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**Health informatics — Workforce roles and capabilities for terminology and terminology services in healthcare (term workforce)**

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO ~~documents~~document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

~~Attention is drawn~~ISO draws attention to the possibility that ~~some of the~~ ~~elements~~implementation of this document may ~~be involve~~ the ~~subject~~use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of ~~any claimed~~ patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights. ~~Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).~~

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 215, *Health informatics*.

This first edition of ISO 22287 cancels and replaces ISO/TS 22287:2019, which has been technically revised.

The main changes are as follows:

- ~~Inclusion~~inclusion of FAIR principles and the importance of metadata;
- ~~Inclusion~~inclusion of implementation specialist as a terminology role.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

Countries that began the adoption of health information and communication technology (HICT) products have reported shortfalls in the quantity and skills of the workforce in health information technology (HIT), health information management (HIM), and health ~~informatics~~informatics (HI).

This document addresses workforce needs when implementing terminology resources (products) in healthcare organizations and related supporting organizations, including regional, national, and international HICT programs.

The purpose of this document is to enable healthcare organizations and related supporting organizations that deploy HICT products to safely and effectively support semantic interoperability within systems and between systems locally, nationally, or globally. Semantic interoperability, the ability of computer systems to exchange data with unambiguous and shared meaning, is impacted by the generation, management and sharing of health-related data and information.

Implementation and operation of complex terminologies in healthcare organizations and related supporting organizations without proper knowledge and skills of personnel in those terminological resources is a contributing factor in the resulting failure to deliver expected care outcomes, in delays in electronic health record (EHR) and health information systems (HIS) implementations, and in some cases, in injury caused to patients. Employers need to be able to hire workers with confidence that they have the right skill set for the job.

This document specifies tasks associated with electronic capture, management, sharing, and use of health record content in EHR and HIS in the context of clinical care, business processes, and information governance activities in healthcare.

This document is targeted to stakeholders involved in HICT products development, deployment, and use. Specific ~~value includes~~values include the following.

- ~~Healthcare organizations and HICT vendors~~: ~~Requirements~~requirements and guidance for tasks and the skills for human resource staff to guide hiring of terminology standards personnel.
- ~~Professional associations~~: ~~Guidance~~guidance for terminology skill requirements, training and certification of HIT, HIM, and Informatics professionals, as well as accreditation of terminology services programs.
- ~~Academia~~: ~~Guidance~~guidance for (a) the overall curricula development to support semantic interoperability education under HIT, HIM, and informatics programs, and (b) terminology competencies to support course development.
- ~~eHealth, HIM, HIT, Informatics professionals and others~~: ~~Provide~~provide a mechanism to consistently and accurately indicate career pathways and skill expectations.
- ~~Consumers (patients, clinicians, governments, society)~~: ~~Safesafe~~safe, quality information is available.

This document supports the deployment of semantic content standards developed by TC 215 in healthcare organizations and governmental entities involved in electronic information sharing using interoperable standards-based HICT products. It provides direction on workforce needs for deployment and operation of terminological resources as well as the roles, competencies and skills to support these needs. Consideration of a business case development and potential numbers needed (i.e. terminology workers) would also be helpful in determining workforce requirements.

It also supports the development of the TC 215 reference standards portfolio (an assembly of individual standards) for interoperable HICT solutions in specific health domains, by identifying specific content area(s) for which a qualified terminology services workforce is needed.

ISO 21298 also describes a number of roles in healthcare. It is possible that some staff with roles as described in this document undertake roles described in ISO ~~22287 roles might also undertake roles as described in ISO~~ 21298 ~~roles~~, or there ~~might~~can be naming collisions.

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# Health informatics — Workforce roles and capabilities for terminology and terminology services in healthcare (term workforce)

## 1 Scope

This document specifies the tasks, roles, and key skills, requirements and competencies for personnel involved in terminology services in healthcare organizations.

This document specifies:

- ~~terminology services in healthcare organizations including the selection, authoring, and deployment and use of terminology subsets, ~~datasets~~data sets and maps; developing and managing terminology management processes and health information management-related policies; performing terminology business analysis; and supporting the adoption, planning, and deployment of terminologies;~~
- ~~workforce needs to perform these services;~~
- ~~job roles in the healthcare organizations and related organizations responsible for performing terminology related tasks, ~~and~~;~~

NOTE Examples of these roles include terminologist, terminology standards developer/manager, mapping specialist, data conversion analyst, interface analyst, coding specialist, data developer/designer, data ~~modeler~~modeller, and content manager ~~(including Clinical Documentation Improvement ~~{(CDI)}~~ specialist)~~.

- ~~skill and competency level requirements to safely and effectively undertake each task, taking into account the focus of the task from the perspectives of ~~HICT~~health information and communication technology (HICT), information management, information governance including information privacy and security, clinical practice, and healthcare decision making.~~

## 2 Normative references

There are no normative references in this document. ISO/FDIS 22287  
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## 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ~~ISO Online browsing platform: available at <https://www.iso.org/obp>~~<https://www.iso.org/obp>
- ~~IEC Electropedia: available at <https://www.electropedia.org/>~~<http://www.electropedia.org/>

### 3.1

#### **adoption**

act of taking up or following something

### 3.2

#### **author**

entity or set of entities that create and ~~might~~can modify an asset

### 3.3

#### **classification**

terminology which aggregates data at a prescribed level of abstraction for a particular domain

### 3.4

#### **code system**

organized, managed collection of codes, each of which has associated designations, meanings and in some cases relationships, properties or rules:

[SOURCE: ISO/TS 17117-2:2022(en), 3.2]

### 3.5

#### **code system extension**

set of *code system* (3.4) components and derivatives that add to and are dependent on a published code system

### 3.6

#### **competency**

knowledge, *skills* (3.18), abilities, and behaviours of an individual to perform a job properly

### 3.7

#### **conformity**

#### **conformance**

fulfilment of specified requirements

### 3.8

#### **data set**

identifiable collection of data available for access or download in one or more formats

[SOURCE: ISO/IEC 11179-33:2023]

Note 1 to entry: A data set can be a smaller grouping of data which, though limited by some constraint such as spatial extent or feature type, is located physically within a larger data set. Theoretically, a data set can be as small as a single feature or feature attribute contained within a larger data set.

Note 2 to entry: A data set can be presented in a tabular form and stored and distributed in tables in word processed documents, spread sheets or databases. It ~~could~~can also be presented in ~~any one of~~ a number of alternative formats, including AVRO, JSON, RDF and XML.

Note 3 to entry: A data set can include attributes to facilitate *adoption* (3.1) and maintenance and it can contain maps to a Reference Terminology. Therefore, it should not ~~to~~ be confused with a *subset* (3.20) or a *value set* (3.23).

[SOURCE: ISO/IEC 11179-33:2023, 3.5, modified — Note 3 to entry was added.]

### 3.9

#### **interface terminology**

a collection of commonly used terms to support user entry of health information into computer clinical applications

### 3.10

#### **information management**

planning, collection, control, distribution and exploitation of information resources within an organization, including systems development, and disposal or long-term preservation

[SOURCE: ISO 5127:2017, 3.2.1.23, modified — Note 1 to entry has been removed.]

**3.11**

**information governance**

processes by which an organization obtains assurance that the risks to its information, and thereby the operational capabilities and integrity of the organization, are effectively identified and managed

**3.12**

**information privacy**

rights and obligations of individuals and organizations with respect to the collection, use, retention, disclosure and disposal of personal information

[SOURCE: ISO/TS 14441:2013, 3.26]

**3.13**

**information technology**

resources (especially computers and telecommunication) used to acquire, process, store, and disseminate information

[SOURCE: ISO/IEC 38500:2015, 2.12], modified — "(especially computers and telecommunications)" was added to the definition; the Note 1 to entry was removed.

**3.14**

**mapping**

process of defining a relationship between concepts in one coding system to concepts in another coding system in accordance with a documented rationale, for a given purpose

**3.15**

**safety**

freedom from unacceptable risk

**3.16**

**security**

combination of confidentiality, integrity, and availability

**3.17**

**semantic interoperability**

ability of computer systems supporting health care practice and management to correctly and consistently interpret the information being exchanged

**3.18**

**skill**

ability to perform a task or activity with a specific intended outcome acquired through education, training, experience or other means

[SOURCE: ISO/IEC/TS 17027:2014, 2.74]

**3.19**

**standards development organization**

organization one of whose functions is to create and/or publish standards

[SOURCE: ISO/TS 27790:2009, 3.70]

**3.20  
subset  
code set**

a list of coded concepts that meet a specific need

Note 1 to entry: A subset can be used for data entry or health system use extract. The concepts can ~~or cannot~~ be drawn ~~or not~~ from a *code system* [\(3.4\)](#).

**3.221  
terminology service**

service that ~~lets~~allows healthcare applications ~~to~~ make use of codes and *value sets* [\(3.23\)](#) ~~(3.23)~~ without having to become experts in the fine details of *code system* [\(3.4\)](#), value set and concept map resources, and the underlying code systems and terminological principles

**3.232  
terminology standards certification**

general accomplishments, *competencies* [\(3.6\)](#) ~~competences~~ or *skills* [\(3.18\)](#) that fulfil the requirements as outlined in a terminology standards' program

**3.242  
value set**

identifiable set of coded values associated with a data element that consists of concept representations drawn from one or more *code system* [\(3.4\)](#)

~~[Leveraged from HL7]~~

Note 1 to entry—: a value set is not the same as a value domain as defined in ISO/IEC 11179-1:2023.

Note 2 to entry—: In HL7 value sets are all uniquely identified.

~~[SOURCE: Leveraged from HL7]~~

**3.252  
workforce**

people who provide a service or labour to contribute to business or organizational outcomes

~~[SOURCE: ISO 30400:2016, 102022, 3.8.1]~~

## 4 Abbreviations

CDA	Clinical Document Architecture
CDI	Clinical Documentation Improvement
CPT	Current Procedural Terminology
CT	Controlled Terminology
DICOM	Digital Imaging and Communications in Medicine
EHIS	Electronic Health Information Systems
EHR	Electronic Health Record
FAIR	Findable Accessible Interoperable Reusable
FHIR	Fast Healthcare Interoperability Resources
HI	Health Informatics