# Individual Evaluation Worksheet

This evaluation worksheet is used to summarize the ratings assigned to the specification for each criterion, using the metrics for in Appendix A. Evaluators will assign a rating to the specification under evaluation. After assigning ratings for all criteria, the evaluator should then assign a single rating for Maturity (Section 1) and Adoptability (Section 2). Ratings for each criterion, attribute, and Maturity/Adoptability category should use the following codes.

|  |
| --- |
| **Rating Codes** |
| **Code** | **Name** | **Notes** |
| L | Low | Specification aligns to Low metrics. |
| M | Moderate | Specification aligns to Moderate metrics. |
| H | High | Specification aligns to High metrics. |
| UNK | Unknown | Reviewer cannot make a determination for this attribute or criteria. |
| NA | Not Applicable | Attribute or criteria does not apply to the specification under evaluation. |

A High (H) rating for each criterion or attribute is always positively correlated with a recommendation for National Standards status. A Low rating for each criterion or attribute is always positively correlated with a recommendation for Emerging Standards status.

**Evaluator: ­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Specification Evaluated: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

# Maturity Criteria

| **Maturity of Specification** |
| --- |
| **Criteria Attributes** | **Rating** | **Notes / Justification** |
| Breadth of Support |  |  |
| Stability |  |  |
| Adoption of Specification |  |  |
| **Overall Rating** |  |  |

| **Maturity of Underlying Technology Components** |
| --- |
| **Criteria Attributes** | **Rating** | **Notes / Justification****NOTE: Please identify the underlying technology component(s) that contributed to your rating.**  |
| Breadth of Support |  |  |
| Stability |  |  |
| Adoption of Technology  |  |  |
| Platform Support |  |  |
| Maturity of the Technology Within its Life Cycle |  |  |
| **Overall Rating** |  |  |

| **Market Adoption** |
| --- |
| **Criteria Attributes** | **Rating** | **Notes / Justification** |
| Installed Health Care User Base |  |  |
| Installed User Base Outside Health Care |  |  |
| Interoperable Implementations  |  |  |
| Future Projections and Anticipated Support |  |  |
| Investments in User Training |  |  |
| **Overall Rating** |  |  |

**Maturity Rating: \_\_\_\_\_\_\_\_\_**

# Adoptability Criteria

| **Ease of Implementation and Deployment** |
| --- |
| **Criteria Attributes** | **Rating** | **Notes / Justification** |
| Availability of Off-the-Shelf Infrastructure to Support Implementation |  |  |
| Standard as Success Factor |  |  |
| Conformance Criteria and Tests |  |  |
| Availability of Reference Implementations |  |  |
| Specification Modularity |  |  |
| Quality and Clarity of Specifications |  |  |
| Separation of Concerns |  |  |
| Ease of Use of Specification |  |  |
| Degree to which Specification Uses Familiar Terms to Describe “Real-World” Concepts |  |  |
| Runtime Decoupling |  |  |
| Appropriate Optionality |  |  |
| **Overall Rating** |  |  |

| **Ease of Operations** |
| --- |
| **Criteria Attributes** | **Rating** | **Notes / Justification** |
| Comparison of Targeted Scale of Deployment to Actual Scale Deployed |  |  |
| Number of Operational Issues Identified in Deployment |  |  |
| Degree of Peer-Coordination of Technical Experts Needed |  |  |
| Operational Scalability (i.e. Operational Impact of Adding a Single Node) |  |  |
| Fit to Purpose |  |  |
| **Overall Rating** |  |  |

| **Intellectual Property** |
| --- |
| **Criteria Attributes** | **Rating** | **Notes / Justification** |
| Openness |  |  |
| Affordability |  |  |
| Licensing Permissiveness |  |  |
| Copyright Centralization |  |  |
| Freedom from Patent Impediments |  |  |
| **Overall Rating** |  |  |

**Adoptability Rating: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Appendix A: Attribute Metrics**

**Maturity Metrics**

| **Maturity of Specification** |
| --- |
| **Attributes** | **Metrics** |
| **Low** | **Moderate** | **High** |
| **Breadth of Support** | * No contributing community or without activity
* 1 organization supporting authorship and/or review
* No support services other than public forums or mail lists
* No implementation/ training services
* Standard not in formal discussion by a national or international ‘voluntary consensus standards body’\*
 | * Existing community with notable activity
* 2-5 organizations supporting authorship and/or review
* Single organization provides support service
* Single organization provides implementation/ training services
* Standard is under formal review and/or balloting by a national or international voluntary consensus standards body
 | * Strong community with numerous contributors and advocates throughout industry
* >5 organizations supporting authorship and/or review
* Multiple organizations provide support services
* Multiple organizations provide implementation/ training services
* Standard is a ‘voluntary consensus standard’\*\*
 |
| **Stability** | * Unstable with numerous releases generating side effects
* Standard has history of several known problems which can be prohibitive for adoption
* Age of oldest known conforming implementation is less than 3 months
 | * Stabilized release process but difficulties with development process to respond to industry required changes
* No known history of major problems or crises
* Age of oldest known conforming implementation is 3 months – 3 years
 | * Stabilized releases providing minor corrections to core standard. New core functionality changes in response to industry required changes
* No known history of major problems or crises
* Age of oldest known conforming implementation is more than 3 years
 |
| **Adoption of** **Specification** | * No references (informal blogs to formal papers) identified of the standard’s specification in use
* Existing specification with indications of decline (moved from “Declining” under Maturity of Specification criteria):
	+ Existing community but no or little activity in last year
	+ Reduced organizations supporting authorship
	+ No new implementations
	+ Critical programs analyzing replacement or upgrades options
	+ Lacking support for new or emerging technology or products
 | * Few references of specification’s use on non-critical programs (i.e. in pilot)
* Current adopters of specification represent the intended adopter organizations in terms of size and organization type.
 | * Numerous references of specification’s use in production for critical programs
* Current adopters of specification represent the intended adopter organizations in terms of size and organization type.
 |
| \*A “voluntary consensus standards body" is a domestic or international organization that plans, develops, establishes, or coordinates voluntary consensus standards using agreed-upon procedures, and that adheres to the principles of openness, balance of interest, due process, appeals process, and consensus\*\* A “voluntary consensus standard” is a standard adopted by a “voluntary consensus standards body.”- Definitions adopted from OMB Circular A-119, Revised. February 10, 1998 |

| **Maturity of Underlying Technology Components** |
| --- |
| **Attributes** | **Metrics** |
| **Low** | **Moderate** | **High** |
| **Breadth of Support**  | One or more core technology components have: * No contributing community or an inactive community
* 1-2 individuals leading development or not clearly defined
* Fewer than 3 developers or not clearly identified
* No support services other than public forums or mail lists
* No implementation/ training services
 | Most core technology components have:* Existing community with notable activity
* 3-5 individuals leading development
* 3-7 developers or more, but turnover high
* Single organization provides support services
* Single organization provides implementation/ training services
 | All core technology components have:* Strong community with numerous contributors and advocates throughout industry
* >5 individuals leading development
* >7 developers with low turnover
* Multiple organizations provide support services
* Multiple organizations provide implementation/ training services
 |
| **Stability** | One or more core technology components:* Are unstable with numerous releases generating side effects
* Have a history of several known problems that can be prohibitive for adoption
* Have no known implementations in operation for more than 3 months
 | Most core technology components have:* A stabilized release process but development process is incapable of responding to industry requirements.
* No known history of major problems or crises
* Known implementations in operation from3 months – 3 years
 | All core technology components have:* A stabilized release process

and a development process that implements new core functionality changes in response to industry requiremenets. * No known history of major problems or crises
* Multiple known implementations in operation for over 3 years
 |
| **Adoption of Technology**  | One or more core technology components:* Have not been referenced in any other standard identified
* Is an existing technology with indications of decline:

 - Existing community but no or little activity in last year - Reduced development staff with high turn over - No new implementations - Critical programs analyzing replacement or upgrades options - Lacking support for new or emerging technology or products - Technology readiness stalled or stopped before TRL-9\*  | All core technology components have: * Been implemented only in non-critical programs (i.e. in pilot)
* Been implemented for use cases similar to those addressed by the specification under evaluation
 | All core technology components have: * Numerous references of use in production for critical programs
* Been implemented for use cases similar to those addressed by the specification under evaluation
 |
| **Platform Support**  | One or more core technology components: * Supports only one platform
 | All core technology components: * Support multiple platforms but require additional effort or expertise
 | All core technology components: * Support multiple platforms with no or minimal effort
 |
| **Maturity of the Technology within its Life Cycle**  | * The maturity of one or more core technology components is characterized as TRL 7: System prototype demonstrated in operational environment.
 | * The maturity of one or more core technology components is characterized as

TRL 8: Actual system completed and qualified through test and demonstration. Technology has been proven to work in its final form and under expected conditions.  | * The maturity of all core technology components is characterized as

TRL 9: Actual system proven through successful mission operations. Actual application of technology in its final form and under mission conditions.  |
| \* Technical Readiness Levels:TRL 1: Basic principles observed and reported. Research begins.TRL 2: Technology concept and/or application formulated. Prototyping begins.TRL 3: Analytical and experimental critical function and/or characteristic proof of concept. Active R&D initiated, including analytical studies and lab studies to physically validate technology.TRL 4: Component validation in a lab environment. Technological components are integrated in “low fidelity” setting.TRL 5: Component validation in relevant environment. Technological components integrated with reasonably realistic supporting elements in an increased fidelity and simulated environment.TRL 6: System/subsystem model or prototype demonstration in relevant environment. Prototype is tested in relevant and “high-fidelity” simulated environment.TRL 7: System prototype demonstrated in operational environment. TRL 8: Actual system completed and qualified through test and demonstration. Technology has been proven to work in its final form and under expected conditions.TRL 9: Actual system proven through successful mission operations. Actual application of technology in its final form and under mission conditions. |

| **Market Adoption** |
| --- |
| **Attributes** | **Metrics** |
| **Low** | **Moderate** | **High** |
| **Installed Health Care User Base**  | * Few users other than the developers of the standard or pilots within health care market, or
* Well established standard, but anticipating decline in future use
 | * Detectable references of use outside of developers of pilots within health care market
 | * Numerous users and numerous references to large user bases
 |
| **Installed User Base Outside Health Care**  | * Few users other than the developers of the standard or pilots, or
* Well established standard, but anticipating decline in future use
 | * Detectable references of use outside of developers of pilots
 | * Numerous users and numerous references to large user bases
 |
| **Interoperable Implementations**  | * 0 - 1 non-coordinated implementations
* Degree of interoperability is undetermined
 | * 2 - 4 non-coordinated implementations
* Some indications of interoperability between at least 2 implementations
 | * 5+ non-coordinated implementations
* Interoperability established for entire standard between at least 2 implementations
 |
| **Future Projections and Anticipated Support**  | * No roadmap, future projections, or announcements
 | * Future announcements of releases and community activities are provided to limited audience on an irregular basis
 | * Roadmap and future announcements of releases are tightly coupled and are provided to a broad audience (members and public) on regular basis
* Standard in broad use, projecting to continue
 |
| **Investments in User Training**  | * Few users investing in training on use of standard
 | * Limited user investment in learning , primarily through indirect means such as discussion boards
 | * Active user investments in training
* Multiple training modes available, such as code-a-thons, webinars, classroom training
 |

**Adoptability Metrics**

| **Ease of Implementation/Deployment** |
| --- |
| **Attributes** | **Metrics** |
| **Low** | **Moderate** | **High** |
| **Availability of Off-the-Shelf Infrastructure to Support Implementation**  | * Few off-the-shelf infrastructure components are available or can be purchased to support implementation
 | * Some of supporting infrastructure components can be purchased off-the-self
 | * Most of supporting infrastructure components can be purchased off-the-self
 |
| **Standard as Success Factor**  | * Many deployed implementations cite standard as a challenge to deployment
* Few cite standard as success factor
 | * No consensus view among deployed implementations on whether standard is a success factor or challenge to deployment
 | * Many deployed implementation cite standard as a success factor
* Few cite standard as challenge to deployment
 |
| **Conformance Criteria and Tests**  | * Incomplete conformance criteria
* Conformance tools and/or methodology not applied in any setting
* No automated tests available
 | * Complete conformance criteria
* Conformance tools and/or methodology applied in a lab or demo setting
* Automated tests exists for at least some part of standard.
 | * Complete conformance criteria
* Conformance tools and/or methodology applied to at least one operational implementation.
* Significant automated test support
 |
| **Availability of Reference Implementations**  | * No reference implementations
 | * Well-established reference implementations on a limited set of platforms
 | * Multiple reference implementations on multiple platforms
 |
| **Specification Modularity**  | * Monolithic specification that cannot be decomposed into smaller parts without some loss of context; or
* Modularity exists but does does not align well with the business problem
 | * Specification is somewhat modular but requires additional references for context; or
* Specification is modular but modules are unevenly aligned with the business problem
 | * Specification is composed of one or more modules
* If large, specification can easily be decomposed to simpler smaller parts
* Modularity aligns well with the business problem, and parts are unambiguously identified
 |
| **Quality and Clarity of Specifications**  | * Semantics not well defined and no evidence of interoperability
* Inconsistent or ambiguous terminology within standard
* Low terminology coherence with referenced or dependent standards
 | * Defined semantics but evidence of some difficulty interoperating with other systems or networks
* Consistent, unambiguous terminology within standard
* Ad-hoc terminology alignment with any referenced or dependent standards
 | * Precisely defined semantics and providing evidence of interoperability with other systems or networks
* Consistent, unambiguous terminology within standard
* Explicit terminology alignment with any referenced or dependent standards
 |
| **Separation of Concerns**  | * Competing standards. Referenced standards solve the same business problem as the standard under evaluation.
 | * Partial overlap. Referenced standards solve part of the business problem as the standard under evaluation.
 | * Clean separation. Referenced standards do not solve the same business problem as the standard under evaluation.
 |
| **Ease of Use of Specification**  | * Requires highly specialized expertise in multiple technologies to read and understand specification
* Specification not appropriate as a starting point for maintenance
 | * With moderate effort specification can be used as a starting point for maintenance
 | * Easily read and understood by domain experts
* Easily used as a starting point for maintenance activities
* Navigation links provided or indexed
 |
| **Degree to which Specification Uses Familiar Terms to Describe “Real-World” Concepts**  | * Few concepts in standard are based on terminology currently used in industry
* Concepts are not defined in business language
 | * Some to majority of concepts in standard are based on terminology currently used in industry
* Concepts are loosely defined in business language
 | * Most concepts in standard are based on terminology well established in the industry
* Concepts in specification expressively described in business language
 |
| **Runtime Decoupling**  | * Tightly coupled to one or more externally defined interfaces. Content or Common Coupling with one or more systems.
 | * Mix of tight and loose coupling to externally defined interfaces.
 | * Loosely coupled to externally defined interfaces. Message and Data coupling only.
 |
| **Appropriate Optionality**  | * Standard requires the implementer to choose from among alternatives to meet interoperability use cases
* No or limited optionality to support compatibility with earlier or later versions
* Implementers cite optionality as a barrier to interoperability.
 | * Interoperability use cases partially met by implementations that ignore (at runtime) or do not implement (at design time) optional elements
 | * Interoperability use cases met by implementations that ignore (at runtime) or do not implement (at design time) optional elements
* Optional elements support compatibility with earlier or later versions
* Implementers cite optionality as aiding interoperability.
 |

| **Ease of Operations** |
| --- |
| **Attributes** | **Metrics** |
| **Low** | **Moderate** | **High** |
| **Comparison of Targeted Scale of Deployment to Actual Scale Deployed**  | * No documented or advertised scale at which standard is intended to be deployed
 | * Scale is documented in standard but no evidence that the scale as been achieved in operations
 | * Scale is documented in standard and evidence that scale has been achieved or exceeded in operations
 |
| **Number of Operational Issues Identified in Deployment**  | * Several critical issues identified during deployment and are high risks to operations
 | * Several issues identified during deployment but all mitigated through operational activities
 | * Few issues identified during deployment
 |
| **Degree of Peer-Coordination of Technical Experts Needed**  | * Peer-coordination of technical experts required on daily basis
 | * Peer-coordination of technical experts on frequent periodic basis
 | * Minimal peer-coordination of technical experts required on as-needed basis
 |
| **Operational Scalability (i.e. operational impact of adding a single node)**  | * Addition of nodes creates exponential impacts to operational effort or complexity for either implementers or users
 | * Addition of nodes creates linear impacts to operational effort or complexity for either implementers or users
 | * Addition of nodes has little to no additional impacts to operational effort or complexity for either implementers or users
 |
| **Fit to Purpose**  | * Some target use cases are met by the standard and specifications
* For met use cases, some main and/or alternative flows for high priority target use cases not met
 | * A majority of target use cases are met by the standard and specifications
* For met use cases, main and alternative flows for high priority target use cases met
 | * All or nearly all target use cases are met by use of the standard and specifications
* Main and alternative flows for high and medium priority target use cases met
 |

| **Intellectual Property** |
| --- |
| **Attributes** | **Metrics** |
| **Low** | **Moderate** | **High** |
| **Openness** | * Closed to few individuals or entities
 | * Limited to only members or contributing organizations
 | * Open to public
 |
| **Affordability** | * Fees associated with accessing standard specifications
* High costs for use and documentation which are deemed prohibitive for high adoption
 | * No fee for accessing standard specifications but fees or restrictions on referenced specifications (e.g. Vocabularies)
* Nominal costs to use standard and documentation
 | * No fees for accessing standard or referenced specifications
* No costs to use standard and standard documentation
 |
| **Licensing Permissiveness** | * License places one or more restrictions on runtime usage of conforming implementations
 | * License required to develop implementation, but no runtime restrictions.
* Derivative works restricted
* Negotiated agreement for use (i.e. SNOMED)
 | * Unrestricted for any use (commercial, academic, governmental)
* Perpetual use rights
* Derivative work allowed
* Unlimited number of users or instances
 |
| **Copyright Centralization** | * Rights held by numerous individuals, making relicensing very difficult
 | * Rights held by a few individuals or entities
 | * Rights held by a legal entity whom the community trusts and relicensing process is clear and streamlined
 |
| **Freedom from Patent Impediments**  | * Patent encumbered: Known or anticipated patented methods required for conformance to standard
 | * RAND terms: Contributors to standard agree to reasonable and non-discriminatory (RAND) terms for their contributed material
 | * No known or anticipated patents required to implement any portion of the specification, or
* Patents to protect openness: Contributors to standard make patented methods available with zero royalty (RAND with zero royalty) available to all implementers (open license)
 |