features of both frameworks and models is that they allow highly complex systems to become conceptually manageable. The difference between them is primarily in terms of comprehensiveness and approach. Models are mostly concerned with describing what is wanted or what is available, often in a visual manner. Frameworks are more commonly used to describe and structure enterprise architectures or other comprehensive domains.

In developing the classification matrix portion of the HIPF, Zachman's widely known Enterprise Architecture Framework was used as a starting point. The “domain” of the framework or, in Zachman's terms, the “Enterprise”, which this architectural framework is to support, is the domain of “health informatics”.

Frameworks have the following properties.

— They partition the universe of interest into manageable chunks.

— They are comprehensive yet simple.

— They are composed of two or more dimensions. Most frameworks have two core dimensions though multidimensional (e.g. cube) frameworks may also be used.

— One dimension is often contextual (e.g. concerned with a specific perspective). Often this is related to the user of the information (e.g. designer, database builder) or domain (e.g. party, recipient).

— One can create one’s own framework or use an existing one if an appropriate structure is available for the domain of interest.

The HIPF classification matrix partitions this domain in terms of the level of specificity and the perspective (or focus area) as a consistent and generic method for describing health informatics standards artefacts. The profile of an artefact may be further enhanced by additional attributers, such as approval status and other optional detail.

In the HIPF, a “profile” is a brief description (including a classification) of a health informatics standards artefact.

3.3 How to use the health informatics profiling framework

The HIPF provides classification guidelines so that a model or other standards artefact can be placed in one or more of the cells defined in the matrix. The matrix partitions the domain of health informatics into 18 separate sub-domains. The classification matrix can help avoid unnecessary problems or confusion as the cell placement indicates which artefacts are unlikely or likely candidates for comparison or integration. Those that are placed in or mapped to the same cell have at least the characteristics of the cells to provide some basis for comparison or collaboration.

The classification of a model or other standards artefact requires analysis of the model or standard against the rows and columns of the matrix. The matrix allows for the co-location of artefacts that have like characteristics. It does not ensure that these artefacts can or should be compared or aligned. Decisions regarding alignment would be a subsequent exercise. The framework subdivides the health informatics universe into more manageable conceptual "chunks". Most likely, transformations will need to be determined and scope alignment performed before comparisons of models within a cell can be conducted. As per set theory, meaningful comparisons may only be made within the intersection space of the two sets or models.

The framework will require updating and re-versioning. A versioning process will enable the ongoing "greening" of the framework and will continue to increase the validity and value for its using community.

It is important to note that the HIPF is not an end in itself. Determining the placement of standards artefacts in the framework is only the first step. Working within a primary cell or a closely aligned group of cells to achieve objectives, such as aligning or comparing design artefacts, is where the real benefits are derived.

The basic construct of the two-dimensional HIPF classification matrix including three rows of specificity and six columns of perspectives provides a means of identifying and classifying the content of a health informatics standards artefact. The intersection of these dimensions constitutes a framework cell. Artefact classification is complete when an artefact is placed in one or multiple framework cell(s).

This matrix is a special application of Zachman's "Enterprise Architecture Framework", but with different sets of rows based upon observations about the nature of the various domains of interest and specificity. Zachman uses perspectives of roles of people in the enterprise as criteria. During the development of this report, it was determined that "levels of specificity" was a more appropriate criterion than Zachman's criteria for the classification of artefacts of interest to the health informatics standards community.

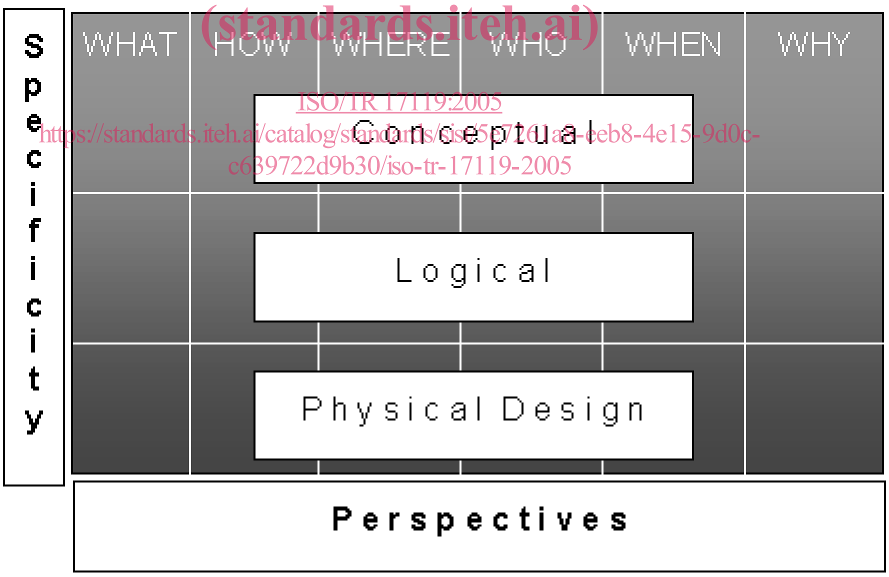

Figure 1 — Health informatics profiling framework classification matrix

Some of the background to the evolution of this framework has been provided in Annex A.

In addition, a proposed formalized approach to artefact definition and classification has been suggested and an example meta-model has been created to support artefact profiling and knowledge base development. This example meta-model, representing the inter-relationships between HIPF constructs, has been provided in Annex B.

4 Health informatics profiling framework approach

4.1 Overview of approach

The HIPF approach includes two processes: artefact profiling and framework evolution. Both of these processes should support the profiling of health informatics artefacts and the ongoing evolution of an HIPF knowledge base.

The artefact profiling process provides a brief description and common classification for health informatics standards and their artefacts. This process may be iterative, as additional knowledge on the definition and classification of an artefact may be attained at a later time. Profiled artefacts can be collected to form a knowledge base of health informatics artefacts.

Framework evolution should be a continuous process to ensure the proactive support of the artefact profiling requirements. The work products of framework evolution could be critical success factors for the artefact profiling process.

4.2 Artefact profiling

The artefact profiling process includes artefact classification, mapping assessment and artefact definition (with optional attributes).

This multi-step process is iterative. The definition of an artefact may change over time as more knowledge is gained about the artefact and as changes in the HIPF definition are made.

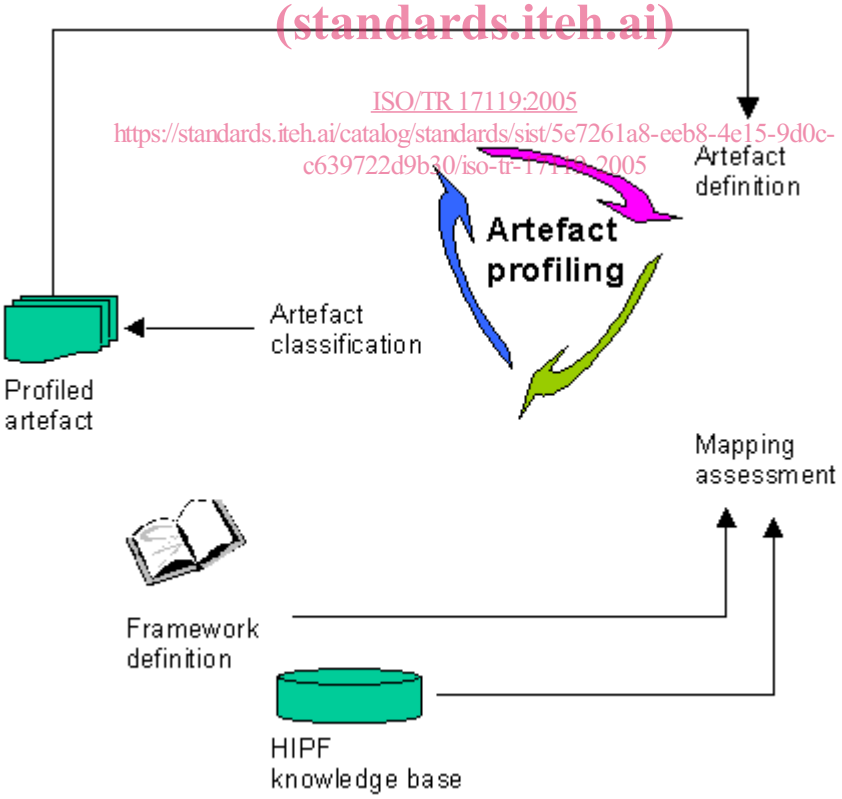

Figure 2 — Artefact profiling process