

What is Interoperability?

I. Preamble

The Alliance and its membership recognize a need for healthcare information technology (HIT) interoperability in order to improve the quality of healthcare and reduce the cost of its delivery. In order to clarify the concept, the Alliance is proposing a definition of interoperability for use in policy and legal contexts.

The definition should convey a practical understanding of what it means for HIT systems to be interoperable. From a policy perspective, a definition of interoperability is useful so that lawmakers and other policy-making officials can have a consistent working definition to use in their deliberations. From a legal perspective, the definition can help guide discussions about whether any particular product is legally and contractually interoperable. The definition is *not* a technical specification for interoperability. Rather, it will serve as the guiding principle for development of such specifications.

II. Interoperability

A. Definition

In healthcare, *interoperability* is the ability of different information technology systems and software applications to communicate, to exchange data accurately, effectively, and consistently, and to use the information that has been exchanged.¹

B. Levels

The Center for Information Technology Leadership described four different categories (“levels”) of data structuring at which health care data exchange can take place.² While it can be achieved at any level, each has different technical requirements and offers different potential for benefits realization.

The four levels are:

Level 1: Non-electronic data. Examples include paper, mail, and phone call.

Level 2: Machine transportable data. Examples include fax, email, and unindexed documents.

Level 3: Machine organizable data (structured messages, unstructured content).

Examples include HL7 messages and indexed (labeled) documents, images, and objects.

Level 4: Machine interpretable data (structured messages, standardized content).

Examples include the automated transfer from an external lab of coded results into a provider’s EHR. Data can be transmitted (or accessed without transmission) by HIT systems without need for further semantic interpretation or translation.

¹ Adapted from the IEEE definition of interoperability, and legal definitions used by the FCC (47 CFR 51.3), in statutes regarding copyright protection (17 USC 1201), and e-government services (44 USC 3601).

² Walker J, Pan E, Johnston D, Adler-Milstein J, Bates D, Middleton B. The Value Of Health Care Information Exchange And Interoperability. *Health Affairs*. Web Exclusive, January 19, 2005.

A continuum of value exists with interoperability: every increase in level sees a corresponding increase in realized benefits. This occurs because significant quality and efficiency benefits can be realized when computers can “understand” the meaning of exchanged data and can suggest safe and efficient practices. At Level 3 and lower interoperability, the data can be used by humans, but for the most part cannot be used by machines for automated decision support, active guidance, and pattern analysis. As a result, opportunities for error and cost reduction based on computerized suggestions are substantially less.

III. Relationship to Standards

A standard is an agreement among parties within an area of technology. The agreement can range from the abstract, such as a uniform methodology, to something more tangible, like coded terminology or physical specification of technological components. In HIT, standards are relied on for data transmission, medical terminology, and other purposes.

Interoperability is the result of an agreement between or among systems to share information. That agreement includes not only what information is to be shared, but also what standard(s) will be used to accomplish this sharing.

In the early stages of interoperability implementation, it is unlikely that any single system will be completely interoperable with every other system at Level 4. But there will be an incremental movement toward this as interoperability of various data types becomes more commonplace in systems through increasing use of agreed-upon standards. Initial efforts at achieving eventual Level 4 interoperability should be focused on the clinical data types that, generally, are already stored in a coded and structured format, and that would yield the highest clinical value if made interoperable. Examples of these data types are laboratory results, medications, allergies, problems, procedures, etc.

Because they will supply the framework on which interoperability will develop, standards must in every case be open standards, i.e., in the public domain and non-proprietary. Examples of such open standards include IEEE, HL-7, and SNOMED standards.

IV. Summary

While not a panacea, it is hoped that this definition will help standardize the discussion of interoperability and thereby further its progress. The Alliance next hopes to gain input from outside organizations in order to establish an industry-wide consensus definition.

Alliance Interoperability Definition Endorsers

American Academy of Family Physicians
American College of Physicians*
American Hospital Association
American Health Information Management Association
American Medical Association
American Medical Group Association
American Medical Informatics Association
American Organization of Nurse Executives
Blue Cross Blue Shield Association
Blue Cross Blue Shield of Tennessee
BearingPoint, Inc.
Catholic Health Initiatives
Cedars-Sinai Health System
Center for Information Technology Leadership
Cisco Systems, Inc.
CSC Global Health Solution
Eclipsys Corporation
First Consulting Group
Federation of American Hospitals
Global Healthcare Exchange, LLC
General Motors
HealthAlliant
HealthTech
Hospira
Hospital & HealthSystem Association of Pennsylvania
Ingenix
Inland Northwest Health Services
INTEGRIS Health
Joint Commission on Accreditation of Healthcare Organizations
Johnson & Johnson Health Care Systems, Inc.
Memorial Hermann Healthcare System
MercuryMD, Inc.
Nebraska Hospital Association
Missouri Hospital Association
New York-Presbyterian Hospital and Healthcare System
Neoforma
Northwestern Memorial Hospital
Norton Healthcare
Oracle
Partners HealthCare System, Inc.
RxHub
Sutter Health
Tennessee Hospital Association
University Hospitals Health System
VisionShare
William Beaumont Hospital

*The American College of Physicians supports the definition.