

HIT Standards Committee

NwHIN Power Team

Updated Scores, Grids and DRAFT Recommendations
September 16, 2011

Methodology (1 of 2)

1. Evaluate specifications generated by Exchange and Direct pilots on the following factors:
 - Need for specified capability
 - Maturity of the specification
 - Maturity of the underlying technology used in the specification
 - Deployment and Operational Complexity
 - Industry adoption
 - Available alternatives
2. Identify specifications that provide capabilities for which the business need is “Low”
3. Identify specifications that are in early or moderate stages of development, and the technologies used are in a declining phase of their life-cycle
4. Identify specifications that introduce significant deployment, operational, and administrative complexity, and that have low industry adoption

Methodology (2 of 2)

5. Consider alternatives

- Sources
 - NwHIN Power Team identification of standards and solutions that have been broadly adopted by healthcare, other than the Exchange and Direct specifications
 - Other industry standards
- In considering suitability of alternatives, use the same criteria as those used for NwHIN and Direct specifications

6. Subjectively assess whether any gaps remain that may be addressed with new specifications

Scores – Exchange Specifications (1 of 2)

Spec	Need	Maturity of Spec	Maturity of Underlying Technology	Deployment, Operational, and Administrative Complexity	Industry Adoption	Alternatives
<i>NHIN Messaging Platform Specification</i>	High	High	Mature	Moderate (Mature tools available to deploy and manage the services)	Low	REST style; Direct Secure Transport
<i>NHIN Web Services Registry Specification</i>	Moderate/High	Moderate	Declining	High	Low	LDAP Provider Directories; DNS look-up for certificates (Direct)
<i>NHIN Authorization Framework Specification</i>	High	Moderate/High	Mature	High (Complexity is primarily a reflection of ensuring security)	Low	OAuth 2.0 OpenID for SOAP Authentication Framework; TLS over REST
<i>NHIN Patient Discovery Specification</i>	High (high need, spec has problems)	High	Mature	High	Low	PCAST model
<i>NHIN Query for Documents Specification</i>	Moderate	High	Mature	Moderate/High	Low	REST style

Scores – Exchange Specifications (2 of 2)

Spec	Need	Maturity of Spec	Maturity of Underlying Technology	Deployment, Operational, and Administrative Complexity	Industry Adoption	Alternatives
<i>NHIN Retrieve Documents Specification</i>	Moderate	High	Mature	Moderate	Low	REST style
<i>NHIN Access Consent Policies Specification</i>	Low	Low	Emerging	High	Low	Metadata Power Team recommendation (HL7 CDA R2 with HL7, LOINC, and new vocab)
<i>NHIN Health Information Event Management (HIEM) Specification</i>	Low	Moderate	Mature	Not enough knowledge	Low	
<i>NHIN Document Submission Specification</i>	Moderate	High	Maturing	Low	Low	REST style
<i>NHIN Administrative Distribution Specification</i>	Moderate	Moderate	Maturing	Low	Low	REST style or other push solution

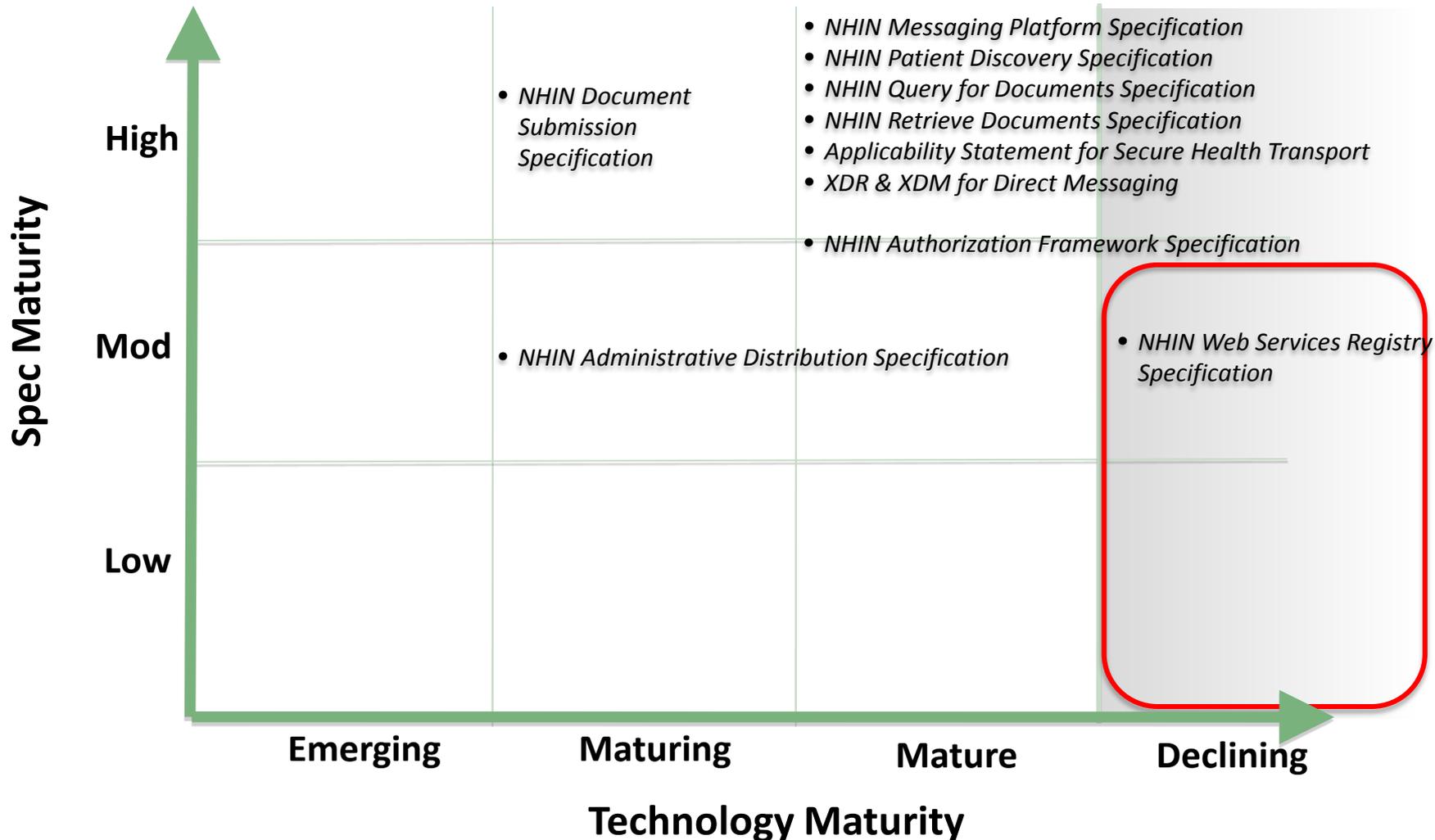
Scores – Direct Specifications

Spec	Need	Maturity of Spec	Maturity of Underlying Technology	Deployment, Operational, and Administrative Complexity	Industry Adoption	Alternatives
<i>Applicability Statement for Secure Health Transport</i>	High	High	Mature	Moderate/High (mainly due to encryption, certificate mgmt)	Low	SOAP Transport, REST style
<i>XDR & XDM for Direct Messaging</i>	High	High	Mature	Moderate	Low	Direct to email inbox

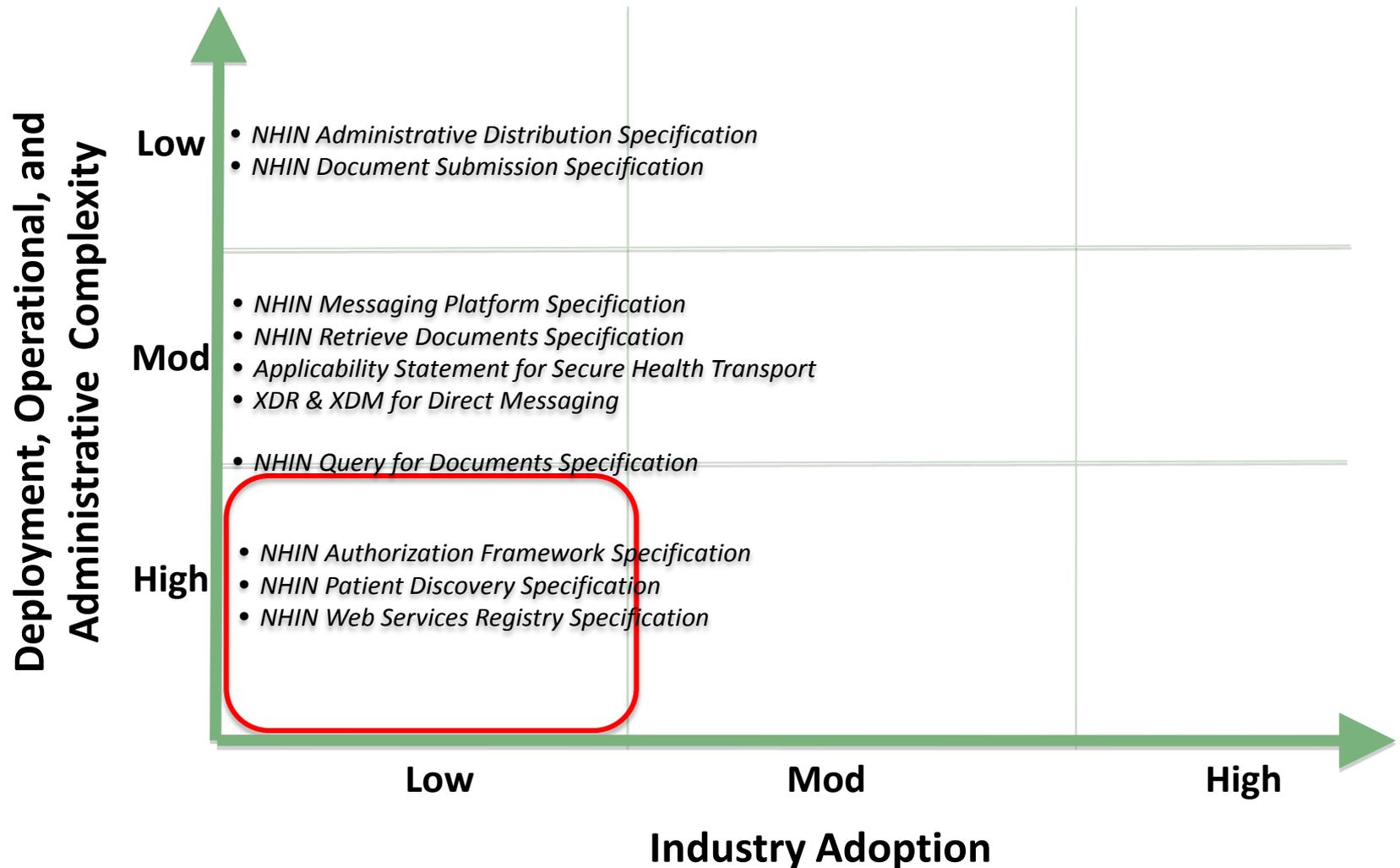
Specifications for Which Business Need is “Low”

- *NHIN Access Consent Policies Specification*
- *NHIN Health Information Event Management (HIEM) Specification*

Maturity of Specification x Maturity of Underlying Technology



Deployment, Operational, and Administrative Complexity x Industry Adoption



DRAFT
Conclusions
for PT Discussion

Conclusions and Recommendations (1 of 7)

1. Architecture is important. The set of standards, services, and policies that comprise the Nationwide Health Information Network (NwHIN) must be deployable within an architectural framework capable of supporting the secure exchange of health information at a national scale.
 - Standards, services, and policies need to address transport, security, and clinical content, including standards for clinical documents and controlled vocabulary. Structured clinical documents and controlled vocabulary should be equally valuable regardless of the NwHIN secure transport used; conversely, any NwHIN secure transport should support the full range of health information exchange, from unstructured (and perhaps incomplete) data to structured, coded data.

Conclusions and Recommendations (2 of 7)

2. Neither the Exchange specifications nor the Direct specifications have been adopted beyond their pilots. They have not been proven at large scale, in production environments, across a broad range of healthcare organizations. The scalability of the underlying architectures, and inherent impacts on workflow, need to be better understood before these specifications are codified into regulations. Once these specifications have been deployed at much larger scale, across a broader spectrum of healthcare users, they should be re-assessed against the criteria used in this exercise to determine suitability as a nationwide standard.

Conclusions and Recommendations (3 of 7)

3. If a healthcare organization has committed to the use of SOAP-based web services, the Exchange specifications should be considered as a potential solution for the secure exchange of health information.
4. If a healthcare organization is seeking a simple solution for asynchronously exchanging health information with another healthcare organization, the Direct specifications should be considered.

Conclusions and Recommendations (4 of 7)

5. The Exchange specifications are highly complex, and designed to support an architecture that may not be appropriate for all healthcare organizations, and that may not scale to nationwide implementation
 - “Too many layers ... debugging is very hard due to the complexity of the layered approach ... all layered protocols have this problem, but this is the most complex we have encountered” (implementer testimony)
 - Version skew among layered protocols makes it hard to manage widespread deployments
 - *NHIN Patient Discovery Specification* is problematic and cumbersome, and presents a “serious challenge to scalability beyond a limited pilot;” patient matching challenges disrupt provider workflow
 - *NHIN Query for Documents Specification* poses operational challenges
 - No agreed upon way to query for specific item, such as “most recent ECG,” which forces download large chunks of the patient's record from multiple sites
 - Does not handle images well (largely due to under-constrained specifications on how to handle extremely large files)
 - C32 definitions are not precise enough to allow for seamless importing of external data elements
 - *NHIN Retrieve Documents Specification* 's method of accumulating query results causes long delays, huge messages, and frequent time-outs

Conclusions and Recommendations (5 of 7)

6. The Exchange specifications present opportunities for simplification
 - Two specifications address needs judged “low” in our analysis
 - *NHIN Access Consent Policies Specification*
 - *NHIN Health Information Event Management (HIEM) Specification*
 - *NHIN Web Services Registry Specification* – a moderately mature specification that uses technology in its declining phase of the life-cycle [Note: The Standards and Interoperability Framework team is already considering alternatives to this specification]
 - *NHIN Authorization Framework Specification* – highly complex, and alternatives exist (e.g., OAuth)
 - *NHIN Patient Discovery Specification* (highly complex) and *NHIN Query for Documents Specification* (operational and workflow challenges)
 - Need more scalable architecture to support patient discovery
 - Because the *Query for Documents*, *Patient Discovery*, and *Retrieve Documents* specifications are usually implemented together, any alternatives should be considered within this context

Conclusions and Recommendations (6 of 7)

7. Some areas are underspecified in the current specification set
 - Exchange or remote viewing of large images
 - Discovery and retrieval of data elements (e.g., lab results) outside a “document” context
 - More granular query capability for patient records (e.g., “most recent ECG”)

Addressing these needs may present opportunities to consider the PCAST model for data discovery using indexed metadata, combined with retrieval of the desired data element or object (e.g., image) – a model that may be more scalable for patient-discovery as well.

Conclusions and Recommendations (7 of 7)

8. Industry is trending toward widespread use of the REST architectural style in designing networked systems – presents opportunity to develop new specification for RESTful exchange of healthcare information
 - REST is not a “standard,” but a “style” that uses the HTTP standard communication protocol to provide a simpler alternative to SOAP for accessing web services – not all “RESTful” implementations are implemented in the same way
 - REST is not inherently secure, but can be secured using standards such as TLS and OAuth
 - Developing a specification for “secure RESTful transport for healthcare exchange” would provide healthcare organizations assurance that RESTful implementations built in accordance with the specification would be predictable and secured

Glossary

Term	Definition
Deployment, Operational, and Administrative Complexity	<p>Criterion used to evaluate Exchange and Direct specifications. Subjective assessment (low, moderate, high) that considers ease of implementation, maintenance throughout on-going operations, and administrative complexity across organizations.</p> <ul style="list-style-type: none"> • Can be handled with ease by IT support (Low) • Need a modest administrative support for deployment and maintenance over time (Moderate) • Need a substantial on-going IT investment to support the service (High) • Introduces administrative complexity that spans organizations; requires high degree of federation; project complexity (High)
Direct specifications	<p>Two (2) specification documents developed and implemented by participants in the Direct pilot; available from http://wiki.directproject.org/Documentation+Library</p>
Exchange specifications	<p>Ten (10) specification documents implemented by participants in the Exchange pilot; available from http://healthit.hhs.gov/portal/server.pt/community/healthit_hhs_gov_nhin_inventory/1486</p>
Industry Adoption	<p>Criterion used to evaluate Exchange and Direct specifications. Assessed (low, moderate, high) relative to the market segment for which the specification was developed. Initial scores were derived from responses to objective questions on Exchange usage. Scores were reviewed by the Power Team, who concluded that since neither the Exchange specifications nor the Direct specifications had been adopted beyond the ONC pilots, all should be judged “low.” Factors considered include:</p> <ul style="list-style-type: none"> • Currently deployed as production offering by “x” number / percentage of vendors • Significant volume potential (e.g. within 12 months; full deployment, etc.)

Glossary

Term	Definition
Maturity of Specification	<p>Criterion used to evaluate Exchange and Direct specifications. Subjective assessment (low, moderate, high) from survey conducted by NwHIN Exchange Coordinating Committee, plus ONC and NIST inputs, plus review inputs from Power Team. Factors considered include:</p> <ul style="list-style-type: none">• Specification still in development (low)• Clear and unambiguous (moderate)• Testable (moderate-high)• Maintainable (moderate-high)• Fully tested and piloted (high)
Maturity of Underlying Technology	<p>Criterion used to evaluate Exchange and Direct specifications. ONC subjective assessment (emerging, maturing, mature, declining) of the maturity of the technologies used in the specification, with respect to the complete technology life-cycle; plus review inputs from Power Team. Factors considered include:</p> <ul style="list-style-type: none">• New unproven standard, building industry support (emerging)• Gaining market adoption, but less than 30% industry adoption (maturing)• Mainstream adoption (mature)• Declining support (declining)

Glossary

Term	Definition
Nationwide Health Information Network (NwHIN)	The set of standards, services and policies that enable secure health information exchange over the Internet. (ONC definition)
Need	Criterion used to evaluate Exchange and Direct specifications. Subjective judgment (low, moderate, high) from ONC, focused on whether the specification is needed for meaningful-use, federal agencies, or to meet other national needs, plus review inputs from Power Team. Factors considered include: <ul style="list-style-type: none"><li data-bbox="562 639 1083 672">• Lacks specific, compelling needs (low)<li data-bbox="562 676 1591 709">• Needed for meaningful use (moderate-high, considering remaining 3 factors)<li data-bbox="562 714 857 746">• Federal agency need<li data-bbox="562 751 983 783">• Other National HIT needs, etc.
PCAST	President’s Council of Advisors on Science and Technology (PCAST) report to the President, “Realizing the Full Potential of Health Information Technology to Improve Healthcare for Americans: The Path Forward,” published December 2010