Consortium for State and Regional Interoperability

The Health Data Utility Capability Model **Guidebook**

Contents

health data utility (HDU) (noun)

a not-for-profit organization or state government entity with information exchange at its core and multi-stakeholder governance which, through its mission and function, seeks to meet the comprehensive health data delivery and analytics needs of a state's public and private sectors.

Introduction

The Health Data Utility Capability Model (Capability Model) is a new tool for characterizing and assessing the maturity level of health data utilities (HDUs) to support the advancement of interoperability and health data exchange to promote improvements in health and healthcare. Developed by the Consortium for State and Regional Interoperability (CSRI), a collection of the nation's largest and most robust nonprofit health data networks, the HDU Capability Model builds upon CSRI's Maturity Model v1.0, released in April 2023.

The Capability Model is a tool that state and federal agencies and private sector stakeholders can use to determine whether an HDU meets their specific needs related to data and analytic services. It provides a practical, stakeholder-driven method that describes 170+ core capabilities of HDUs and those required to deliver value and services to the five key stakeholders they serve — providers (including medical, dental/oral health, and vision/eye care providers), public and private sector payers, public health agencies, researchers, and patients.

The Capability Model moves beyond a binary, step-function maturity ladder by combining foundational requirements with a weighted scoring method. The result is a clearer, more proportional view of what an HDU can reliably deliver today and where to invest next, without reducing complex performance to a simple checklist.

The model can assist state policymakers with decision-making related to the formal designation of HDUs. It also offers a road map and guidance to emerging HDUs and health information exchange organizations (HIEs) that wish to deliver new services to stakeholder groups or pursue HDU distinction.

The HDU Capability Model was developed with considerable input from key stakeholders, as well as HDUs, HIEs, and representatives of states and federal agencies. The model also reflects a review of requirements outlined in federal interoperability and data reporting rules and guidance as well as existing literature, information, and input provided by Civitas Networks for Health®, a national collaborative comprised of member organizations working to use health information exchange, data use, and cross-sector collaboration to improve health.

This Guidebook offers information to support organizations that are using the HDU model to inform their strategy. It is also useful for stakeholders who want to assess an organization's capabilities as an HDU, helping them to confidently secure data and analytics services from them.

The HDU Capability Model is intended to support:

- **Public and private sector stakeholders** who rely on health data to better understand the extent to which an HDU is meeting their specific needs.
- **Policymakers** who are considering designation and/or further development of HDUs to support health data connectivity at the state and national levels.
- **HIEs and other organizations** who can use the HDU model as a roadmap and standard to communicate the value and alignment of their data services with stakeholder needs.

Background and Rationale

Building on Federal Investments To Address Unmet Interoperability Needs

Over the last two decades, the healthcare system in the United States has undergone a significant transformation through digitization, beginning with the adoption of electronic health records (EHRs) made possible by more than $40 billion in investments from the federal government. However, to fully realize the benefits of information technology (IT) in healthcare, the following are needed: interoperability and the exchange of comprehensive, high-quality data across organizations that deliver, pay for, and otherwise support improvements in health and healthcare. While much progress has been made, interoperability and exchange of health data do not occur consistently across health-related organizations in the U.S. today.

Congress has passed legislation, and the federal government has issued numerous regulations designed to promote interoperability and the sharing of information across organizations, thereby improving care delivery. U.S. investments in interoperability have achieved isolated successes to date but have yet to establish a cohesive national system of accessible and usable data. The Trusted Exchange Framework and Common Agreement™, also known as TEFCA™, has made some headway in supporting point-to-point data exchange to support care delivery through the designation of Qualified Health Information Networks (QHINs); TEFCA QHINs and other national networks primarily focus on enabling cross-network query routing and access. However, efforts to leverage existing electronic data sources to meet population health-related needs, such as those related to quality measurement, value-based payment, public health, and research, in a uniform, comprehensive way, have been lacking, leading to a patchwork of highly fragmented efforts, which vary in maturity and scope.

Significant pockets of robust health information exchange do exist. HDUs have emerged in several states as the most mature, mission-oriented options, offering a combination of technical capabilities, trusted governance, and sustainable business models. HDUs that demonstrate the capabilities described in the Capability Model expand on the services that TEFCA facilitates by providing multi-source integration, data normalization, identity resolution, consent orchestration, and program-specific operations such as those needed for Medicaid, public health, and emergency response.

In addition, HDUs demonstrating the capabilities outlined in the Capability Model combine claims, clinical, and public health data to deliver fit-for-purpose services that national backbones alone typically do not provide, including quality analytics, targeted alerts, research cohort development, and cross-sector referrals. They also offer multi-stakeholder governance with local accountability, supported by bylaws, transparent decision-making processes, and regular stakeholder feedback loops.

Given the long road toward interoperability and health information exchange — often with mixed results — it is imperative that the U.S. develop more robust tools to measure not only simple connectivity, but also demonstrable capability. It is no longer enough to prove that systems are connected; organizations must show they are fit for purpose, with measurable performance indicators, such as P95 latency for alerts, coverage across geographies and provider types, clear data provenance, and conformance to terminology standards. Similarly, expectations have evolved from point-in-time attestations to the provision of "living" evidence.

Getting to more robust interoperability and exchange that supports the needs of those who deliver, pay for, and otherwise support health and healthcare in the U.S. requires agreement on and robust methods to measure — using verifiable artifacts — data and analytic services required for providers, payers, public health, researchers, patients, and others.

In addition, success increasingly depends on breaking down program silos in favor of blended data approaches. High-performing programs, whether in quality measurement, prior authorization, or public health, rely on linked claims and clinical data, as well as, where applicable, cross-sector social needs datasets, all governed by robust consent frameworks.

The Capability Model provides a road map and a standard set of capabilities that are necessary to support the universal needs of providers, payers, public health, researchers, and patients who are using third-party applications to access their health data, which can be applied both nationally and at the state level, taking into account state-specific privacy laws and policies. The model is also designed to align with policy, enabling a clean crosswalk to federal and state interoperability requirements, such as use of APIs, claims, clinical data integration, and patient or provider access.

The Capability Model offers states a standardized tool to confidently and consistently evaluate an organization's capability as an HDU. Federal agencies can rely on the Capability Model as they assess options supporting their population health-related needs, including those related to quality measurement, value-based payment, public health, post-market surveillance, and research.

Addressing Gaps in Interoperability in Exchange

Users of health information exchange services and those who deliver them often face many common challenges. The Capability Model offers a verifiable and comparable tool to determine whether an HDU can effectively address these common issues to support states and other key stakeholders.

- **Fragmented data and uneven coverage:** Key datasets (e.g., clinical, claims, public health, social needs) are distributed across multiple networks and agencies; coverage varies by geography, payer, and care setting.
- **Limited fitness-for-use:** Data may be present but not normalized, timely, or linked to individual/organization identities with sufficient accuracy.
- **Consent/privacy complexity across sectors:** Varying legal requirements and program rules create complexity and slow exchange (e.g., 42 CFR Part 2; state-specific consent models; cross-sector information sharing).
- **Operational reliability gaps:** Onboarding timelines, uptime, and latency are often undocumented or inconsistent, limiting enterprise-critical use.
- **Procurement and accountability ambiguity:** States, payers, and health systems struggle to define precise requirements or compare HDUs objectively.

Public and private sector stakeholders require a verifiable, comparable method to determine whether an HDU can reliably support specified use cases at scale.

Overview of the HDU Capability Model

General Overview

At its core, the Capability Model defines each capability as an outcome-oriented statement that can be supported by verifiable evidence, enabling assessments to focus on observable outcomes rather than unverified attestations. By clearly specifying what must be achieved and how achievement is proven, the model provides a rigorous, implementation-agnostic framework that promotes consistency, comparability, and accountability across diverse contexts and technical approaches.

The Capability Model emphasizes fitness-for-purpose by evaluating data and services in the context of their intended use. The model is also stakeholder-centric, weighting capabilities by their relevance to each stakeholder group and publishing those weights for transparency. Its modular design allows capabilities to be added or removed without disrupting the overall structure. Finally, the model is designed to embed equity and ethics, incorporating measures to assess completeness, detect bias, and promote responsible data use.

The HDU Maturity Model gave the community a shared map; the HDU Capability Model turns that map into a measurable, evidence-verifiable GPS that is actionable for strategy, procurement, *and* designation, while remaining adaptable to evolving policy and stakeholder needs.

Overview of Capabilities

A capability is an outcome-focused, evidence-verifiable function that an HDU delivers at an agreed-upon scale and quality. Each capability is defined by a plain-language statement specifically describing the capability:

> ***"Automated transmission of case reports for notifiable conditions from EHRs to public health agencies using the eCR standard. This includes triggering case reporting based on clinical criteria and sending structured data."***

It can be supported by tangible evidence — such as policies, contracts, transaction logs, uptime dashboards, onboarding SLAs, API specifications, sampling logs, audit summaries, and other verifiable artifacts — that demonstrate its operation.

The Capability Model includes more than 170 capabilities in total, 50% of which are "shared," with the remaining 50% spread across five stakeholder-specific domains.

- **Shared domain capabilities** are core, cross-cutting enablers that underpin all other functions that include governance and sustainability, infrastructure and operations, data services, security and privacy, clinical data exchange, network breadth, analytics and reporting, and payer services.
- **Stakeholder domain capabilities** reflect the distinct requirements of key stakeholder groups — providers (including medical, dental/oral health, and vision/eye care providers), payers, public health, researchers, patients.

Figure 1 illustrates the relationship between shared domain capabilities and stakeholder domain capabilities.

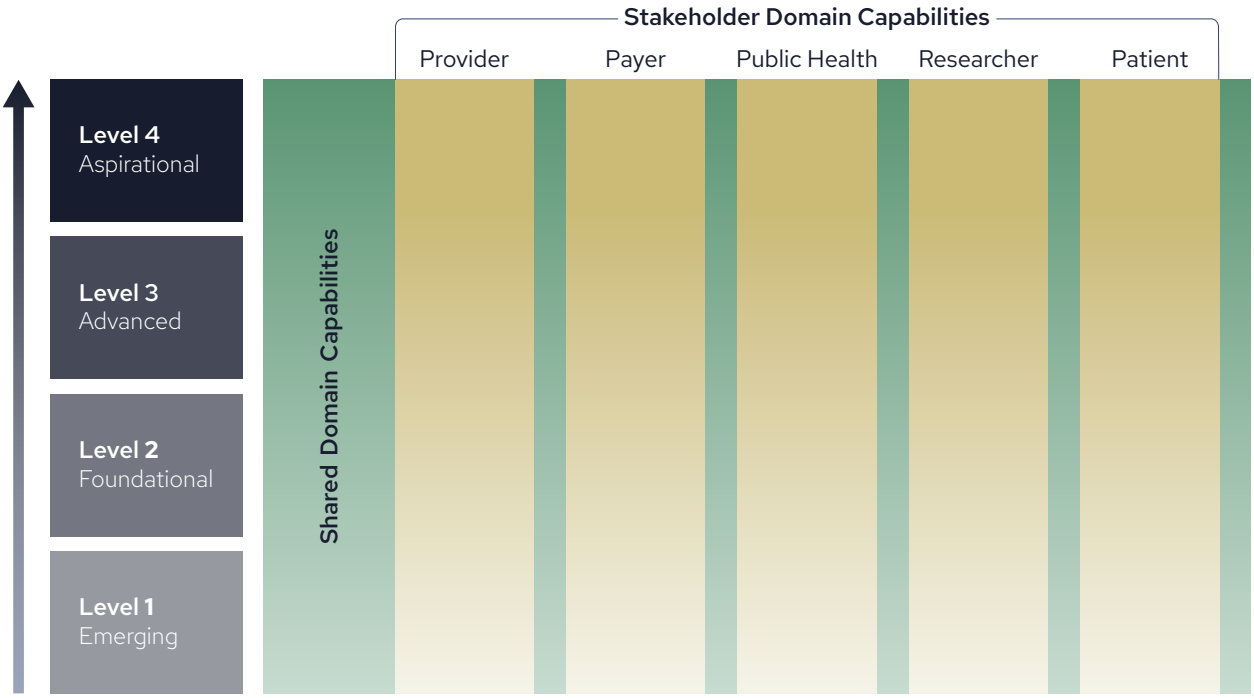

Figure 1. **Overview of the HDU Capability Model**

Levels of Advancements

Each capability is assigned a level, reflecting graduated sophistication as seen in Figure 2.

Level 4 – Aspirational – Statewide or multi-state operations with a broad profile of value propositions and continuous improvement processes, independent or third-party validation of performance, and demonstrable equity considerations embedded in operations, reporting, and governance.

Level 3 – Advanced – Scaled operation with established quality controls, active monitoring, and documented incident response procedures. Capabilities are deployed broadly within the declared scope, with performance tracked against agreed-upon metrics.

Level 2 – Foundational – Possesses key essential requirements, repeatable operation of capabilities at defined coverage and timeliness, meeting baseline functional requirements, and demonstrating consistent delivery of core services.

Level 1 – Emerging – Early-stage operations that are in planning or pilot phases, with limited coverage, inconsistent processes, and incomplete evidence of performance. Capabilities may be partially implemented or only available for a subset of the intended scope, and repeatability has not yet been established.

Figure 2. **Levels of Advancement**

Thresholds and Gates

The Capability Model and related scoring methodology use defined tier thresholds as a standard framework for interpreting readiness. These thresholds, as seen in Table 1, offer a consistent reference point across assessments. This ensures that scoring remains transparent and defensible, even when localized accommodations are made.

Advancement Level	Tier Thresholds
Aspirational	76-100
Advanced	51-75
Foundational	26-50
Emerging	0-25

Table 1. **Capability Model Levels of Advancement and Tier Thresholds**

The Capability Model incorporates critical capability gates – required capabilities like privacy and consent management, identity resolution, and incident response. These gates function as limiters; if an HDU fails to meet the minimum level (a capability score of 2 or 3) for any gate, its capability score is capped, often at the Foundational tier, until remediation is completed. This design ensures that essential safeguards and operational prerequisites are in place before higher performance levels are recognized, maintaining both the integrity of the model and the trust of stakeholders who depend on these capabilities.

There are approximately 50 gates across the shared domain and five stakeholder domains, outlined in Table 2 on the following page.

Capability Weights

Each capability also carries a domain relevance weight, indicating its importance to the specific use cases of different stakeholders. The weight reflects that some capabilities are more critical than others. The proportion of acute care hospitals an HDU is connected to, for example, may be heavily weighted. In contrast, the proportion of long-term care/post-acute care facilities may be weighted less heavily. The same capability, for example, may be critical for a domain like research and is given a weight of 100, but it is less crucial to payer uses and is given a weight of 50 for that stakeholder.

Each stakeholder uses the same, evidence-grounded capability definitions, but weights, thresholds, and artifacts differ. HIEs/HDU operators convert the model into a prioritized road map and ensure clear communication with their stakeholders.

	Shared	Provider	Payer	Public Health	Researcher	Patient
Emerging	• Acute Care Hospital Connectivity • Allergies / Intolerances Ingestion • Ambulatory Physician Connectivity • Ingest HL7 CCDA Messages • Ingest HL7 V2 Messages • Laboratory Results Ingestion • Master Patient Index (MPI) to Support Patient Matching • Multi-Sector Governance Body • Not for Profit Status or a State-Based Entity • Number of Unique Patients With More Than One Clinical Data Element in the MPI • Problems / Diagnoses Ingestion					
Foundational	• Basic Data Quality Process • Clinical Laboratory Connectivity • Conflict-of-Interest and Commercial Influence Firewall • Inpatient or Surgical Center Major Procedures Ingestion • Maintain Audit Trails and Immutable Access Logs • Maintain HITRUST® Certification • Maintain Longitudinal Patient Record • Monitoring and Service Management • Number of Unique Patients in the MPI • Patient Consent Management for Data Sharing • Provide Patient Opt-Out of Data Sharing • Sustainable Business Model • Transparent Data Access Practices	• Push Delivery of CCDAs • Clinician Portal with Longitudinal Records	• Push Delivery of Clinical Data (e.g., CCDA) to Payers	• Syndromic Surveillance • Electronic Lab Reporting (ELR)	• Cohort Discovery • Formalized Process for Review and Approval of Research Uses of the Data	• Patient Portal
Advanced	• Capability for Terminology and Code Mapping (LOINC, SNOMED CT, RxNorm, ICD-10, CPT, HCPCS, Z-codes) • Cross HDU Connectivity • Data Quality Validation Engine • Diversified Funding Strategy • Ingest HL7 FHIR Resources • Support for IHE Query and Retrieve Service (Record Locator + Longitudinal Composite Patient Summary) • TEFCA™ and Federal Interoperability Alignment	• Clinical Event Notifications	• Clinical Event Notifications • Clinician Portal with Longitudinal Records	• Immunization Information System (IIS) Submission	• Aggregate Data Into An OMOP CDM Instance • Maintain a Descriptive Summary of the Data Available for Research Use	• Patient FHIR API Access
Aspirational	• Capability for Terminology and Code Mapping (LOINC, SNOMED CT, RxNorm, ICD-10, CPT, HCPCS, Z-codes) Supported by a Formal Terminology Server • Capability to "Tag" Data Requiring Special Access or Additional Controls • Digital Identity and Trust Services (IAL2/CIAL) • Master Provider Index				• Patient Consent Management for Research Studies	

Table 2. **Gating Capabilities by Domain**

Capability Scoring

Traditional maturity models are easy to read but blunt as decision tools. They require organizations to cross fixed thresholds, e.g., "check five boxes to be Foundational, seven more to be Advanced, four more to be Aspirational," and treat every capability as all-or-nothing. This creates cliff effects, masks meaningful progress, and fails to distinguish strengths and needs by stakeholder. The Capability Model addresses these limitations by introducing a scoring system that recognizes partial attainment and differential importance, while preserving threshold signals for safety and trust.

Each capability within the model is scored based on the extent to which the HDU provides the capability (assessed on a 0-3 scale), the maturity level of the capability (Emerging to Aspirational), and a capability weight. The degree to which the HDU provides the capability can be assigned using a variety of methods. For example, an HDU might self-assess, or an organization might apply its own criteria, and in the future, a certifying body might assess the capability.

Determining how well an HDU performs on a given capability requires a thoughtful choice of methods; several approaches are possible:

- **Self-Assessed Likert Scale:** HDUs can complete structured self-assessments rating their performance on a 0-3 scale. This is low-cost and rapid but should be paired with validation over time to ensure credibility.
- **Structured Questionnaires:** Modeled after instruments such as the National Survey of Health Information Exchange Organizations (HIOs) stakeholders can pose standardized questions tied to each capability. Responses can then be mapped directly to scoring categories. For example, a question about "percentage of acute care hospitals connected" might map 0% to score 0, 1%-50% to score 1, 51%–80% to score 2, and >80% to score 3.
- **Formal KPI-Based Assessment:** For higher-stakes decisions, organizations may rely on more complex performance indicators. For example, the capability of "hospital connectivity" might be scored as the number of hospitals with interfaces divided by the total number of acute care hospitals in the state, with defined thresholds corresponding to scores of 0-3. Similarly, performance metrics such as ADT latency, API uptime, or the completeness of immunization records can serve as objective evidence.

The choice of method should align with the decision context. For example, a state may designate the organization that is best positioned to serve as its health data utility and require KPI-based assessment to document its ongoing development, while a payer conducting early due diligence may find a structured questionnaire sufficient. In all cases, the model is not intended as a binary gate, but as a continuum of capability. Organizations may be recognized as HDUs based on their progress along the continuum of capabilities as summarized by the stakeholder domain indices.

The full capabilities catalog listing 170+ capabilities provides a concrete, testable list of what HDUs do and how they prove it, with explicit dependencies and evidence expectations.

See the full catalog of capabilities at:
➤ thecsri.org/HDUcapabilities

Capability Index Scoring Methodology (by Stakeholder)

In addition to Capability Scoring, the Capability Model also generates a single score, known as the Capability Index, for each stakeholder domain, which ranges from 0 to 100. This index provides a clear, comparable view of how well an HDU delivers the capabilities most relevant to its stakeholders.

The score is calculated by dividing the total points earned for capabilities in a domain by the total possible points for that domain, excluding the Aspirational level, which represents above and beyond capabilities. The result is multiplied by 100. Shared and stakeholder specific domain indices are then averaged to generate the Capability Index.

This method highlights strengths, identifies gaps, and supports targeted planning for improvement. It also allows apples-to-apples comparisons across HDUs in procurement, funding, or policy contexts. In short, the Capability Index serves as both a performance snapshot and a decision support tool, linking technical capabilities to stakeholder value.

The model can be applied flexibly: as a qualitative checklist, a structured self assessment, or a quantitative scoring system, depending on stakeholder needs. This makes it a versatile tool for guiding procurement, funding, designation, certification, and continuous improvement.

An example of the scoring calculation for the Capability Index for providers is listed in Table 3. The Capability Performance is the assessment (however it was made) of how well the organization achieved the capability on a scale of 0-3, the Level Value is derived from the capability's Level of Advancement on a scale of 1-4 (i.e., a Foundational capability will be a 2), the Weight and Gate are values for that capability from the model, and Gate passed is determined based on the capability performance (requires a 2 or 3).

Calculating the Capability Index for a Stakeholder

▶ First, calculate the Stakeholder Domain Index:

1. Calculate the actual score for each capability within the stakeholder domain (e.g., Provider):
   - *Capability performance * Level Value * Weight*
2. Calculate the possible score for each capability within the stakeholder domain:
   - *3 (highest possible value) * Level Value * Weight*
3. Calculate the Stakeholder Domain Index:
   - *Sum of all actual scores divided by the sum of all possible scores*
   - *In the example (Table 3), this is 5,450/10,950 for a* **Provider Domain Index of 49.8.**

▶ Next, calculate the stakeholder Shared Domain Index:

1. Calculate the actual score for each capability within the shared domain:
   - *Capability performance * Level Value * Weight*
2. Calculate the possible score for each capability within the shared domain:
   - *3 (highest possible value) * Level Value * Weight*
3. Calculate the Shared Domain Index:
   - *Sum of all actual scores divided by the sum of all possible scores*
   - *In the example (Table 3), this is 39,950/59,250 for a* **Provider Shared Domain Index of 67.4.**

▶ Finally, calculate the Capability Index:

1. *Average of Stakeholder Domain Index and Shared Domain Index*
   - *In the example (Table 3), this is (49.8+67.4)/2 for a* **Capability Index for Providers of 58.6.**

Capability Name	Domain	Capability Performance	Level Value	Weight	Gate	Gate Passed	Actual Score	Possible Score	Index
Clinical Event Notification Routing to Care Team	**Provider**	0	4	50			0		
Clinical Event Notifications	**Provider**	3	3	100	TRUE	✓	900	900	
Clinician Portal with Longitudinal Records	**Provider**	3	2	100	TRUE	✓	600	600	
Closed-loop Referral Tracking	**Provider**	1	3	50			150	450	
Community-Based Organization (CBO) Referral Exchange	**Provider**	0	4	50			0		
Electronic Results Delivery	**Provider**	3	2	50			300	300	
Emergency Medical Services (EMS) Portal Access	**Provider**	3	4	50			600		
Image Sharing Across Organizations	**Provider**	3	3	50			450	450	
Integrated Clinical Decision Support via HIE	**Provider**	0	4	50			0		
Manage Advanced Directives (POLST/MOLST)	**Provider**	0	3	50			0	450	
Medication Reconciliation Support Services	**Provider**	0	4	50			0		
Prescription Drug Monitoring Program (PDMP) Integration	**Provider**	0	3	50			0	450	
Prior Auth/UM Support Services	**Provider**	0	4	50			0		
Provider API Access	**Provider**	3	3	50			450	450	
Push Delivery of CCDAs	**Provider**	3	2	100	TRUE	✓	600	600	
Single Sign-On (SSO) to Clinical Portal	**Provider**	3	2	100			600	600	
Social Determinants of Health Referral Integration	**Provider**	1	4	50			200		
Support For Disaster Recovery as a Redundant Clinical Source	**Provider**	3	4	50			600		
PROVIDER DOMAIN INDEX							5,450	10,950	49.8
Allergies / Intolerances Ingestion	**Shared**	3	1	100	TRUE	✓	300	300	
Ingest HL7 CCDA Messages	**Shared**	3	1	100	TRUE	✓	300	300	
Ingest HL7 V2 Messages	**Shared**	3	1	100	TRUE	✓	300	300	
Laboratory Results Ingestion	**Shared**	3	1	100	TRUE	✓	300	300	
Multi-Sector Governance Body	**Shared**	3	1	100	TRUE	✓	300	300	
Problems / Diagnoses Ingestion	**Shared**	3	1	100	TRUE	✓	300	300	

Table 3. **Example of Scoring for Provider Domain**

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Capability Name	Domain	Capability Performance	Level Value	Weight	Gate	Gate Passed	Actual Score	Possible Score	Index
Acute Care Hospital Connectivity	Shared	3	1	100	TRUE	✓	300	300	
Ambulatory Physician Connectivity	Shared	2	1	100	TRUE	✓	200	300	
Capability for Terminology and Code Mapping (LOINC, SNOMED CT, RxNorm, ICD-10, CPT, HCPCS, Z-codes) Supported by a Formal Terminology Server	Shared	0	4	100	TRUE	×	0		
De-duplication, Harmonization of Data	Shared	1	4	50			200		
Execute Clinical Logic Expressed in a Standard Formalism (Clinical Query Language) in Near Time	Shared	0	4	50			0		
Extract a Broad Set of Structured Data From Unstructured Sources Such as Notes	Shared	0	4	50			0		
Health Plan Connectivity	Shared	3	4	75			900		
Master Patient Index (MPI) to Support Patient Matching	Shared	3	1	100	TRUE	✓	300	300	
Master Provider Index	Shared	1	4	100	TRUE	×	400		
Not for Profit	Shared	3	1	100	TRUE	✓	300	300	
Number of Unique Patients With More Than One Clinical Data Element in the MPI	Shared	3	1	100	TRUE	✓	300	300	
Prescription Fill Status	Shared	1	4	50			200		
Social Service Agency Connectivity	Shared	1	4	75			300		
Vital-Records (Birth and Death) Integration	Shared	2	4	50			400		
Shared Domain Index	Shared						39,950	59,250	67.4
Capability Index									58.6

Table 3. **Example of Scoring for Provider Domain**

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Model Exclusions

It is important to note that the Capability Model is designed to provide capability definitions, establish evidence expectations, create level descriptors, apply stakeholder weighting, define a scoring methodology, and provide guidance for interpreting results. On the other hand, the model is not designed to prescribe specific vendor architectures, dictate a single consent policy, rank organizations beyond the defined indices, or replace statutory oversight.

Detailed Review of Capabilities

Shared Domain Capabilities

There are more than 90 shared domain capabilities in the Capability Model, which fall into the following eight categories:

Governance and sustainability, infrastructure and operations, data services, security and privacy, clinical data exchange, network breadth analytics and reporting, and payer services.

More than 30 of the shared capabilities are gating capabilities. A visual presentation of the shared capabilities contained in the Capability Model, organized by maturity level, is provided in Figure 3 below.

A full catalogue of all 170+ capabilities can be found **thecsri.org/HDUcapabilities**.

Figure 3. **Shared Domain Capabilities by Level**

Provider Domain Capabilities

Through the Capability Model, providers (including medical, dental/oral health, and vision/eye care providers) will gain a deeper understanding of the level at which HDUs access data from other healthcare providers, thereby improving clinical decision-making, promoting better care coordination, enhancing quality measurement processes, reducing the number of duplicative tests, and ensuring the ability to implement value-based care models.

Examples of provider domain capabilities include single sign-on (SSO) clinician portals with longitudinal records, push delivery of CCDAs, and clinical event notifications. Three of the 18 provider domain capabilities are gating capabilities. An overview of provider domain capabilities, stratified by level, is provided in Figure 4.

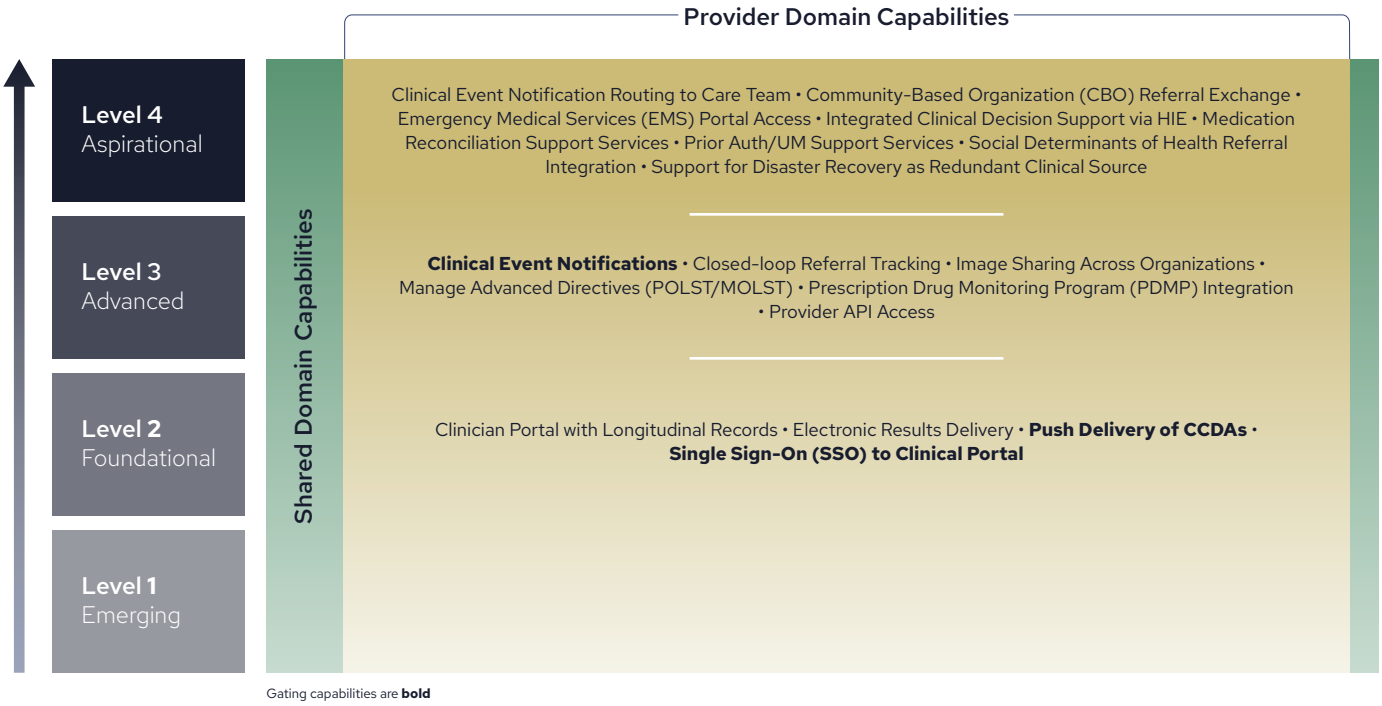

Figure 4. Provider Domain Capabilities by Level

Payer Domain Capabilities

The Capability Model enables payers to gain a better understanding of the level at which HDUs are generating more accurate and timely quality measurement and reporting, accessing data for value-based care models, improving prior authorization processes, and driving faster, more accurate claims adjudication.

Examples of payer domain capabilities include the push delivery of clinical data, clinical event notifications, data aggregator validation, and provider directory management. Three of the 24 payer domain capabilities are gating capabilities. An overview of payer domain capabilities, stratified by level, contained in the Capability Model is provided in Figure 5.

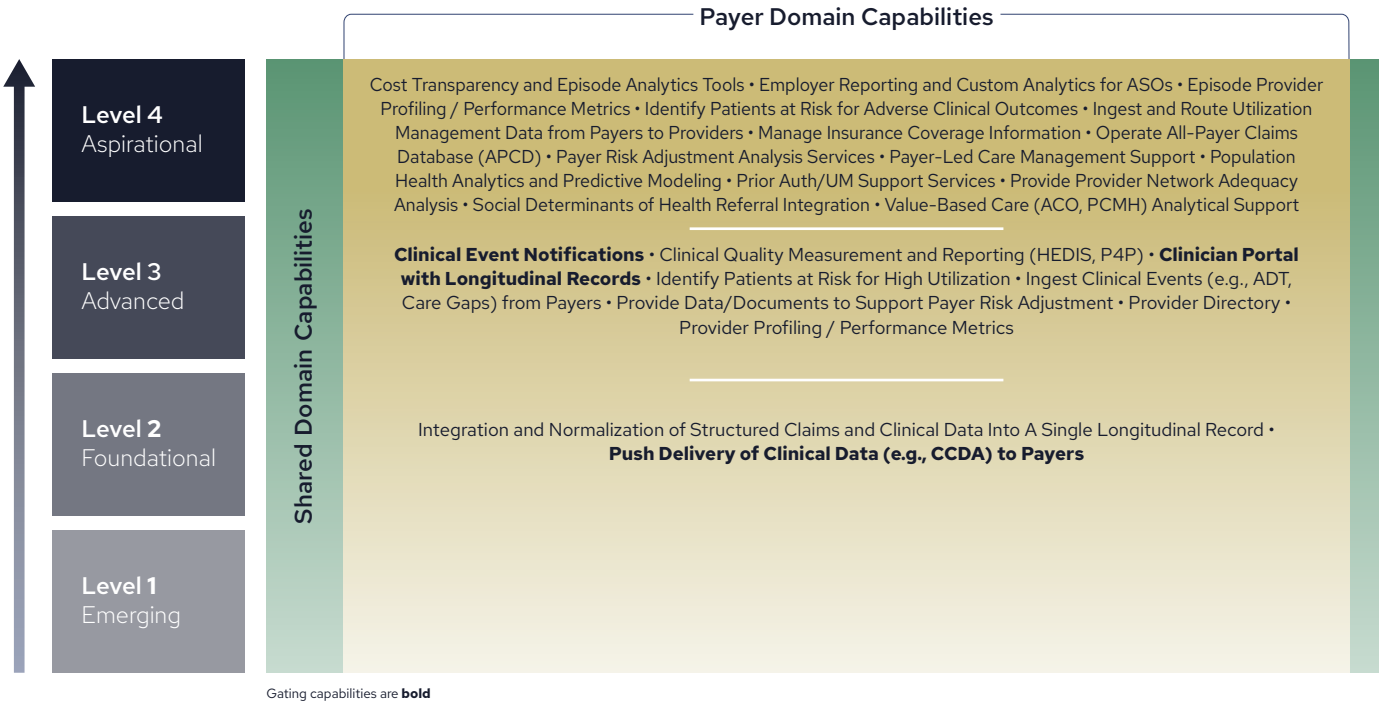

Figure 5. **Payer Domain Capabilities by Level**

Public Health Domain Capabilities

Through the Capability Model, public health agencies will gain a greater understanding of the level at which HDUs support early detection and response to public health threats, real-time disease surveillance and outbreak detection, and enhanced emergency preparedness and response.

Examples of public health domain capabilities include electronic lab reporting, electronic case reporting, syndromic surveillance, IIS data access and reporting, communications between public health and providers, and public health analytic reports to support national reporting, registry, and monitoring needs. Three of the 24 public health domain capabilities are gating capabilitie. An overview of public health domain capabilities is provided in Figure 6.

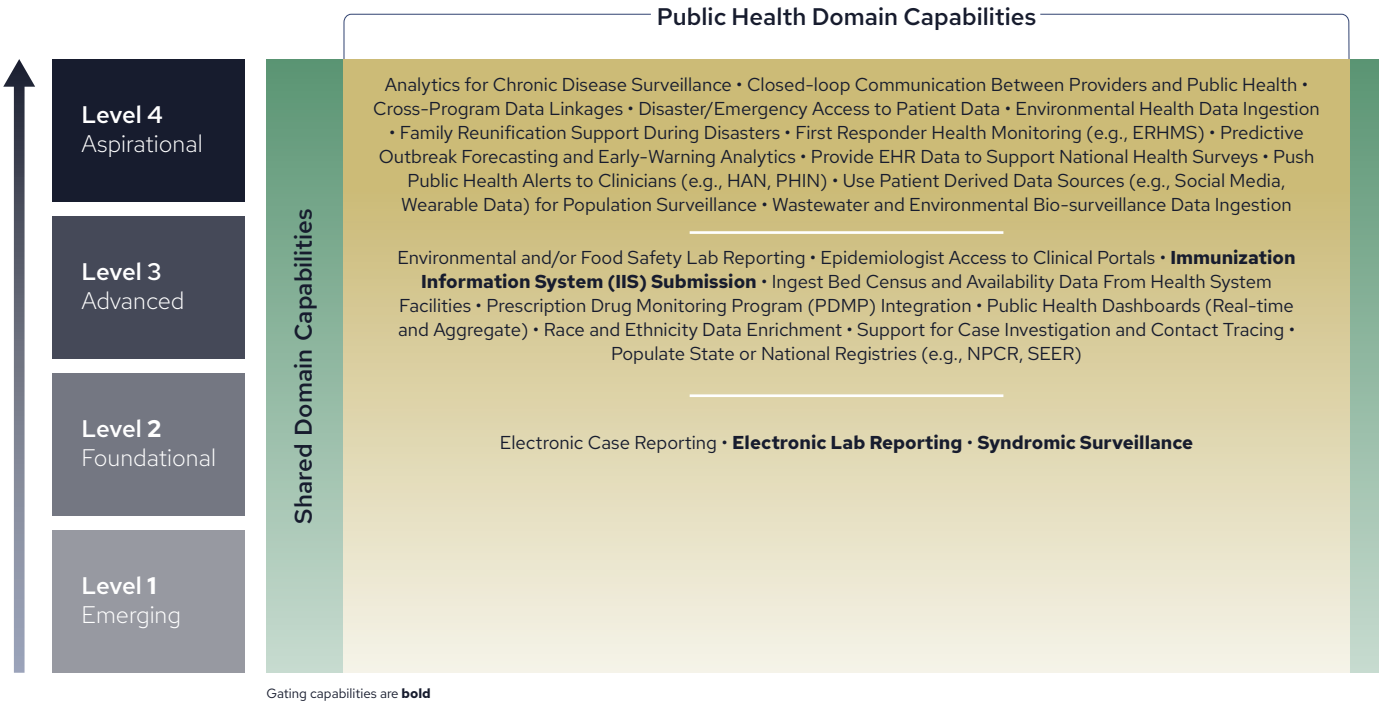

Figure 6. **Public Health Domain Capabilities by Level**

Researcher Domain Capabilities

Through the Capability Model, researchers will be able to understand the level at which HDUs support faster and more efficient clinical research, post-market monitoring, and enhanced collaboration across institutions and disciplines.

Examples of researcher domain capabilities include cohort discovery, formalized processes for reviewing and approving research uses of the data, descriptive summaries of the data available for research use, aggregating data into an OMOP/CDM or other instance, and consent management. Five of the 12 researcher domain capabilities are gating capabilities. An overview of researcher domain capabilities, stratified by level, contained in the Capability Model is provided in Figure 7.

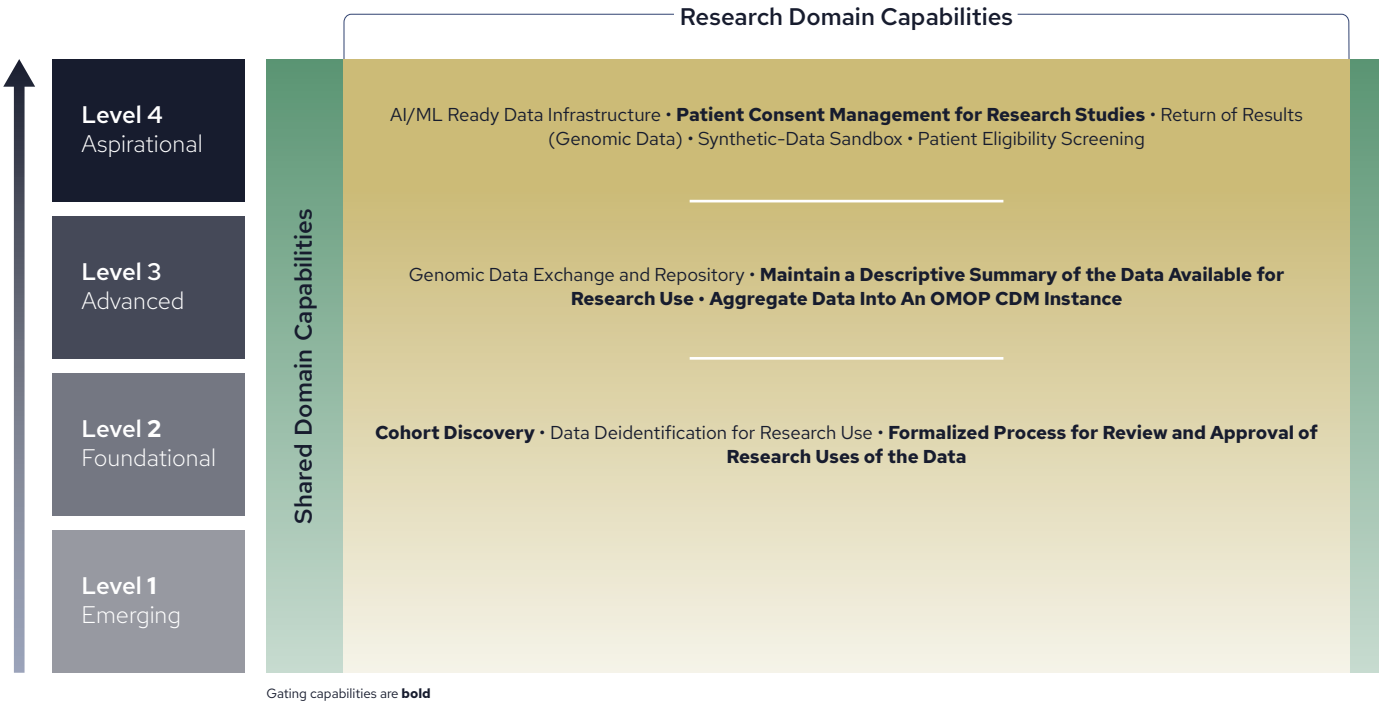

Figure 7. Researcher Domain Capabilities by Level

Patient Domain Capabilities

The Capability Model enables patients to understand the level at which HDUs support access to their health information, care coordination among their healthcare providers, and reduced administrative burdens.

Examples of patient access domain capabilities include patient portal services, such as direct access to longitudinal patient data or the transfer of patient data to a third-party provider of the patient's choice. Two of the five patient domain capabilities are gating capabilities. An overview of patient domain capabilities, stratified by level, contained in the Capability Model is provided in Figure 8.

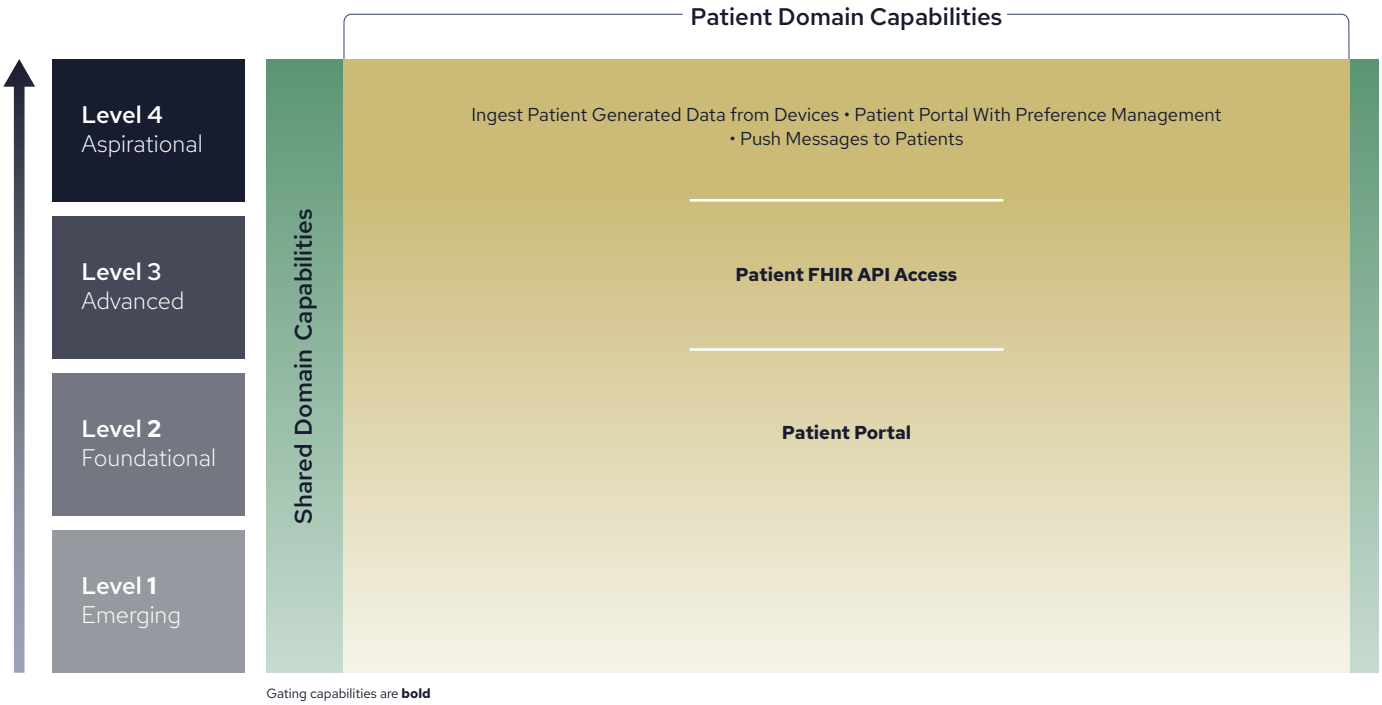

Figure 8. **Patient Domain Capabilities by Level**

Uses and Benefits for Stakeholders

The Capability Model is designed not only as a catalog of what HDUs could deliver, but also as a flexible assessment tool that stakeholders such as states, payers, or multi-stakeholder commissions can use to understand, transparently and objectively, an HDU's current level of capability.

Alternative Uses and Benefits of the Capability Model

Examples of ways that stakeholders can use the Capability Model are outlined below:

1. **Checklist for Minimum Expectations.** At the most basic level, the capabilities catalog can be used as a structured checklist. An organization may determine that "gate" capabilities are essential minimums — those that must be present before an HDU can be considered reliable. Other capabilities can then be reviewed to identify additional features that, while not mandatory, may be important for achieving policy priorities or programmatic goals. In this way, the catalog acts as a reference list, organized into logical categories to ensure no critical function is overlooked.

2. **Structured Gap Identification.** Beyond simply checking the presence or absence of capabilities, stakeholders can use the catalog to identify where existing HDUs fall short. For example, a state Medicaid agency might confirm that an HDU provides real-time ADT feeds but note gaps in the integration of social service data. This structured gap analysis enables targeted investment, technical assistance, or contractual requirements to close the gaps.

3. **Creating a Score or Index.** For organizations seeking a more quantitative and comparable measure, the model can be extended into a scoring framework. Borrowing from the scoring approach on page 9, each capability can be scored on a 0-3 scale reflecting the degree to which it is provided, weighted by importance to the stakeholder, and then rolled up into a normalized index from 0–100. Such a score provides a transparent way to compare HDUs, inform procurement or designation decisions, and monitor progress over time.

The Capability Model provides clear readiness signals through comparable indices and tier thresholds that inform designation, funding, and contracting decisions. It enables the creation of targeted road maps, translating identified gaps into actionable investments in people, processes, and technology, along with time-bound improvement plans.

The Capability Model offers several benefits, including improved comparability across HDUs and over time, sharper contracts and SLAs that support more transparent accountability, and alignment with emerging federal and state expectations without the need for duplicative audits. It also strengthens public trust through transparent governance and evidence-based assessment.

Once collected and verified, evidence can be reused to meet multiple policy and program requirements, reducing the overall reporting burden. HDUs can decompose their scores to identify the highest-leverage improvements for each audience, sequence investments, and forecast the impact of planned changes. Recognized validations, such as NCQA's Data Aggregator Validation, can be incorporated where appropriate to streamline quality reporting, reduce duplicative verification, and build trust in HDU-supplied data.

The model also supports risk management by establishing critical gates — such as privacy and consent protections or identity resolution requirements — that prevent over-reliance on the HDU before essential safeguards are in place.

At the same time, the model recognizes potential risks and provides mitigations. To address the

possibility of metric gaming, it calls for independent reviews and rotating sample audits. To avoid the pitfalls of a one-size-fits-all approach, it maintains domain-specific views and accounts for variations in capabilities. To manage the evidence burden, it encourages reusing artifacts across programs and setting reasonable recency windows, such as six to 12 months. Finally, to prevent equity blind spots, disaggregated reporting on coverage and completeness is required.

The Capability Model is procurement-ready, supporting the development of precise RFP clauses, SLAs, and measurement plans to reduce ambiguity in funding and designation processes. Finally, it is certification-capable, laying the groundwork for third-party review and future accreditation without constraining innovation.

Applying the Capability Model for Decision-Making

Practical application of the Capability Model involves translating index scores, gates, and floors into clear, actionable decisions across multiple stakeholder contexts. For state designation purposes, the model sets a high readiness bar to ensure only robust and reliable HDUs receive formal recognition. States might require a payer (Medicaid perspective) and public health advancement level of Advanced and a provider advancement level of Foundational. All required gates for those levels, particularly privacy and consent management, as well as identity resolution, must be passed. Visualizations such as radar charts showing the HDUs maturity level should be published alongside the designation, giving a transparent, visual depiction of strengths and areas needing improvement. This combination of numeric thresholds and gate requirements, along with visual evidence, creates both accountability and a road map for continuous improvement.

In the context of enterprise procurement for providers, the Capability Model helps organizations choose partners capable of supporting integrated clinical workflows and high-performance public health reporting. Providers should look for a public health advancement level of Advanced. If either domain falls to Foundational, the HDU should commit to a documented remediation plan designed to raise the score within two quarters. This way not only ensures high-functioning provider integrations and data quality but also creates a predictable cycle of targeted capability uplift that aligns with contractual and clinical priorities.

For Medicaid investment decisions, the Model's weighting features allow states to emphasize the capabilities most relevant to Medicaid and public health programs. By applying payer/Medicaid-specific weights, decision-makers can identify investments that yield the most significant improvement across both domains simultaneously. The reuse of evidence — such as SLAs, uptime logs, and API performance reports — further reduces administrative burden, enabling the same documentation to serve both program oversight and national policy alignment needs. This is particularly valuable in aligning APD/FFP requests, waiver deliverables, and health-related social need (HRSN) data exchange goals with tangible, evidence-backed improvements.

Finally, the model serves as a strategic planning tool for HIE and HDU operators themselves. By analyzing domain indices, stakeholder weights, and dependency maps, operators can select the highest-impact capabilities to improve over the next 12 months. These priorities should be sequenced to align with external policy milestones — such as CMS-Aligned Network recognition windows, Medicaid program deadlines, or public health reporting upgrades — ensuring that capability releases are both timely and market-relevant. Pre-collecting evidence for these targeted capabilities further streamlines the scoring and audit process, reducing delays and positioning the HDU as a ready, verifiable partner in funding, procurement, and national network alignment.

Across all these use cases, the Capability Model does more than measure readiness; it operationalizes improvement. By setting transparent thresholds, requiring concrete evidence, sequencing investments, and aligning with policy signals, it enables states, providers, payers, and operators to move from measurement to action with confidence and efficiency.

Evolution of Model and Methods for Development

Evolution From CSRI Maturity Model v1.0

CSRI released its initial Maturity Model v1.0 in April 2023. The initial Maturity Model emerged from a multi-stakeholder effort to create a shared language for evaluating state and regional HDUs and HIEs. It aimed to (1) catalog the essential functions HDUs ought to perform, (2) give policymakers and funders a way to discuss readiness, and (3) surface investment gaps after pandemic-era lessons about public health, equity, and cross-sector data use.

Maturity Model v1.0 organized the model across seven domains — governance and sustainability, participation and coverage, interoperability and data services, analytics and reporting, public health, payer/provider services, and research enablement — and applied a descriptive "maturity" lens in which activities and practices were grouped into largely narrative, self-reported levels. It sought to measure both breadth (the range of participating sources) and depth (the richness of exchanged content and the services built on it). The document was designed for internal self-assessment, board education, grant planning, and stakeholder dialogue and was not intended for certification.

Version 1.0 of the Maturity Model established a common vocabulary that could be used consistently across states and stakeholder groups, fostering more transparent communication and shared understanding. It also elevated governance and sustainability to first-class concerns, ensuring these critical aspects were considered alongside technology. In addition, the model offered a comprehensive inventory of HDU functions, giving new programs a valuable reference for scoping RFPs and developing road maps.

The initial model provided a valuable foundation but had several limitations that became clear in practice. It relied largely on self-attestation, with only limited direction on the types of evidence — such as SLAs, logs, or audits — or the recency of artifacts that should be used. This made it difficult to ensure comparability across organizations, since breadth, depth, and coverage were not consistently distinguished. In addition, the model did not yet differentiate stakeholder priorities, so activities were not weighted to reflect varying needs, such as those of public health agencies, provider workflows, or Medicaid programs. Finally, overlaps and redundancies among activities created challenges for applying the model to contracting or performance management. These observations, while expected for a first version, proved highly instructive: They directly informed the design of the Capability Model, which introduces clearer definitions, evidence requirements, normalized scoring, and stakeholder-specific weighting to support more consistent, transparent, and actionable assessments. Since v1.0, policy and market signals have increased the demand for verifiable, comparable readiness, as evidenced by broader API adoption, renewed public health modernization, and explicit federal expectations (e.g., alignment cues that emphasize clinical and claims data integration, patient/provider access, timeliness, and reliability). Stakeholders asked for a model that would be procurement-ready and support designation or certification paths.

The Capability Model shifts from listing descriptive activities to defining outcome-oriented, evidence-verifiable capabilities with clearly defined levels, ranging from Emerging to Aspirational. It introduces required gates — covering privacy and consent, identity, and security — that cap scores if unmet, ensuring critical prerequisites are in place. Stakeholder

weights and publishable indices, both by stakeholder or shared domain and in composite form, enable true apples-to-apples comparisons. To support consistent evaluation, the model provides evidence templates, including policies, SLAs, logs, and audits, along with recency expectations and confidence bands. It also offers policy crosswalks and procurement-ready artifacts, such as RFP language, SLAs, and metrics, to create clearer pathways toward future certification.

Methods for Development

The Capability Model was developed through a structured, phased approach. Initial planning and scoping confirmed the scope, deliverables, and success criteria; established governance via a steering committee and domain workgroups; set the working cadence; and assembled baseline materials from prior models and guidance.

Module development proceeded in waves to draft domain modules and produce initial capability lists aligned to a common specification. In parallel, the shared capabilities phase defined cross-cutting foundations — governance, identity, privacy and consent, data quality, APIs, sustainability, and equity — and identified gating capabilities whose absence would cap scoring. The model design defined the Capability Index, which includes stakeholder-specific and shared indices with normalization, floors, weights, and tier cutoffs. Validation and feedback included pilot scoring with multiple organizations, inter-rater reviews, and stakeholder sessions, resulting in refinements to definitions and levels after calibration. Finalization and formatting completed the package with edits, exhibits, appendices, policy crosswalks, and publication materials.

Feedback was gathered from multiple sources. Inputs included review of literature and standards, such as federal interoperability rules and guidance, the TEFCA framework, the U.S. Core Data for Interoperability (USCDI), FHIR/API implementation patterns, and public health reporting standards. CSRI and Civitas Networks for Health materials were carefully reviewed and integrated into the model, including the CSRI Maturity Model v1.0, along with supplemental documents and CSRI Board deliverables. This integration was informed by considerable input from Civitas Networks for Health, including results from previous surveys, supplemental materials, and discussions with their members and leaders. In addition, stakeholder input was gathered through review of published reports and structured interviews and review sessions with a diverse group of participants, including state leaders, public health officials, Medicaid representatives, payers, providers, ACOs, researchers, those representing patients, and HIEs.

Public Review

To further strengthen the model, CSRI and Civitas incorporated a structured public review process following the release of the draft Capability Model. After the model was introduced publicly through a webinar and related launch materials, CSRI opened a broad public comment period through December 12, 2025, inviting written feedback by email from interested stakeholders. That written review process was supplemented by two open listening sessions hosted by Civitas and CSRI on November 13, 2025, and December 3, 2025, respectively, to provide an additional forum for questions, discussion, and real-time feedback on the model's approach and priorities.

We received formal feedback from 31 unique contributors, including 10 HIE/HIO or state HIE authorities, 7 commercial/consulting organizations, 5 nonprofits/initiatives, 4 state/local public health authorities, 3 public-health membership associations, and 1 federal agency. Written feedback included 81 pages across 21 submissions, and the listening sessions produced 74 pages of transcript. These questions and comments were reviewed, categorized, and analyzed by CSRI staff. As a result, over 100 changes were made to the capability catalog, including deleting some capabilities and adding several others. Descriptions were improved for many capabilities and levels, weights, and categorizations were updated as well.

Next Steps

Plans for the Capability Model include creating a structured update process designed to keep the framework current, relevant, and responsive to stakeholder needs. Updates will follow a defined timing cycle, with regular reviews to incorporate emerging best practices, evolving policy requirements, and lessons learned from implementation. The process will also expand the model's scope by engaging additional stakeholders — such as behavioral health providers, long-term care organizations, community-based service networks, and technology vendors — to ensure a more comprehensive representation of the data-sharing ecosystem.

A key emphasis will be placed on advancing the evidence framework, which includes clearer expectations for the types and recency of artifacts, expanded definitions of key performance indicators (KPIs), and better alignment between metrics and stakeholder priorities.

This ongoing development will also focus on improving the model's scoring logic, weightings, and minimum thresholds, potentially leveraging aggregated results and community experiences to improve calibration, comparability, and fairness across diverse HDUs.

In parallel, the model's evolution will explore the feasibility of a formal accreditation program, establishing criteria, evidence requirements, and audit processes that could provide recognized accreditation for HDUs meeting the highest standards of capability, reliability, and governance.

By enhancing the evidence model, strengthening KPI integration, and refining the measurement tool over time, the Capability Model will remain a practical and policy-aligned tool for guiding investments, procurement, and performance improvement, while maintaining flexibility for future pathways toward formal certification when the community is ready.

Appendix I: Glossary

This glossary compiles domain-specific and less familiar terms used throughout the Guidebook.

45 CFR Part 2
Federal confidentiality regulations governing substance use disorder (SUD) treatment records. These rules impose stricter consent and redisclosure requirements than HIPAA, requiring explicit patient authorization before most disclosures.

Capability
An outcome-focused, evidence-backed function that an HDU provides at scale (e.g., statewide ADT notifications within defined timeliness and completeness thresholds).

Capability Index
A normalized 0-100 score representing an HDU's performance across weighted capabilities, produced for each stakeholder domain in composite form.

Capability Levels (Emerging/Foundational/Advanced/Aspirational)
Graduated descriptors that characterize increasing scope, reliability, and stakeholder readiness of a capability. These levels are applied to individual capabilities, as well as to an HDU based on meeting gating capabilities and index scores.

Capability Model
A structured framework that defines what health data utilities (HDUs) can reliably deliver, specifying outcome-oriented, evidence-verifiable functions that meet stakeholder needs.

Domains
High-level groupings that organize related capabilities into logical areas (e.g., Data Acquisition and Management, Engagement and Services, Advanced Use and Innovation, Core Infrastructure). Domains provide structure for comparing performance across different functional areas.

Evidence
Operational artifacts – such as SLAs, logs, audits, dashboards, or API catalogs – demonstrate that a capability is active and meeting defined thresholds.

Gates (Scoring)
Essential capabilities whose absence caps the overall maturity level attainable.

Health Data Utility (HDU)
a not-for-profit organization or state government entity with information exchange at its core and multi-stakeholder governance which, through its mission and function, seeks to meet the comprehensive health data delivery and analytics needs of a state's public and private sectors.

Ingestion
The process by which the HDU receives data, typically in a standard electronic format, validates it, transforms or normalizes it as needed, maps it to standard terminologies where applicable, and stores it in the HDU's data repository for subsequent use, exchange, analysis, or reporting.

Maturity Model
A descriptive framework that categorizes organizational development into stages of maturity. Unlike the Capability Model, which emphasizes evidence-backed delivery of outcomes, a maturity model typically highlights broad developmental phases or levels without prescribing detailed evidence or weighting.

Normalization (Index Scoring)
The process of adjusting capability scores to a standard 0-100 scale, ensuring comparability across stakeholders and domains.

Provider
Health care providers and provider organizations served by the HDU, including medical providers and organizations, as well as dental/oral health and vision/eye care providers, and other clinical provider types as applicable.

Stakeholder Weights
Relative importance values are applied when combining capability scores to create stakeholder-specific or composite indices.

Thresholds (Advancement Level Cutpoints)
Defined score ranges that categorize overall HDU capability levels.

Timeliness and Latency
Operational measures of how quickly data or alerts are delivered, often benchmarked by percentile targets (e.g., P95 latency).

Appendix II: Catalog of Capabilities

The full list of HDU Capability Model capabilities can be found here.

thecsri.org/HDUcapabilities

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About CSRI

Consortium for State and Regional Interoperability

The Consortium for State and Regional Interoperability (CSRI) is a collection of the nation's largest and most robust nonprofit health data networks. Collectively, our nonprofit organizations connect more than 100 million records for patients across several states and provide a wide range of services to healthcare organizations and local and statewide health agencies. For more information, visit **www.thecsri.org**.