Gartner

Research

Publication Date: 7 March 2005

ID Number: G00124850

Two Versions of Continuity of Care Record Offer Different Approaches to Interoperability

Wes Rishel

The continuity of care record is an important healthcare dataset for sharing encounter summary information. Health Level Seven and ASTM International are offering alternative approaches to encoding the data.

WHAT YOU NEED TO KNOW

Users and implementers of computer-based patient record systems should rally around a single choice for Extensible Markup Language representation of the continuity of care record. Because the Clinical Document Architecture version offers a greater ability to leverage existing code and skills across many document types, it is the preferable approach. Users should implement their decision by making comments to the standards organizations and to the suppliers of their CPR systems. CPR suppliers should educate their users on the issue and state their positions to both standards groups.

ANALYSIS

At the Healthcare Information Management and Systems Society Annual Conference in February 2005, Health Level Seven (HL7; see Note 1) demonstrated a version of the Continuity of Care Record (CCR) developed using its Clinical Document Architecture (CDA) r2. This dataset has also been the subject of a standards development activity in ASTM International. The healthcare industry does not need two standards for the CCR. Here, we examine the merits of each approach.

The CCR is a subset of a patient's medical record that can serve as a summary of an encounter or support a referral and be exchanged between two medical entities as a standard set of clinical information. This data set was initially developed as a paper form by physicians in the Massachusetts Medical Society who were later joined by the American Academy of Family Physicians and the American Academy of Pediatrics. Its greatest strength is this provenance. It is the first time that the physician community drove a standard to its specific data requirements.

Degrees of Interoperability

Developers of computer-based patient record (CPR; see Note 2) systems are working to create, store and exchange electronic copies of the documents, such as the CCR. As this capability is rolled out, it will contribute to safety and effective care by giving physicians access to summary information about care that a patient receives from other physicians. There are significant design choices on the optimal amount of interoperability.

Document interoperability. The industry will have an early win if the CCR data is simply exchanged in a format that is primarily text. There must be enough structured content to enable the receiving system to properly file and retrieve it; however, the majority of its content will be viewed by the receiving physician, so it does not have to be coded. This approach is sometimes called "document interoperability" or "message interoperability" because the communicating systems are interoperable enough to exchange, file and retrieve the human-readable data.

Computable interoperability. Further benefits are available if the electronic exchange includes additional structured data so that it can be retrieved or used algorithmically. For example, if the problems, diagnoses, therapies and findings are coded, the receiving physician's CPR system might be able to retrieve the report selectively on this information, merge it with other information sources and provide decision support to clinician users. This level of standardization is often called "computable interoperability" because the communicating systems have completed the extra work of being able to communicate the detailed semantics of the message.

Gartner categorizes CPR systems capable of performing these advanced functions as "Generation 3" CPR systems (see "The Gartner 2004 Criteria for the Enterprise CPR"). Such systems are coming into the market primarily for use in large care delivery organizations.

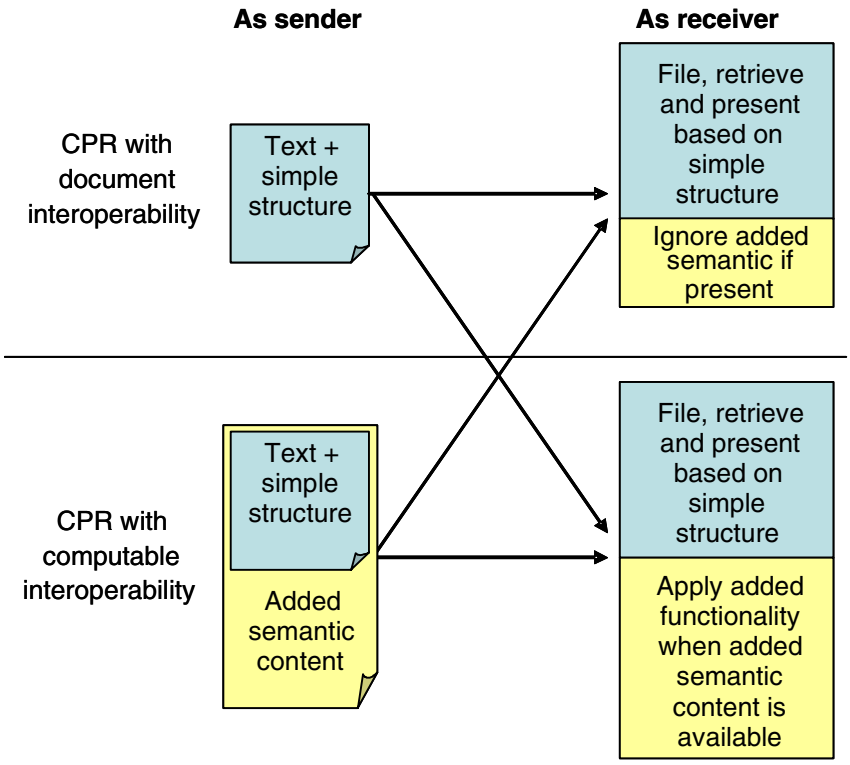
The HL7 Approach Features Incremental Interoperability

It is important not to burden early CPR system implementations with full computable interoperability. This puts the bar too high for those who develop and implement CPR systems. It would confine the benefit of the CCR to high-end CPR systems and delay achieving the primary early benefit of the electronic CCR — getting the text in front of physicians at the right point in their workflows.

It is equally important, however, to ensure that an exchange mechanism based on document interoperability is not a "dead end." Developers of CPR systems must be able to add semantics in an incremental fashion. Experience has shown that once interfaces are running in a multientity network, it is virtually impossible to "rip and replace" them with new interfaces.

Incremental interoperability is an approach that allows the benefits of document interoperability to be achieved early while enabling an evolutionary approach to computable interoperability (see Figure 1). The baseline is document interoperability, a document that consists of blocks of text and sufficient structured data for basic filing and retrieval. The minimum structured data should identify the patient, the provider, the type of document (such as CCR, procedure note, discharge summary), and its signature and revision status.

Figure 1. Variable Semantic Interoperability



Source: Gartner Research (March 2005)

Gartner

With incremental interoperability, all senders must send the base-level structure. All receivers must be able to accept, file and retrieve these simple documents. More-sophisticated sending systems may include additional structured semantics within the document. Sophisticated receivers will be able to put that extra information to use, although they will also handle simple documents from base-level senders. Unsophisticated receivers may not be able to process the advanced semantic information, but they must at least hide the structured information from humans who want to see the textual content.

The added semantic content in Figure 1 need not encode all of the information in the document. CPR systems in practical use will be able to capture some coded information (such as the problem list or prescribed medications) long before they can capture other information (such as a full history and physical or social history). Incremental semantic interoperability permits the communicating system to be opportunistic, creating and using more coded information as it becomes available over time.

Extensible Markup Language (XML) is a natural format for documents created with incremental semantic interoperability because it supports mixing textual and structural information. Structured information can be hidden within the text in a way that a processing program can easily extract the text and present it to a user. The program can just as easily extract the coded information for use in filing, retrieval and decision support.

The HL7 CDA represents a systematic approach to creating XML text documents with the option to include sophisticated semantic information. It has been designed from the start to support variable interoperability. HL7's CDA-based approach to claims attachments compliant with the U.S. Health Insurance Portability and Accountability Act (HIPAA) also used the CDA to achieve incremental interoperability (see "XML-Based Claims Attachments Business Benefits").

Standards Approaches

Two standards development organizations have approached implementing the CCR in XML with distinct approaches:

- ASTM is planning to ballot an ad hoc XML schema that can represent the data content of the CCR in a very straightforward way.
- HL7 is working on representing the CCR using CDA r2.

The ASTM approach has some ability to hide coded data in the same document. It supports some hidden semantics, but would have to be expanded dramatically to create full computable interoperability. This approach is more straightforward and, therefore, easier for CPR developers that will not be programming other CDA documents. This would be an advantage if the vision were that the CCR would be the only interface mechanisms among CPR systems.

Healthcare charts, however, contain hundreds of document types such as electrocardiogram, laboratory and other diagnostic results, procedure notes and specialized examinations for specific chronic diseases. Each such document should be defined by a caregiver group appropriate to its use and all should be standardized for exchange among CPR systems. The HL7 approach is to include the CCR as one kind of document within the CDA, which is a comprehensive and systematic approach to all clinical documents. The textual and coded data in a CDA document are represented in a consistent way across all document types. The coordination occurs through the HL7 Reference Information Model.

Because the HL7 schemas are designed to support a broader array of clinical information, developers require a bit more work to get started, but they are not as intimidating as some

developers may fear. In particular, although they *support* sophisticated semantics they do not *require* that senders create them or that receivers do anything more complex than ignore the sophisticated semantics.

Developers that have already programmed for other documents in CDA format will find the HL7 version easier than programming for a schema that is particular to the CCR. Although both approaches are young technologies, the CDA is already being used in a few projects in the United States and even more globally (see Table 1 for a partial list).

Table 1. Global CDA Usage

Project	Purpose	Locale
"Seamless Care"	Regional health exchange	Three hospital districts in Finland
Regional inbound documents	Various documents with replication to CPR and genomics systems (50,000 notes per week)	Mayo Health System
SCIPHOX	Referral and discharge letters between hospitals and physician office systems	Germany
e-MS	Medical record summary for referrals	British Columbia
HealthConnect	CCR-like report for referral/discharge summary	Australia
Health Event Summary	CCR-like report for referral/discharge summary	New Zealand

Source: Gartner Research (March 2005)

Incremental interoperability is the key to achieving the early benefits of CCR first, while leaving the door open for later implementations that can have the highest impact on care effectiveness and patient safety. The ASTM approach to the CCR does not now fully support incremental semantic interoperability, but could be expanded. The HL7 CDA-based approach to the CCR leverages all of the existing HL7 work on semantic interoperability in a way that does not demand sophisticated coding of early implementers. It also allows CPR developers to leverage current and future code dealing with other document types.

Key Issues

Within the next 36 months, what emerging information technologies and standards will be ready for adoption by healthcare organizations?

Note 1

Author Affiliation With HL7

The author of this research is a member of the HL7 board of directors and an author of the HL7 implementation guide for using HIPAA claims attachments.

Note 2

CPR vs. Electronic Health Record

In the United States, the term "electronic health record" (EHR) has been used in several senses, one of which is equivalent to the CPR. Gartner continues to use CPR to emphasize that the

system must more be more than an electronic file cabinet and because EHR is used in a different sense globally.

Acronym Key

CCR	continuity of care record
CDA	Clinical Document Architecture
CPR	computer-based patient record
EHR	electronic health record
HIPAA	U.S. Health Insurance Portability and Accountability Act
HL7	Health Level Seven
XML	Extensible Markup Language

REGIONAL HEADQUARTERS

Corporate Headquarters
56 Top Gallant Road
Stamford, CT 06902-7700
U.S.A.
+1 203 964 0069

European Headquarters
Tamesis
The Glanty
Egham
Surrey, TW20 9AW
UNITED KINGDOM
+44 1784 431611

Asia/Pacific Headquarters
Level 7, 40 Miller Street
North Sydney
New South Wales 2060
AUSTRALIA
+61 2 9459 4600

Latin America Headquarters
Av. Nacões Unidas 12.551
9 andar — WTC
04578-903 Sao Paulo SP
BRAZIL
+55 11 3443 1509

Gartner