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Health informatics — Standardizing graphical content

ISO/TC 215

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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*.

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.

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Introduction

Images and graphics predate any formal written human communication. Cave paintings and engravings have given pointers to lifestyles and methods from ancient times. Pictograms describing health problems have been found as engravings and drawings in the Egyptian pyramids (approximately 2 500 BC), the frescoes and road signs in Pompei (approximately 1st century AD) and the murals in the ancient temples of India such as Konark Sun Temple (1 250 AD). They have helped retrace the history of medicine and given an idea of health problems existing in those times. More importantly, their usage transcended language barriers.

Healthcare needs are universal. The health information technology sector depends on accurate and consistent transfer of information relevant to the health care providers and their patients. The focus is on finding convenient and universally understood methods for information transfer. In this context, graphics usage in the form of emojis, emoticons and stickers has become an indispensable tool in enhancing online communications and making it richer and more emotive. Healthcare applications are also adopting graphics, but their usage is still less prevalent than in other fields. One of the major reasons behind this is the lack of standardization in this field. This document attempts to stimulate interest, emphasize the need, and suggest ways for better usage of graphics in healthcare information technology.

With rising life expectancy, along with higher incidence of non-communicable diseases (NCDs), there is a constant need for care support. Advances in telecommunication have allowed this to be offered remotely through telehealth systems. Even before the COVID period, 76 % of US citizens preferred remote care over a physical visit^[19].

Telehealth has spurred the need for interoperability standards. Telehealth usage increased exponentially globally following the COVID pandemic. With global warming and related environmental issues, the frequency of other natural disasters has increased. During disasters, the need for remote support increases the interchange of health-related communication, even among communities and people who have never met before. Improved travel facilities have given rise to tourism, and especially medical tourism. Migration is also a rising phenomenon. Both medical tourism and migration increase the possibility of language and cultural differences between the care provider and the patient. Thus, methods to easily transfer health information across platforms and language barriers can help achieve consistent and uniform delivery of care.

Graphics and visually relatable content, for example locating injuries or pain with additional on-the-spot markings, have been long used for medical record keeping. However, these are not yet standardized.

This document extrapolates the need and current status of health-related graphics standardization.

Likely beneficiaries of this document include:

- application developers;
- telehealth solution providers;
- those working in the social media workspace;
- those working with terminologies;
- clinicians and other users of applications;
- informaticians, analysts and researchers working in the field of health information.

Health informatics — Standardizing graphical content

1 Scope

This document describes the need for standardization of graphics and images in the health informatics domain. It focuses on the current status of adoption and presents an overview of the opportunities as well as challenges in creating sets of standardized images and graphics. A plan of action is proposed to serve as the future roadmap for implementation.

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 terminology 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 General terms

3.1.1

assessment in ankylosing spondylitis

ASAS

method to calculate *disease activity score* (3.1.3) for ankylosing spondylitis and related disorders

3.1.2

botox

botulinum toxin

product used in cosmetic surgery to erase fine wrinkles in the skin

Note 1 to entry: Botox is also used to release spasm for certain neurological conditions.

3.1.3

disease activity score

DAS

method to assess the disease activity

Note 1 to entry: DAS is commonly used for rheumatological disorders assessing specific problems in a few named joints. In rheumatoid arthritis, 28 joints are assessed (DAS28), for SSA, the number of joints can be 44 (DAS44) or even higher (DAS 66/68).

3.1.4

laser

light amplification by simulated emission of radiation

treatment used in cosmetic surgery for scars, pigmented lesions, and hair removal

3.1.5

lexicon

complete set of meaningful units in a language

3.1.6

medical device

instrument, apparatus, implement, machine, appliance, implant, reagent for in vitro use, software, material or other similar or related article, intended by the manufacturer to be used, alone or in combination, for human beings, for one or more of the specific medical purpose(s) of:

- diagnosis, prevention, monitoring, treatment or alleviation of disease;
- diagnosis, monitoring, treatment, alleviation of, or compensation for an injury;
- investigation, replacement, modification or support of the anatomy, or of a physiological process;
- supporting or sustaining life;
- control of conception;
- cleaning, disinfection, or sterilization of medical devices;
- providing information by means of *in vitro* examination of specimens derived from the human body;

and that does not achieve its primary intended action by pharmacological, immunological or metabolic means, in or on the human body, but which can be assisted in its intended function by such means

[SOURCE: Essential Principles of Safety and Performance of Medical Devices and IVD Medical Devices^[23]]

3.1.7

post-coordination

technique used in *SNOMED CT* (3.1.9) to combine clinical *concepts* (3.2.1) to ontologically define more complex concepts

3.1.8

pre-coordinated expressions

expressions that represent the meaning of individual *concepts* (3.2.1) which are predefined in *SNOMED CT* (3.1.9)

3.1.9

SNOMED CT

Systemic NOMenclature in MEDicine Clinical Terms 6231

systematically organized computer processable collection of medical terms providing codes, terms, synonyms, and more, managed by SNOMED International

3.1.10

terminology

set of designations and *concepts* (3.2.1) belonging to one domain or subject

[SOURCE: ISO 1087:2019, 3.1.11]

3.1.11

training data set

data set of examples used during the learning process and used to fit the parameters

3.1.12

typeahead

method wherein a keyboard entry of the first few letters suggests the most likely word or phrase which will complete the text

3.2 Terms related to information management

3.2.1

concept

unit of knowledge created by a unique combination of characteristics

Note 1 to entry: *SNOMED CT* (3.1.9) concept codes are numerical codes that identify clinical terms, primitive or defined, organized in hierarchies.

[SOURCE: ISO 1087:2019, 3.2.7, modified — Notes to entry were removed; a new Note 1 to entry was added.]

3.2.2

coding scheme

collection of rules that maps the elements of one set on to the elements of a second set

[SOURCE: ISO/TS 21089:2018, 3.33]

3.2.3

data

information elements which are input, stored, processed or output by the automated information system which supports the clinical and business functions of a *healthcare* (3.3.1) organization

Note 1 to entry: These data can relate to person identifiable records or be part of an administrative system where persons are not identified.

[SOURCE: ISO/TS 21089:2018, 3.43]

3.2.4

electronic health record

EHR

health record (3.2.7) where all information is stored on electronic media

[SOURCE: ISO 13606-1:2019, 3.3.13]

3.2.5

electronic medical record

EMR

electronic record derived from a computerized system used primarily for delivering patient care in a clinical setting

[SOURCE: ISO/TR 24291:2021, 3.3]

3.2.6

health information

information about a person relevant to his or her health

[SOURCE: ISO 18308:2011, 3.28]

3.2.7

health record

data (3.2.3) repository regarding the health and *healthcare* (3.3.1) of a subject of care

Note 1 to entry: The term *electronic health record* (3.2.4) may be used for a health record where all *information* is stored on electronic media.

Note 2 to entry: A *health record* may include, for example, medical records, dental records, social care records.

[SOURCE: ISO 13606-1:2019, 3.3.11]

3.3 Terms related to healthcare

3.3.1

healthcare

care, services or supplies related to the health of an individual

Note 1 to entry: Includes any: a) preventative, diagnostic, therapeutic, rehabilitative, maintenance, or palliative care, counselling, service, or procedure with respect to the physical or mental condition, or functional status, of a patient or affecting the structure or function of the body; b) sale or dispensing of a drug, device, equipment, or other item pursuant to a prescription; or c) procurement or banking of blood, sperm, organs, or any other tissue for administration to patients.

[SOURCE: ISO 13940:2015, 3.1.1, modified — Original note to entry was removed; a new Note 1 to entry was added.]

3.3.2

home healthcare

healthcare (3.3.1) provided in a dwelling place in which a care recipient lives or other places where care recipients are present, excluding professional healthcare facility environments where operators with medical training are continually available when care recipients are present

Note 1 to entry: Professional healthcare facilities include hospitals, physician offices, freestanding surgical centres, dental office, freestanding birthing centres, limited care facilities, first aid rooms or rescue rooms, multiple treatment facilities and emergency medical services.

Note 2 to entry: For the purpose of this document, nursing homes are considered dwelling places for home healthcare.

Note 3 to entry: Other places where a care recipient is present include the outdoor environments while working and in vehicles.

[SOURCE: ISO/TR 25555:2024, 3.4]

3.3.3

telehealth

healthcare (3.3.1) activity supported at a distance by information and communication technology service(s)

Note 1 to entry: It is possible that the subject of care is not directly involved in a telehealth service, e.g. in the case of tele-dermatology where one physician consults another physician who is at a distant location.

Note 2 to entry: Healthcare activities may include healthcare provider activities such as diagnosis, treatment, review or advice, and self-care activities as prescribed or recommended by a health professional, preventive (educational) advice and management of healthcare processes.

Note 3 to entry: Healthcare activities may include both synchronous (real-time) and asynchronous (delayed) interactions between actors. For example, a radiology examination can be transmitted and subsequently reported by a radiologist over a communications network. A discussion on the diagnostic findings can occur in real time over a telephone or video conferencing connection between a patient and health professionals.

[SOURCE: ISO 13131:2021, 3.5.2, modified — The preferred term “telehealth service” was changed to “telehealth”.]

3.4 Terms related to graphical information

3.4.1

description

normative text which defines the purpose, the application and the use of the graphical symbol, and optional product area

3.4.2

dragging

dragging and dropping

moving one (or more) object(s) on a display by translating it (them) along a path determined by a pointer

[SOURCE: ISO 9241-400:2007, 3.9.1]

3.4.3

frame

enclosing border or the matter or area enclosed in such a border, such as a picture

3.4.4

icon

digitized [*pixelated* (3.4.7)] representation of a graphical symbol, usually used on a reconfigurable electronic display screen or graphical user interface (GUI)

Note 1 to entry: A single symbol can be represented by multiple icons, each of a different size, pixel count or colour.