Health Information Exchange: Reality and Future
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Conflict of Interest Disclosure
Kenneth A. Kleinberg

Has no real or apparent conflicts of interest to report.
Learning Objectives

• Identify the business and technical needs for health information exchange in support of Meaningful Use and the enablement of care coordination
• Compare the inherent strengths and challenges of the various enterprise EMR vendors, HIE vendors, specialty vendors (e.g., for e-prescribing and lab results) and payers, regarding their HIE capabilities in support of private and public exchange
• Recognize how HIEs will increasingly be used to support repositories, registries, data warehouses and business intelligence/analytics including population health
• Identify the most important terminology and exchange standards that will be required for MU and for cross HIE exchange with regional, state and national HIE initiatives
• Develop a roadmap for health information exchange success
Some HIE Vendor Surveys

“KLAS, Jan 2012”
- Interviewed 96 health care execs
- Top vendors selected for public exchanges were Optum/Axolotl, InterSystems, Aetna/Medicity, Orion Health.
- Those reported to winning the most private exchanges were Cerner, dbMotion, Epic, Medicity, and RelayHealth
- Affordability and vendor integration experience topped the decision criteria

“eHealth Initiative, Oct 2012”
- Of 300+ exchanges identified, 127 exchanges completed the survey
- 40% of respondents supporting ACOs or PCMHs
- Thirty-six initiatives reported competition from other HIEs was an important challenge, and 50 expressed concern about competition from health IT system vendors offering exchange solutions

“HIMSS/Capsite, Nov 2012”
- 400 organizations surveyed, (95 percent were hospitals or hospital systems)
- 71 percent planning on investing in new HIE technologies in the next 24 months
- 84 percent said they would select the same HIE vendor again.
## Questions in Health Information Exchange

### Goals and Costs
- What are the different goals of private vs. public exchanges?
- What does mean for an exchange to be operational or sustainable?
- How much should it cost to participate in an HIE?

### Scope and Government
- What role should the state play in HIE – should there be state-wide exchanges?
- What is a better consent model: opt-in or opt-out?
- Will we ever have a national HIE – what will it look like and who will control it?

### Technology and Standards
- Which HIE architectural models work best in which type of exchanges?
- How will MU stage 2 and 3 drive the use of HIEs?
- Is The Direct Project a positive or negative development in the evolution of HIE?
- How is patient matching and provider identification best handled in an HIE?
- What role will standards (e.g., IHE) and open source play in HIE?
- What role will HIEs play in supporting registries, patient portals, PHRs, and analytics?

### Vendors
- What category of vendors will be most successful in enabling HIE?
- How are the HIE capabilities of EMR vendors evolving?
- What impact will the acquisition of HIE vendors by payers have on the market?
# Four Models for Health Information Exchange

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Best For</th>
<th>Infrastructure Requirements</th>
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</thead>
<tbody>
<tr>
<td>1) Point-to-Point</td>
<td>Point-to-point push connectivity on secure common transport between participants known to each other via out of band mechanisms</td>
<td>Ad-hoc push communication between trusted entities such as physician practices (e.g., fax replacement)</td>
<td>Minimal - secure internet and/or e-mail connectivity</td>
</tr>
<tr>
<td>2) Hub and Spoke</td>
<td>Every entity establishes an interface with a centrally managed hub that can store and forward messages</td>
<td>An IDS with known business partners with permanent transaction needs</td>
<td>Modest – requires an integration broker (aka interface engine)</td>
</tr>
<tr>
<td>3) Central Repository</td>
<td>Entities connect to and read from a centrally managed database and send update transactions for database posting</td>
<td>IDSs and some exchanges where real time access, performance and analytics are important</td>
<td>High (potentially) - requires an EMPI, DBMS, integration broker, capacity to store significant amounts of data and responds to queries from many entities</td>
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<tr>
<td>4) IHE/XDS</td>
<td>Participating entities respond to requests to send documents to each other</td>
<td>IDSs, exchanges, States and looser federations of entities that need to send documents to each other</td>
<td>Modest - must maintain an EMPI and record locator services for what documents are available</td>
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</tbody>
</table>

Source: Health Care Advisory Board interviews and analysis.
## Value of Model for Private and Public Exchanges

<table>
<thead>
<tr>
<th>Database- or Document-centric</th>
<th>Model</th>
<th>Private</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database</td>
<td>Centralized</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Federated</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Document</td>
<td>Centralized</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
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<td>High</td>
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Source: Health Care Advisory Board interviews and analysis.
# Boundaries of Health Information Exchanges

<table>
<thead>
<tr>
<th>Type</th>
<th>Strengths</th>
<th>Challenges</th>
<th>Future</th>
</tr>
</thead>
</table>
| Private ACO| • Serve own interests first  
• Greater control and faster development  
• Trust and data sharing higher  
• More readily span regions and states | • Entity bears the full cost  
• Integration with multiple regional and state HIEs | • Strong and rapid growth in support of CI and ACOs  
• Increased partnerships with payers |
| Regional   | • Provides at least some needed record sharing between competitors  
• Shared costs  
• “Healthcare is local” | • Many dependent on government funding  
• Managed by small orgs  
• Lack of trust issues  
• Who pays? | • Less relevant as standards advance  
• Less viable as government funding is reduced  
• Consolidation within states |
| State      | • Government funding  
• Shared services, directories  
• Primarily serves state needs | • Integrate many regional HIEs  
• Does not meet need of multi-state ACOs | • Limited to certain services, such as provider IDs, credentialing, reporting |
| National   | • Broadest approach of locating a patient and records  
• Connect to government agencies | • Patient identification, RLS  
• Lowest common denominator exchange | • Used primarily for ad-hoc push (Direct)  
• Most exchanges able to connect in 5 years |

Source: Health Care Advisory Board interviews and analysis.
Harder Problems Require Simpler Solutions...

Local/Private  
Region/Metro  
State  
National  

Easier  
Patient Matching  
Record Locater  
Consent Management...  
Way Harder!

1  
Agree on a format for summary of care (Consolidated CDA)

2  
Agree on transport and exchange standards (Direct and CONNECT)

3  
Require providers to populate a patient’s PHR and let the patient manage consent

Source: Health Care Advisory Board interviews and analysis.
# Major HIE Selection Criteria

<table>
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<tr>
<th>Capability</th>
<th>Examples/Details</th>
<th>Issues to be Considered</th>
</tr>
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<tbody>
<tr>
<td><strong>Architectural Models and Date Integration</strong></td>
<td>Point-to-Point, Hub and Spoke, Centralized Database, IHE/XDS</td>
<td>Where will data be stored and hosted and who will have access to it</td>
</tr>
<tr>
<td><strong>EMPI and RLS</strong></td>
<td>Probabilistic, deterministic, configurable</td>
<td>What is known about the identity and location of patients and records</td>
</tr>
<tr>
<td><strong>Data Exchange and Standards</strong></td>
<td>Exchange of messages, data, documents Clinical and admin. (use of Direct, CONNECT)</td>
<td>What needs to be exchanged and how granular and standardized</td>
</tr>
<tr>
<td><strong>CDR/ODS and Virtual Repository</strong></td>
<td>CDSS, knowledge-based alerting, normalization, terminology translation</td>
<td>How will CDSS functionality be integrated with physician workflow</td>
</tr>
<tr>
<td><strong>Data Warehouse and BI/Analytics</strong></td>
<td>Data mining, predictive modeling, analytics, simulation, data visualization</td>
<td>Can the right data and tools be assembled for ACO requirements</td>
</tr>
<tr>
<td><strong>User Access and Reporting</strong></td>
<td>Access via portals, mobile devices, reporting to registries, states, feds,</td>
<td>Are data and results available via preferred devices and applications</td>
</tr>
<tr>
<td><strong>Privacy and Security</strong></td>
<td>Multi-factor authentication, role-based security, opt-in/out, break-glass, auditing, single sign-on,</td>
<td>Can the right level of privacy and security be delivered</td>
</tr>
<tr>
<td><strong>Clinical Groupware</strong></td>
<td>eRx, lite EMR, PHR, PACS viewing, registries</td>
<td>Will the HIE vendor be viewed as competitive with the EMR vendors</td>
</tr>
<tr>
<td><strong>Hosting and Support</strong></td>
<td>Client and vendor hosting, pricing models (e.g., subscription), support models, training,</td>
<td>Will the HIE vendor help recruit</td>
</tr>
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Source: Health Care Advisory Board interviews and analysis.
## HIE Market: Everyone Wants to Get into Da Act

<table>
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<tr>
<th>Category</th>
<th>Representative Examples</th>
<th>Strengths</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise EMR Vendors</td>
<td>Epic, Allscripts, Cerner, Siemens…</td>
<td>Established client base of IDSs, some experience with ambulatory, lab and payer integration</td>
<td>Competing EMR vendors will not play in the “sandbox”</td>
</tr>
<tr>
<td>HIE Vendors</td>
<td>Covisint, dbMotion, HealthUnity, ICA, Intersystems, Orion</td>
<td>Built for HIEs, have connectors and adapters to most ambulatory and lab systems, support for centralized and federated models</td>
<td>Often reliant on grants and government-based non-sustainable funding sources – acquisition targets</td>
</tr>
<tr>
<td>Telecom Carriers</td>
<td>Verizon, AT&amp;T</td>
<td>Knows data communications, scalability and redundancy</td>
<td>Lack of clinical HIE experience</td>
</tr>
<tr>
<td>Specialty Networks</td>
<td>Surescripts, MedPlus</td>
<td>Existing extensive national backbone connectivity with providers, payers, labs</td>
<td>Subset of HIE needs</td>
</tr>
<tr>
<td>Payers</td>
<td>United Health/Axolotl, Aetna/Medicity, Humana/Certify</td>
<td>Experienced with transaction networks/clearinghouses and analytics</td>
<td>Payer “parents” not trusted by providers – have different agendas</td>
</tr>
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</table>

Source: Health Care Advisory Board interviews and analysis.
Matching HIE needs to Vendor Capabilities and Architecture

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<th>Checklist for HIE Vendor Selection</th>
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<tr>
<td>Understand your primary acute care/enterprise vendor’s HIE capabilities, use of standards, partners and roadmap first</td>
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<tr>
<td>Determine differing architectural model needs for private vs. public exchanges</td>
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<tr>
<td>Be aware of major local, regional and state health exchange initiatives – what vendors are in use? Can you connect to them?</td>
</tr>
<tr>
<td>Utilize services of other exchanges if cost or time effective – be cautious of dependencies – are they sustainable?</td>
</tr>
<tr>
<td>Look for HIE vendors with strong document repository, patient portal, registry and analytics capabilities</td>
</tr>
<tr>
<td>When doing vendor evaluations do the due diligence for reference sites</td>
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</tbody>
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Thank You!

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