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STANDARD FOR THE EXCHANGE, MANAGEMENT AND INTEGRATION OF ELECTRONIC MEDICAL INFORMATION,HEALTH LEVEL 7

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Annotation
The article discusses the international standard for document management in medical systems.

Keywords : standard, HL7 , medical systems, information.

Аннотация
В статье рассматривается международный стандарт документооброта в медицинских системах.

Ключевые слова:стандарт, HL7, медицинские системы, информация.

Introduction

Efficient data exchange between medical institutions allows you to quickly and more efficiently provide medical services to the population. It also increases understanding between medical institutions, doctors and the common man.

Over the past 40 years, many e-medicine standards have been developed. One of them Health Level 7 (HL7) is a standard for the exchange, management and integration of electronic health information.

HL7 provides a set of flexible standards, guidelines, and methodologies by which different medical systems can exchange information among themselves. Such directives or standards are a set of rules that allow the dissemination and processing of information in a uniform manner. These standards are designed to allow healthcare organizations to easily share clinical information.

HL7 includes concept standards (HL7 RIM), document standards (HL7 CDA), application standards (HL7 CCOW), and messaging standards (HL7 v2.x and v3.0). The latter are of particular importance, since they determine how to transfer information between participants.

Reference information Model (RIM), reference information model. The main source of data content for all messages and documents.

RIM consists of several technologies:

- USAM—general housekeeping model. An object model for any possible action in the system;
- MIM—message models;
- R-MIM - context-bound model.

Clinical document Architecture (With DA) - Architecture of the Clinical document. The standard fully describes the encoding, structure and semantics of clinical documents. CDA is based on the XML language. When creating a clinical document, its markup, structure, and semantics are taken from the CDA description. The specification itself is derived from the RIM data guide. The CDA Clinical Document is a complete information object, with fully defined components. Additionally, it may contain text, images, sound, and other multimedia content.

Messages V2.HL7 Version 2 defines a sequence of electronic messages to support both administrative and financial as well as clinical processes. The standard maintains backward compatibility. Uses delimiter-based text encoding.

Messages V3.

The HL7 message standard version 3 defines a series of electronic messages to support all workflows. The standard is based on the XML encoding system.

The HL7 standard is not an alternative to the DICOM protocol. The standard is based on the Open model Systems Interconnect (OSI). The structure of the DICOM standard follows the directives of the ISO/IEC organizations governing the form of draft international standards, which significantly differs from the HL7 standard. The standard presents medical information in a unified form without the development of additional programs and interfaces. In doing so, it standardizes the exchange of information rather than systems for data transmission. Therefore, there is a variety of methods for applying the HL7 standard in various medical institutions. The standard supports the exchange of information between systems operating on a very wide range of technical means. Its implementation is practical enough for a wide range of programming languages and operating systems. It also supports communications across a variety of telecommunications environments, from fully compatible with the 7-layer OSI protocol stack, to primitive " point-to-point " connections and the transmission of data packets on external media. Now the standard successfully works with simple " direct " type connections, and modern TCP/IP, DECNET, SNA, understands Microsoft , Unix , IBM SUN control codes.Immediate transfer of simple transactions should be supported along with transfer of files consisting of multiple transactions. The standard includes the possibility of local variations.

The standard is quite scalable as requirements arise. Also includes the process of adding extensions and upgrading to new versions in existing operating environments.

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The standard is defined for the "client-server" model, but it can also be safely attributed to file exchange. One or more messages can be processed in accordance with the encoding rules, grouped into a file and transmitted on external storage media using the FTAM, FTP and other protocols.Message formats consist of data fields of variable length, separated by a field separator character, according to the encoding rules of the standard. The rules describe how different types of data are encoded in a field and in which case the field can be repeated . Fields of data are combined into logical groups, creating segments. Each segment begins with a three-letter identifier identifying its destination in the message. Segments are defined as required or optional. Data fields are identified in the message by their position within their respective segments. All data is presented as ASCII table characters. Encoding rules define field values.

The main goal of HL7 defines several objectives:

• Support for the interaction of systems implemented in a variety of technical environments, ie. hardware and platform independent . Also maintaining communication for various systems and communication environments;

• direct transmission of single messages should be provided along with transmissions of multiple message sets;

• defining the format of specific data structures;

• support for scalability in accordance with emerging requirements.

• The standard is based on the experience of existing industrial and medical protocols.

• The standard prevents additional development of the data model and special protocols for the interaction of medical information systems in each individual case.

The table shows a comparison of the HL7 standard and the least known DICOM standard

Comparison table of HL7 standard with DICOM

Function	HL7	DICOM
Hospital information system	+	+
Radiology Information	+	+
storage and sharing system	+	+
Graphic Diagnosis	+	+
Archiving	+	+
Image in documentation	+	+
Interim reports	+	-
Video to Documentation	+	-
Electronic card	+	+
Create invoices	+	-
Data conversion	+	-

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