BS ISO 22287:2024

BSI Standards Publication

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

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National foreword

This British Standard is the UK implementation of ISO 22287:2024. It supersedes PD ISO/TS 22287:2019, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee IST/35, Health informatics.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Informatique de santé — Rôles et capacités des effectifs en charge de la terminologie et des services de terminologie dans le domaine de la santé (effectif à durée déterminée)

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Foreword

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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 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).

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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 of FAIR principles and the importance of metadata;

— inclusion of implementation specialist as a terminology role.

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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 (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 values include the following.

— Healthcare organizations and HICT vendors: requirements and guidance for tasks and the skills for human resource staff to guide hiring of terminology standards personnel.

— Professional associations: guidance for terminology skill requirements, training and certification of HIT, HIM and Informatics professionals, as well as accreditation of terminology services programs.

— Academia: 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 a mechanism to consistently and accurately indicate career pathways and skill expectations.

— Consumers (patients, clinicians, governments, society): 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 described in this document undertake roles described in ISO 21298, or there 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, 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;

NOTE Examples of these roles include terminologist, terminology standards developer/manager, mapping specialist, data conversion analyst, interface analyst, coding specialist, data developer/designer, data 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 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.

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

— IEC Electropedia: available at https://www.electropedia.org/

3.1
adoption
act of taking up or following something

3.2
author
entity or set of entities that create and can modify an asset

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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, 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

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 can also be presented in 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 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

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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 be drawn or not from a *code system* (3.4).

3.21
terminology service
service that allows healthcare applications to make use of codes and *value sets* (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

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3.22
terminology standards certification
general accomplishments, *competencies* (3.6) or *skills* (3.18) that fulfil the requirements as outlined in a terminology standards' program

3.23
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)

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]

3.24
workforce
people who provide a service or labour to contribute to business or organizational outcomes

[SOURCE: ISO 30400:2022, 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
HIM	Health Information Management
HICT	Health Information and Communication Technology
HIT	Health Information Technology
HL7	Health Level Seven
ICD	International Classification of Diseases
IHE	Integrating the Healthcare Enterprise
LOINC	Logical Observation Identifiers Names and Codes
SDO	Standards Development Organization
SNOMED	SNOMED International

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SNOMED CT Systematized Nomenclature of Medicine Clinical Terms

WHO World Health Organization

5 Terminology and terminology services in healthcare

The use of clinical terminologies, such as SNOMED CT and LOINC, has been increasing as part of the growing investments in health information technologies. There is a business need in health care organizations to establish services to support the implementation and maintenance of e-health solutions including electronic capture, management, sharing and use of health record content in the context of clinical care, business processes and information governance activities. The following "terminology" roles, activities and products have been identified as in demand or anticipated to be in demand in healthcare organizations.

— Terminology subsets and data sets: creating, maintaining, extending, quality assurance, and distributing and/or publishing subsets or data sets and supporting derivatives.

— Terminology maps: creating, maintaining, extending, quality assurance, and distributing and/or publishing maps and supporting material.

— Terminology management processes/policies: developing, managing and updating health information management-related policies and processes to manage terminologies, including how to create subsets and terminology maps, how to maintain terminologies and requests for change, how to engage clinical experts for validation and overall decision-making processes related to terminology management.

— Terminology business analysis: gathering terminology requirements and defining terminology needs for e-health solutions and/or other tools (e.g. terminology tools, tools to support health analytics), development of recommendations for adopting, adapting or developing terminologies to meet specific business needs, supporting the definition of functional requirements, evaluating requirements as part of a procurement process, documenting workflow, providing terminology guidance to support configuration as required, support deployment of solutions from a terminology perspective (e.g. development of training manuals, development of test scenarios, testing).

— Implementation planning and deployment of terminologies: supporting implementation planning and deployment of terminologies within an organization, region, or jurisdiction as part of an overall strategic plan or solution deployment including communication, education, change management, etc.

— Data retrieval and analysis: utilizing terminologies for effective meaning-based retrieval to support epidemiology, research, evidence gathering and service planning (clinical and administrative), and ensuring the organization is using health information standards appropriately and effectively.

— Decision support protocols, guidelines and other knowledge resources: providing guidance from a health information management perspective on how to integrate terminologies into these resources (e.g. policy requirements, patient care outcome improvements).

— Research of clinical terms and definitions: providing an understanding of clinical terms and how context plays a role in selecting the correct concept or term for the right usage or setting.

Healthcare organizations and supporting organizations need a trained and experienced workforce to support terminology activities.

6 Healthcare terminology professionals

6.1 Workforce shortage and impact

Healthcare terminology professionals are those members of the workforce who are involved in the tasks associated with the terminology services described in Clause 5. Countries that have begun HICT adoption have reported shortfalls in the quantity and skills of the workforce in health information technology, health information management and health informatics. Specific examples of countries' workforce needs are presented in Annex A.

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Annex A indicates the impact of human resource competencies and skills on the adoption of HICT technologies and investments in HICT. Workforce impacts have been identified as the following two key demand drivers in various countries:

a) the "employment effect" – increases the number of professionals required;

b) the "skill-broadening effect" – many professionals require additional training or experience to meet terminology services demands.

The occupational group of terminology specialist was specifically identified as needing to grow in number and also requiring broader skills.[27] Organizations such as SNOMED International have begun investing in developing educational materials to promote the effective deployment and use of its product – SNOMED CT.

6.2 Terminology specialists: roles, job and skills requirements, and qualifications

6.2.1 General

Annex B provides the list of specific roles related to terminology and terminology services in healthcare organizations and related supporting organizations. These include, but are not limited to:

— terminology implementation specialist;

— terminology author;

— terminology standards developer/manager;

— mapping specialist;

— data conversion analyst;

— user interface analyst;

— coding specialist;

— data developer/designer;

— data modeller;

— content manager (including clinical documentation improvement specialist).

These various roles can be consolidated under the three levels of specialists performing terminology services:

Level 1 – Terminology technical specialist;

Level 2 – Terminology specialist;

Level 3 – Terminology advanced specialist.

The roles, job requirements, terminology skill requirements, general skills and qualifications for each level are described in 6.2.2, 6.2.3 and 6.2.4. Specific tasks under these roles shall take into account the focus of the task from the perspective of HICT, information management, information governance (including information privacy and security), clinical practice and healthcare decision making.

6.2.2 Terminology technical specialist

6.2.2.1 Role

The terminology technical specialist is responsible for the technical and/or tooling aspects of terminology development, mapping, terminology analytics, maintenance and implementation. The terminology technical specialist will work in a team setting with clinicians, project teams, operational teams, business analysts, mapping specialists and terminology specialists providing knowledge transfer to clients and team members,

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