# 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) |