Interoperability in Health Care

Educational Briefing for Non-IT Executives

Executive Summary

The rapid adoption of electronic medical records (EMRs), coupled with rising clinical and business needs for cross-continuum data, are driving a renewed focus on interoperability technologies. Population health, quality reporting, value-based payments, 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 consortia 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 programmes 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 LOINC1 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

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)

Semantic

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

Process

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

Increased Usefulness of Interoperability

How is Interoperability implemented in health care?

Organisations use a variety of techniques and standards to exchange data and coordinate processes. Technical standards, including HL72 2.x and 3.x, CDA,3 and the fledgling FHIR4 standard contribute to Syntactic and Semantic agreement. At the highest level, custom integration with EMR workflows, rules, business process engines, and open APIs5 help support full Process interoperability.

1) LOINC = Logical Observation Identifiers Names and Codes, a standard lab code set created by the Regenstrief Institute; 2) HL7 = Health Level Seven, an international health care standards body; 3) CDA = Clinical Document Architecture, a patient summary document standard; 4) FHIR = Fast Healthcare Interoperability Resources; 5) API = Application programme interface.

Source: Advisory Board interview and analysis.
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 organisations, 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. Organisations that build mature interoperability capabilities are better positioned to analyse their operations, optimise 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 organisations 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. Health care organisations 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 programme 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 is 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

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

Additional Advisory Board research and support

Report: Interoperability Update: FHIR

1) M&A = Mergers and acquisitions; 2) A shift away from fee-for-service and toward risk-based payment models.