Interoperability in Health Care
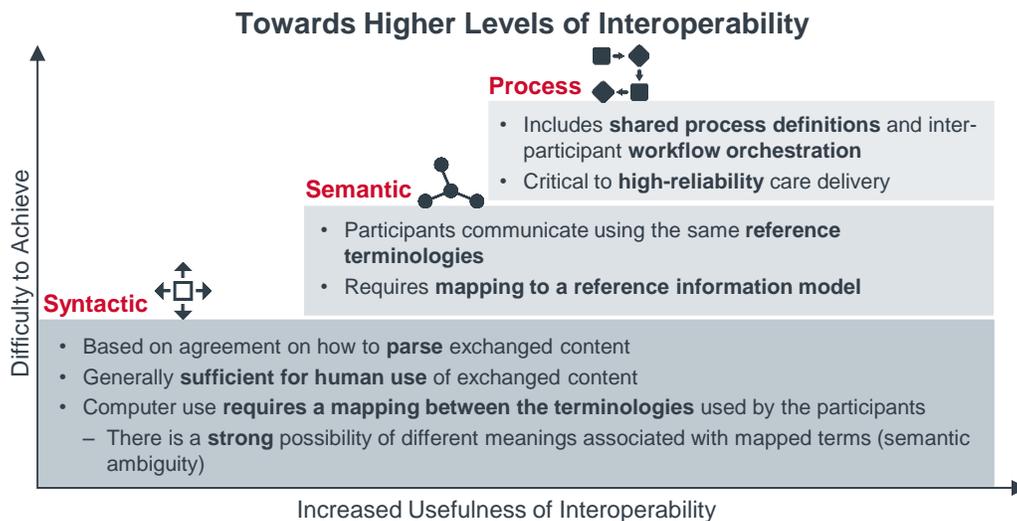
Educational Briefing for Non-IT Executives

Executive Summary

The rapid adoption of electronic health records (EHRs), coupled with rising clinical and business needs for cross-continuum data, are driving a renewed focus on interoperability technologies. Population health, quality reporting, ACO[1] operations, and provider network management all depend on sharing data on activities across many different care settings, which are likely to use separate IT systems. Interoperability is the ability to connect health care data and technology-driven processes so that they are fit for their intended usage by the receiving user or application. A new generation of data standards and exchange consortiums are attempting to lower the cost and accelerate time-to-value for interoperability projects, but these new capabilities will require new IT staff skills and close attention to provider and vendor commitments.

What is Interoperability?

Interoperability is the capability of distinct information systems to exchange data and connect processes in a way that is useful to an end user or process. In health care, interoperability aims to give providers access to patient data from across the care continuum, coordinate processes across applications and health system members, and unlock secondary uses of data for analysis and research. Interoperability initiatives often extend beyond providers to include payers, public health agencies, individual patients, and others. The data exchanged can include clinical, financial, and demographic data from a variety of systems. Care coordination, population health, and enterprise analytics programs are particularly dependent on interoperability, as they aim to knit together activities from across a broad network of providers and patient touch points. Interoperability is often thought of as a series of "levels" of sophistication, as depicted below. *Syntactic* interoperability deals in basic questions of structure (e.g., the expected components of a lab result) and is often sufficient for a human to understand. *Semantic* interoperability requires agreement on the vocabulary used to communicate (e.g., our lab results are LOINC[2] coded) and is typically a requirement for data analysis, decision support, and process automation. *Process* interoperability coordinates processes and workflow across partners to enable reliable, seamless delivery of care.

Towards Higher Levels of Interoperability

Process
- Includes **shared process definitions** and inter-participant **workflow orchestration**
- Critical to **high-reliability** care delivery

Semantic
- Participants communicate using the same **reference terminologies**
- Requires **mapping to a reference information model**

Syntactic
- Based on agreement on how to **parse** exchanged content
- Generally **sufficient for human use** of exchanged content
- Computer use **requires a mapping between the terminologies** used by the participants
  - There is a **strong** possibility of different meanings associated with mapped terms (semantic ambiguity)

Difficulty to Achieve (vertical axis)

Increased Usefulness of Interoperability (horizontal axis)

How is Interoperability implemented in health care?

Organizations use a variety of techniques and standards to exchange data and coordinate processes. Organizations such as the CommonWell Health Alliance, Carequality, the NwHIN[3] Direct Project, and a patchwork of state and regional health information exchanges (HIEs) support the basic connection of disparate health systems. Technical standards, including HL7[4] 2.x and 3.x, CDA,[5] and the fledgling FHIR[6] standard contribute to Syntactic and Semantic agreement. At the highest level, custom integration with EHR workflows, rules, business process engines, and open APIs[7] help support full Process interoperability.

1) ACO = Acountable care organization; 2) LOINC = Logical Observation Identifiers Names and Codes, a standard lab code set created by the Regenstrief Institute; 3) NwHIN Direct = Nationwide Health Information Network Direct, a secure email infrastructure for US health care providers; 4) HL7 = Health Level Seven, an international health care standards body; 5) CDA = Clinical Document Architecture, a patient summary document standard; 6) FHIR = Fast Healthcare Interoperability Resources; 7) API = Application program interface.

Source: Health Care IT Advisor research and analysis.

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Why is it important?

Population health, care coordination, provider network curation, and system-wide operational analytics all depend on visibility into information across a network of organizations, often using disparate IT systems with conflicting data and communications standards. Consumers and clinicians increasingly expect data to follow them seamlessly across multiple care settings. These business drivers demand a renewed focus on technologies to enable the seamless but secure flow of data across systems. Organizations that build mature interoperability capabilities are better positioned to analyze their operations, optimize workflows, and deliver efficient, reliable care that wins patient loyalty.

How does Interoperability affect health care providers and IT leaders?

Non-IT and IT leaders need to ensure that their organizations or their vendors aren't intentionally or unintentionally blocking data sharing. Also, IT leaders should take a more active role in development of strategic capabilities in interoperability. HCOs with a collection of legacy integration approaches should consider establishing a common enterprise architecture that streamlines new integration projects. IT leaders must ensure that an effective data governance program is in place to more reliably derive value from partner data, and tactical data integration requests for specific projects should be evaluated in the context of other strategic goals for the relationship. Leaders can also build relationships with regional public exchanges, which can be a cost-efficient way to establish baseline interoperability with an extended network of trading partners. Finally, it's important to build staff skills and push for vendor commitments on the next generation of interoperability technologies, including FHIR and open APIs.

A Ten-Step Interoperability Strategy for Providers/IT Leaders

Interoperability Strategy Key Steps			
1	Develop an enterprise architecture strategy—For M&A,[1] evaluate the best integration pathway (e.g., absorb, blend, augment, replace, preserve)	6	Develop a shared master directory of providers and organizations using descriptive role-based identifiers
2	Identify and stratify exchange stakeholders including partners and affiliates—build trust with shared goals	7	Establish an Enterprise Master Patient Index (EMPI) capability to reconcile patient data across partners
3	Agree on prioritized use cases for what information to exchange and when—utilize standard national (ONC[2]) formats and protocols	8	Establish a data governance program—Utilize a trust framework that includes legal terms and policy requirements
4	Focus on owned entities and close partners first—Employ private exchange capabilities to ensure the highest-fidelity exchange and control	9	Implement a consent management solution that supports privacy but does not inhibit proper data use for medical care and system-wide improvement
5	Connect to extended affiliates and others through public exchanges if available or other low-coordination approaches (Direct)	10	Target exchange capabilities that go beyond regulatory minimums—Consumerism and new value-based and risk-based payment models demand cross-continuum data

Questions That Hospital Executives Should Ask Themselves

1. How does interoperability advance our clinical, business, and patient-related goals?

2. Do we have a mature data governance program?

3. How can we extend our exchange network to partners to improve operational and analytical capabilities?

Additional Advisory Board research and support available

Report: Interoperability Update: FHIR

Webconference: Interoperability: Are We Lifting Together?

1) M&A = Mergers and acquisitions; 2) ONC = Office of National Coordinator for Health Information Technology.

Source: Health Care IT Advisor research and analysis.

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