FACILITY HIT ECOSYSTEM CAPABILITY MATURITY MODEL TOOLKIT

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Table of Contents

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- Joseph Amlung, MPH, Regenstrief Institute
- Dr. Theresa Cullen, MS, FAMIA, Indiana University and Regenstrief Institute
- Jan Flowers, MS, University of Washington
- Dr. Howard Hays, MSPH, FAAFP, Hays Health Informatics Consulting, LLC
- Jennifer Shivers, MFA, Regenstrief Institute

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1.0 Introduction

The Facility HIT Ecosystem Capability Maturity Model and Toolkit (ECMM) is a tool that can be used to assist healthcare facilities in developing capabilities that help support successful implementations of health information technology (HIT). It is designed to help initiate conversations about current maturity levels and assist the facility in prioritizing ways to work toward continuous improvement.

1.1 Toolkit Audience and Purpose

1.1.1 Intended Audience and Use

The principal audience for the Facility HIT Ecosystem Capability Maturity Model and Toolkit (ECMM) is a health facility that wants to mature its health information technology ecosystem. The model may be used in its current format or modified for the specific audience and use.

Maturity models can be useful in providing a mechanism to help identify opportunities for continuous improvement, development of a shared vision, prioritization of actions, and creation of an organizational action plan or roadmap.[1] The goal of this model is to stimulate conversation and facilitate the continuous improvement of HIT systems, including electronic health records (EHRs) and analytics, essential in providing quality care. This ECMM should be used to promote the support of best practices in patient care and identify risks and areas of issues. The model and toolkit are living documents, intended to be revised and re-evaluated as the organizational needs and maturity evolve and develop.

1.1.2 Value and Purpose

While a maturity model contains a continuum of levels, it should not be thought of as a grading scale, nor should it be used to compare facilities. A maturity model's value lies in its ability to help an organization facilitate a conversation about where it is with specific capabilities, and to document goals for prioritizing the continued improvement of those capabilities.

The ECMM is a valuable tool to:

- Enable a healthcare facility or organization to consider the institutional components that contribute to the successful use of HIT to improve patient care.
- Strengthen the HIT ecosystem with a model that promotes continuous learning and improvement by:
    - Providing self-assessments with pathways to advancing maturity.
    - Providing suggestions for interventions that advance the maturity of the system.

Note: The model is NOT about scoring or comparing facilities with each other, but should serve to ignite discussion and help plan a path toward strengthening the use of a system.

As with any model, an ECMM has limitations and may not fully or adequately represent all aspects of the larger system in which a health information system (HIT) resides. The intention is not to create a perfect model, but to create a tool that enables an organization to continuously improve.

Additional information about the history of maturity models and the development of this ECMM can be found in Appendix D.

2.0 HIT ECMM Model Structure

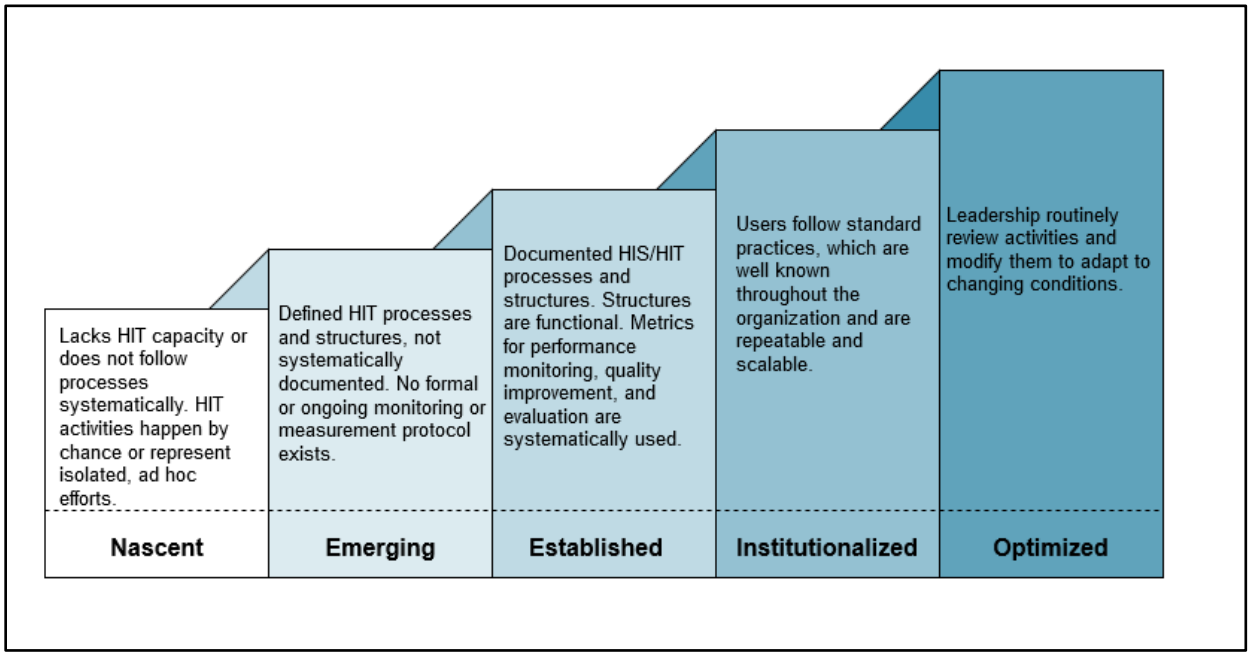
The ECMM is designed to examine and present the capabilities required to maintain the successful use and support of a healthcare facility's HIT. It does this through the use of cells describing a series of levels of maturity for each HIT capability subdomain. The following is an introduction to the ECMM Model.

2.1 Levels of Maturity

The maturity model has two main axes. The columns, comprising the first axis, represent the different levels of maturity. In the model, the first level is Nascent, where activities are primarily undeveloped or may not be occurring at all.[2] It is expected that existing organizations or facilities may already be at levels beyond the nascent level in some of their capabilities. The second level, Emerging, denotes capabilities or practices that are beginning to emerge, but are not yet formalized or standardized.[2] The third level, Established, denotes areas with activities that are defined and documented.[2] The fourth level, Institutionalized, is the level in which practices are standard and easily reproducible.[2] Finally, the highest level of maturity is Optimized, where all activities are defined, documented, standardized, reproducible, and routinely reviewed for improvements or adaptations to the environment.[2] These levels are further defined in Figure 2.1.1-1.

An individual facility's goal may not be to reach the Optimized level in every domain and subdomain. Facilities will need to determine their desired domain levels, and these goals may change over time. The levels are designed to form a maturity ladder where initiatives are implemented to sequentially mature the system. Because of the nature of the model, levels should be progressive; it is not intended for levels to be skipped. For example, to begin assessing maturity at the Institutionalized level, all criteria at the Established level should have been met.

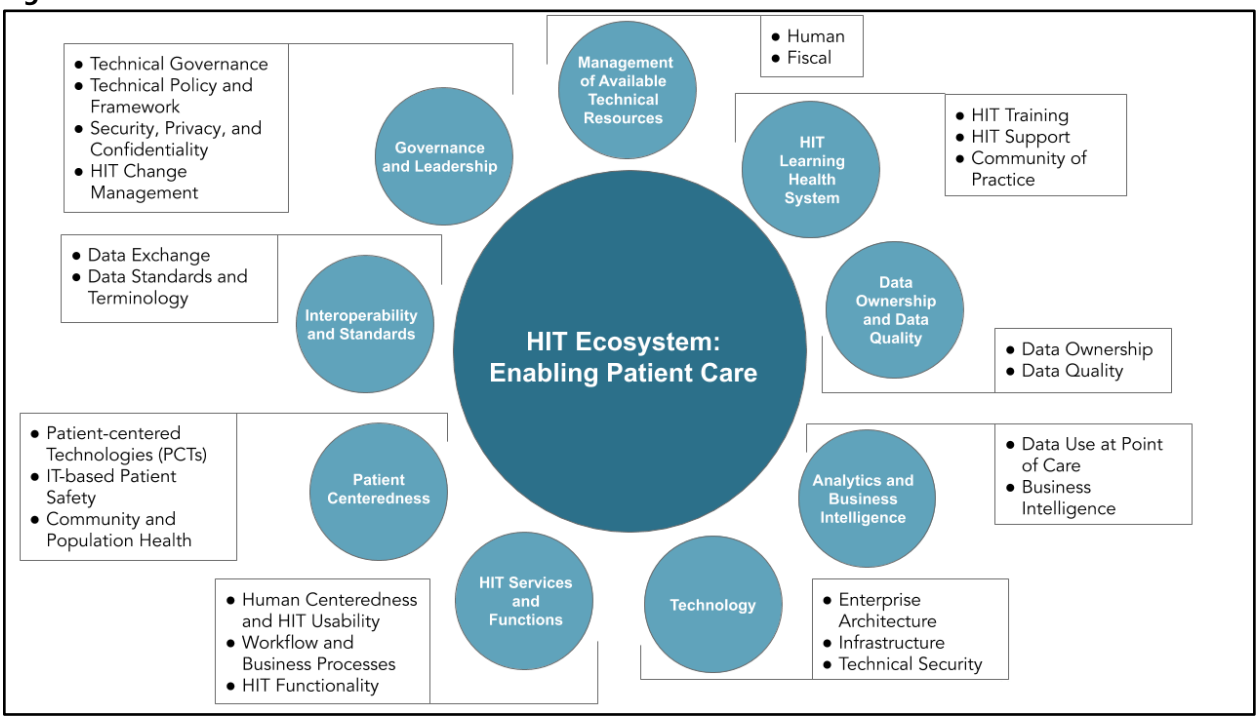
Figure 2.1.1-1 Levels of Maturity



2.2 Domains and Subdomains

The rows, comprising the second axis, contain the domains and subdomains for the ECMM. Figure 2.1.2-1 lists the domains in the circles and the subdomains in the bullets. Some domains and subdomains may overlap, since the capabilities required to support complex and interrelated healthcare business processes are often interconnected. Any overlap should not detract from the goals of the model. The goal is to improve patient care, and these domains will help to strengthen HIT to better support health worker's abilities to meet patient needs.

Figure 2.1.2-1 ECMM Domains and Subdomains



2.3 Organization and Facility

Each row of the model is further divided to display capability maturity descriptors at the organizational level and the local facility level. Each row contains cells with descriptions of the capabilities for a specific domain, level, or maturity. Since many health care providers are complex organizations with multiple components that must work together, the rows have been further divided into organization and facility maturity levels. Cooperation between these two levels is imperative for the organization to mature successfully. As part of a learning organization, facilities need to be able to provide their knowledge and input into the organizational level and vice versa.

O: Organization - Organization "O" rows contain maturity descriptions for facilities' parent organizations that support facilities, both directly (e.g., technical support) and indirectly (e.g., providing guidance and recommendations).

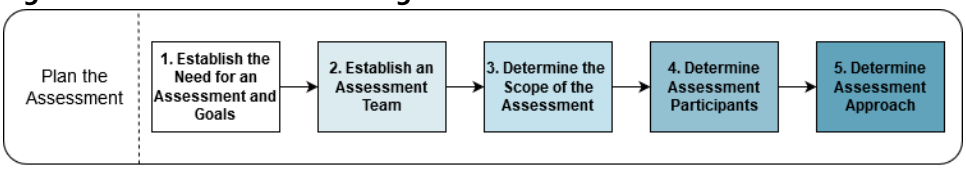
F: Facilities - Facility "F" rows contain maturity descriptions for individual healthcare facilities. The model was designed to refer specifically to health care facilities which are being assessed as independent entities that control healthcare processes within their respective facilities.

3.0 Maturity Assessment Process

A recommended process follows that can be tailored for each health facility as it progresses through an assessment. There are three high-level steps: the first step is planning the assessment, the second is conducting the assessment, and the final step is applying the information identified by the assessment.

3.1 Plan the Assessment

Figure 3.1-1 Assessment Planning



3.1.1 Establish the Need for an Assessment and Goals

The ECMM tool is designed to be used for a facility's continuous improvement. Once the facility documents what it hopes to achieve, the team can determine assessment goals.

Examples of goals might be:

- To determine which domains and subdomains to focus on over the next year.
- To measure maturity growth over a specified time period (e.g., yearly or biannually), and compare progress based upon a previous assessment.
- To assess areas where additional time and resources may be needed.
- To perform a broad assessment to determine opportunities for improvement or areas for growth.

Goals of this assessment should be documented in Worksheet 1 in Appendix A.

3.1.2 Establish an Assessment Team

Prior to conducting the assessment, the facility should establish a team or point person to organize and facilitate the assessment process. This team could be established using facility personnel, or with an external team, such as contractors. Various facility personnel should be consulted to reach consensus on the current state and establish goals and next steps.

The most valuable information gained from the ECMM is not the facility maturity level, but the resulting conversations and goals for improvement.

3.1.3 Determine the Scope of the Assessment

The team/point person next reviews the ECMM to determine which domains are most applicable to the assessment goals. Specific domains or all of the domains may be selected for assessment.

Use Worksheet 2 in Appendix A to check off domains and subdomains that will be assessed. Subdomain descriptions can be found in the HIT Ecosystem Capability Maturity Model in Appendix B.

3.1.4 Determine Assessment Participants

Once the assessment goals and scope are determined, identify individuals for involvement in the assessment process. Consider the following as potential examples of participants:

- People with knowledge about the HIT policies and practices at the facility
- Facility personnel in the facility who will be able to inform the specific domains selected for evaluation
- Leadership who can help establish goals and facilitate advancement toward facility maturity

Use Worksheet 2 in Appendix A to write down participant names who can contribute to the domains and subdomains that will be assessed.

3.1.5 Determine Assessment Approach

The assessment approach should be tailored to the facility's individual needs and circumstances. Consider the goals of the assessment, the scope, and the schedules of the desired participants. An approach that facilitates dialog and engages different perspectives is recommended. Two approaches for consideration are outlined below; however, a hybrid approach may work well in individual facilities.

Assessment Approach #1 — Assess Individually and Discuss Approach

Participants can perform individual preliminary assessments to discuss the differences between the domains and subdomains discovered from the assessments. Discussions can also be focused on specific goals to mature the facility. In this model, the following steps would be completed:

1. The assessment team selects individuals to assess specific domains/subdomains and asks them to complete their individual assessment by a specific date. For this approach to work, participants must review the same domain/subdomain.
2. Individuals selected to perform the assessment can utilize the model to evaluate the maturity level of each domain/subdomain they have been assigned. The participants should have the model with them as they determine the current facility capabilities, checking the appropriate box in the model which best describes the existing functionality.
3. The assessors then meet to discuss where specific domains/subdomains were noted to need improvement or where there are discrepancies in the assessment. The goal is not to be "right" or "wrong" about the maturity level, but to work collaboratively to identify opportunities for improvement.

Assessment Approach #2 — Interview Approach

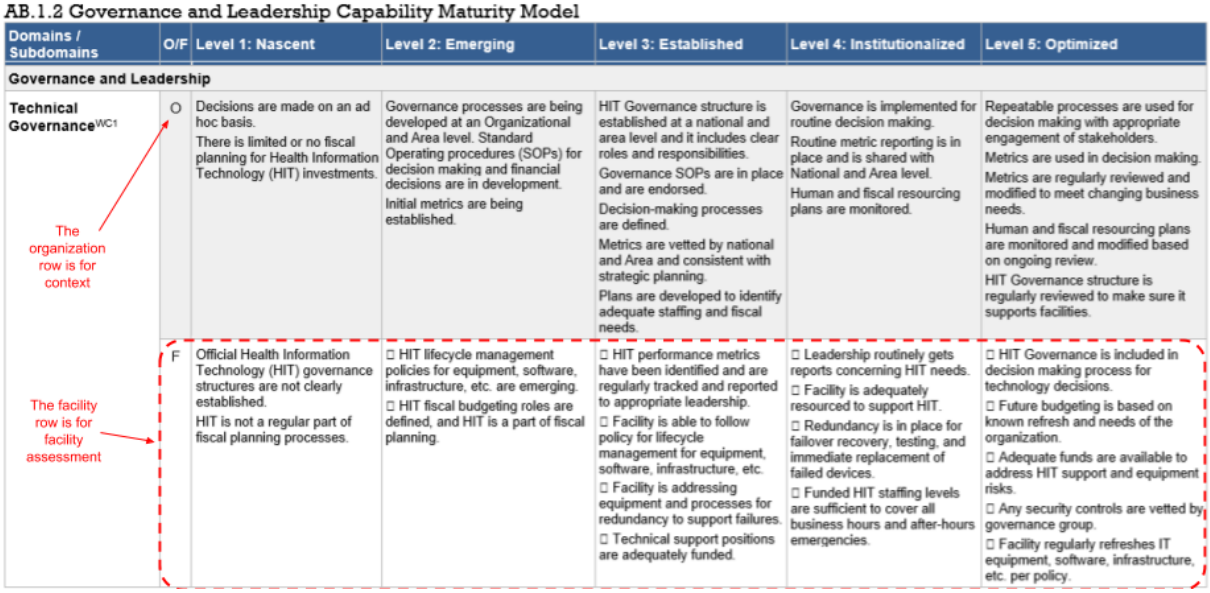
In the interview assessment approach, the assessment team gathers information from appropriate personnel using a conversational approach following the steps below.

1. For each domain/subdomain in the scope of the assessment, the assessment team selects individuals to interview.
2. The team schedules or plans the interview session(s) for each domain/subdomain in the scope of the assessment. Based upon the personnel involved, some domains may be able to be assessed together.
3. Interview(s) are conducted for a specific domain/subdomain. The team should have the model in front of them. As a team, they should move through each domain/subdomain to be assessed in the session and have conversations about the current level of capability. This is performed by determining the capabilities currently available to the facility, subsequently checking off the box in the model which best describes the existing functionality.

3.2 Performing the Assessment

To perform the assessment, the assessors will use the ECMM in Appendix B. The facility will focus on the domains and subdomains that have been selected for the assessment. For each subdomain that will be assessed, the facility will focus on the Facility row, which is designated by an "F" for that domain. The facility assessment team can see the Organization row for context on how the organization and facility might need to work together to improve the capabilities.

Figure 3.2-1 Determining the Domain/Subdomain Level



Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Governance and Leadership						
Technical GovernanceWC1	O	Decisions are made on an ad hoc basis. There is limited or no fiscal planning for Health Information Technology (HIT) investments.	Governance processes are being developed at an Organizational and Area level. Standard Operating procedures (SOPs) for decision making and financial decisions are in development. Initial metrics are being established.	HIT Governance structure is established at a national and area level and it includes clear roles and responsibilities. Governance SOPs are in place and are endorsed. Decision-making processes are defined. Metrics are vetted by national and Area and consistent with strategic planning. Plans are developed to identify adequate staffing and fiscal needs.	Governance is implemented for routine decision making. Routine metric reporting is in place and is shared with National and Area level. Human and fiscal resourcing plans are monitored.	Repeatable processes are used for decision making with appropriate engagement of stakeholders. Metrics are used in decision making. Metrics are regularly reviewed and modified to meet changing business needs. Human and fiscal resourcing plans are monitored and modified based on ongoing review. HIT Governance structure is regularly reviewed to make sure it supports facilities.
	F	Official Health Information Technology (HIT) governance structures are not clearly established. HIT is not a regular part of fiscal planning processes.	☐ HIT lifecycle management policies for equipment, software, infrastructure, etc. are emerging. ☐ HIT fiscal budgeting roles are defined, and HIT is a part of fiscal planning.	☐ HIT performance metrics have been identified and are regularly tracked and reported to appropriate leadership. ☐ Facility is able to follow policy for lifecycle management for equipment, software, infrastructure, etc. ☐ Facility is addressing equipment and processes for redundancy to support failures. ☐ Technical support positions are adequately funded.	☐ Leadership routinely gets reports concerning HIT needs. ☐ Facility is adequately resourced to support HIT. ☐ Redundancy is in place for failover recovery, testing, and immediate replacement of failed devices. ☐ Funded HIT staffing levels are sufficient to cover all business hours and after-hours emergencies.	☐ HIT Governance is included in decision making process for technology decisions. ☐ Future budgeting is based on known refresh and needs of the organization. ☐ Adequate funds are available to address HIT support and equipment risks. ☐ Any security controls are vetted by governance group. ☐ Facility regularly refreshes IT equipment, software, infrastructure, etc. per policy.

The best way to determine which level describes the facility domain/subdomain is to look first at the Nascent box. For this model, "nascent" describes a capability or function which does not currently exist in the system. If the facility does not have this capability or function in place, the Nascent box should be circled or highlighted. If the facility is already taking steps to introduce this functionality, or said functionality is already in place, the participant should move to the next level. The individual should continue reading through the subdomain's levels until the level is reached that best describes that particular facility's capabilities. This step is repeated for each assessed domain/subdomain. An example assessment can be found in Appendix C.

3.3 Using the Assessment Results

While the tool is helpful for determining maturity level, the overarching goal is to establish paths forward that will facilitate continued advancement. The assessment team will need to decide how to leverage opportunities identified during the process and to set goals and plan for next steps. It may be helpful to set maturity level targets for a defined period or consider

the assessment findings in existing facility planning processes. The model will change and evolve to mirror the system it is representing; therefore, the evaluation team should revise the model as appropriate.

Appendix A – HIT ECMM Worksheets

The following worksheets may be used to facilitate the ECMM model assessment goals, scope and planning.

Worksheet 1: Assessment Goals

Assessment Goals
1.
2.
3.

Worksheet 2: Domains and Participants

1. Select specific domains/subdomains to be assessed and check the boxes next to the selected domains.
2. For selected domains/subdomains, list one or more participants who will be able to contribute to the assessment.

Domain	Subdomain	Participants
❑ **Governance and Leadership**	❑ Technical Governance	
	❑ Technical Policy and Framework	
	❑ Security, Privacy, and Confidentiality	
	❑ HIT Change Management	
❑ **Technology**	❑ Enterprise Architecture	
	❑ Infrastructure	
	❑ Technical Security	
❑ **Interoperability**	❑ Data Exchange	
	❑ Data Standards and Terminology	
❑ **Patient Centeredness**	❑ Patient-Centered Technologies (PCTs)	
	❑ IT-Based Patient Safety	
	❑ Community and Population Health	
❑ **Management of Technical Resources**	❑ Human	
	❑ Fiscal	

Domain	Subdomain	Participants
❑ **HIT Services and Functions**	❑ Human Centeredness and HIT Usability	
	❑ Workflow and Business Processes	
	❑ HIT Functionality	
❑ **Data Ownership and Data Quality**	❑ Data Ownership	
	❑ Data Quality	
❑ **Analytics and Business Intelligence**	❑ Data Use at Point of Care	
	❑ Business Intelligence	
❑ **HIT Learning Health System**	❑ HIT Training	
	❑ HIT Support	
	❑ Community of Practice	

Appendix B – HIT Ecosystem Capability Maturity Model

Each domain in the maturity model is addressed in the sections below. The descriptions of the subdomains are followed by the maturity model for that domain. Other models and information sources were referenced in the creation of this model; these can be found in the Works Consulted list.

Note: In the maturity model tables, "O" indicates an organizational-level domain or subdomain; "F" indicates a facility-level domain or subdomain.

AB.1 Governance and Leadership

AB.1.1 Subdomain Definitions

Domain	Subdomain	Description
Governance and Leadership	Technical Governance	A structured body with authority over organizational structure, decision making, and coordinating responsibility to empower technical leaders in the HIT ecosystem
	Technical Policy and Framework	A framework and the documents (policies, strategies, and guidance) that guide the management and use of HIT.
	Security, Privacy, and Confidentiality	Policies and practices to support data security, confidentiality, and privacy for patient data and other sensitive data types as required by law and good data practices.
	HIT Change Management	A controlled process for requesting, prioritizing, testing, verifying and implementing changes within a computer system, infrastructure or HIT processes around technology.

AB.1.2 Governance and Leadership Capability Maturity Model

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Governance and Leadership						
Technical Governance[WC1]	O	Decisions are made on an ad hoc basis. There is limited or no fiscal planning for Health Information Technology (HIT) investments.	Governance processes are being developed at an Organizational level. Standard Operating procedures (SOPs) for decision making and financial decisions are in development. Initial metrics are being established.	HIT Governance structure is established at an organizational level and it includes clear roles and responsibilities. Governance SOPs are in place and are endorsed. Decision-making processes are defined. Metrics are vetted by appropriate stakeholders and consistent with strategic planning. Plans are developed to identify adequate staffing and fiscal needs.	Governance is implemented for routine decision making. Routine metric reporting is in place and is shared with appropriate stakeholders. Human and fiscal resourcing plans are monitored.	Repeatable processes are used for decision making with appropriate engagement of stakeholders. Metrics are used in decision making. Metrics are regularly reviewed and modified to meet changing business needs. Human and fiscal resourcing plans are monitored and modified based on ongoing review. HIT Governance structure is regularly reviewed to make sure it supports facilities.
	F	Official Health Information Technology (HIT) governance structures are not clearly established. HIT is not a regular part of fiscal planning processes.	□ HIT lifecycle management policies for equipment, software, infrastructure, etc. are emerging. □ HIT fiscal budgeting roles are defined, and HIT is a part of fiscal planning.	□ HIT performance metrics have been identified and are regularly tracked and reported to appropriate leadership. □ Facility is able to follow policies for lifecycle management for equipment, software, infrastructure, etc. □ Facility is establishing processes for redundancy to support failures and planning for necessary equipment. □ Technical support positions are adequately funded.	□ Leadership routinely gets reports concerning HIT needs. □ Facility is adequately resourced to support HIT. □ Redundancy is in place for failover recovery, testing, and immediate replacement of failed devices. □ Funded HIT staffing levels are sufficient to cover all business hours and after-hours emergencies.	□ HIT Governance is included in decision making process for technology decisions. □ HIT budgeting is based on the up-to-date needs of the organization. □ Adequate funds are available to address HIT support and equipment risks. □ Any security controls are vetted by governance group. □ Facility regularly refreshes IT equipment, software, infrastructure, etc. per policy.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Technical Policy and Framework	O	Policies may or may not exist; those that exist are IT focused/not Electronic Medical Record - Health Information Technology (EMR-HIT) focused. Users are unaware of existing policies. No monitoring/compliance framework is in place. Any policies that exist are not evidence-based/best practice based.	An overall monitoring/compliance framework is emerging and policies (i.e. data standards, interoperability, HIT use, privacy/security/confidentiality , infrastructure, data ownership and quality, and data use agreements) are being drafted. There is an action plan in place to prioritize and address any policy gaps. Facilities are providing input to the compliance framework and policies.	A comprehensive HIT portfolio of policies is established and shared with facilities. Basic monitoring/compliance is in place. Facilities are able to locate and access policies and processes established at the organization-level. Users are trained on the policies as a part of the core HIT training that they receive. Facilities are able to reach out to the organization level for support of policy implementation.	Portfolio of policies is governed by an organized body (i.e. data standards, interoperability, HIT use, privacy/security/ confidentiality, infrastructure, data ownership and quality, and data use agreements). There is an established change management process for policy development, maintenance, and training. Compliance framework is comprehensive, measurable, and actionable, and timely action is taken to improve compliance.	Policies are reviewed regularly by the governing body. Policies are updated to reflect best practices and standards and changing HIT ecosystem in terms of new clinical practices and technology. Portfolio is used to guide strategic planning.
	F	Each facility is operating within their own understanding of best practices and Standard Operating Procedures (SOPs). There may be some ad hoc infusion of organization-level policy at a facility. Facility has no or limited use of organization-level planning, compliance, or assessment tools.	□ Facility is aware of the organization-level policies. □ Coordination with the organization level is beginning to emerge. □ Facility policy needs are being identified, and there is an action plan to address needs.	□ Comprehensive HIT portfolio of policies is established. □ Facility knows the specific organization-level location to gather policy information, guidance and support for application at the facility. □ Any gaps in organizational policies are filled in by the facility for their own use. □ Identified technology and/or policy gaps are shared with the organization.	□ Facility follows the compliance program and monitors and enforces user compliance. □ Facility provides input to the organization's best practices and policies.	□ Facility has an equal voice in informing policies and updates as needs and context change at the facility.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Security, Privacy, and Confidentiality WC1, WC3, WC4, WC5	O	Policies for privacy, security, and confidentiality are missing, outdated, or have not been shared with the facilities.	Regulations and/or legislation that apply to privacy, security, or confidentiality while capturing, storing, or using clinical and health data are identified and interpreted. Policies and processes to support and enforce compliance are drafted at the facility or organization level. System and process security, privacy, and confidentiality requirements are identified. Training is being planned.	Organizational policies to support compliance are rolled out to facilities. There are processes in place for handling breaches. Training is available and participation is tracked.	Communication processes are in place to communicate changes in security, privacy, and confidentiality expectations. There are processes in place to proactively monitor regulation and legislation practices to ensure compliance is maintained. Employees understand that everyone is responsible for compliance.	There are processes in place to review a system (technology and processes) on a regular basis to ensure compliance. There are processes in place to evaluate compliance when selecting, building, or configuring software, and establishing business processes and procedures that will be used with that software.
	F	Facility policies for privacy, security, and confidentiality are missing or outdated. Training for security, privacy, and confidentiality is nonexistent or ad hoc. Oversight roles are not yet identified.	□ Local regulations and/or legislation that applies to privacy, security, and confidentiality while capturing, storing, or using clinical and health data have been identified and interpreted. □ The oversight role is identified. □ Facility has evaluated organizational policies, procedures and training and has identified any gaps in meeting local requirements. □ Any gaps in meeting privacy, security and confidentiality are prioritized and being addressed.	□ Each system and its processes and procedures are evaluated by facility as appropriate to assess risk and identify and prioritize system and process remediation. □ Facility knows the specific organization-level location to gather policy information, guidance and support for application at the facility. □ There is a compliance training plan, and employees are being trained. □ Training compliance is being tracked.	□ Policies to support and enforce compliance are implemented at the facility. □ Remediation plans as needed are in place and are being executed. □ Facility provides input to the organization's best practices and policies.	□ There are processes in place to review a system (technology and processes) on a regular basis to ensure compliance. □ When implementing new software or technology, there are processes in place to evaluate compliance and establish business processes and procedures.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
HIT Change Management WC2	O	There is little or no applied organization-level HIT change management. Decisions about Health Information Technology (HIT) changes are made in silos and are ad hoc or people-dependent. There is limited or no organization-level planning of HIT ecosystem as a whole.	HIT change management processes are being drafted with input from facilities.	Organization-level HIT change management approach is identified and published for use. Appropriate support and materials are provided to facilities for ongoing change management training. The facility's role in the change management process is clearly defined. Projects/programs know of the change management process and comply.	Change management approach is organization-wide, mandated, and monitored. Change management initiative issues are formally tracked, and root causes are identified. Competency in the process is seen across the organization.	Change management process is reviewed regularly by those in charge of governance. Change management process is updated from a bi-directional feedback loop with the stakeholders and participants of the process and issue tracking and resolution. Compliance and incidences are tracked and monitored. There are processes in place to review any change management issues and strengthen process based upon learning.
	F	Decisions regarding Health Information Technology (HIT) are made at a facility level with limited or no communication with the organization-level. Facility is unique in how they handle changes to HIT upgrades, processes, and/or policies.	□ The facility is evaluating unique change management issues or technology and establishing a plan to meet those needs. □ There is awareness of guidance from the organization-level on how to manage change. □ Facility is providing input to organization-level change management processes. □ Facility references organizational change management recommendations when developing change management practices.	□ Facility change management practices are in place. □ Change management adoption and adherence is monitored at the facility-level.	□ The facility fully complies with the organization-level change management program. □ The facility enforces compliance. □ Bi-directional communication with organization-level exists and is used for input into change management process. □ The facility communicates with organizational-level to receive support and materials.	□ Change management process is reviewed on a regular schedule. □ Compliance and incidences are tracked and monitored.

AB.2 Technology

AB.2.1 Technology Subdomain Definitions

Domain	Subdomain	Description
Technology	Enterprise Architecture	A framework and a set of guidelines that provide a foundation for selecting and building new technical business capabilities.
	Infrastructure	The collection of hardware, software, networks, data centers, facilities and related equipment used to develop, test, operate, monitor, manage and/or support information technology services.
	Technical Security	Practices to protect patient and sensitive data in a way that addresses compliance and institutes a proactive and risk-based approach to securing technology.

AB.2.2 Technology ECMM

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Technology[WC3]						
Enterprise Architecture (EA)[WC1]	O	Architectural components and integration between them and outside systems are organized in an ad hoc or informal manner in the absence of a Health System Architecture plan for the organization.	A draft organizational-level Health System Architecture for systems and technologies defining architectural components and the integrations between them and with outside systems exists. The desired components are outlined and defined.	The Health System Architecture has been documented, approved and shared. There is a plan for filling any functional gaps. Coordination between organizational leadership and EA consultants occurs.	There are processes in place to conduct architecture reviews for new health software. These processes are currently in compliance with EA guidelines.	There are processes in place to ensure review of architecture documentation and decisions to ensure that they are aligned with and meeting health system needs. There are processes to ensure that individual facility projects are aligned with the organizational enterprise architecture. Adherence to HHS EA Guidance is routinely evaluated.
	F	Architectural components and integration between them and outside systems are organized in an ad hoc or informal manner in the absence of a Health System Architecture plan for each facility.	□ Any functional gaps between the enterprise and the local facility needs have been identified. □ The facility's unique architectural components (if any) are defined, and it is clear how they fit into the organization's architecture.	□ A Health Facility Architecture has been documented and approved. □ There is a plan for addressing the facility's identified gaps.	□ There are facility processes in place to conduct architecture reviews for new health software. □ The reviews are documented and shared with area programs.	□ There are processes in place to ensure review of architecture documentation and decisions to ensure that they are aligned with and meeting health system needs. □ There are processes to ensure that individual facility projects are aligned with the organizational enterprise architecture.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Infrastructure	O	There is an ad hoc or reactive approach to meeting infrastructure needs.	An infrastructure needs assessment is done. At an organization level, recommendations for supporting the base system capabilities are drafted. A process for tracking and reporting organizational infrastructure issues is drafted.	Base recommendations for supporting volume and types of transactions are documented and shared. Recommendations to help facilities estimate needs for internet capacity, technical security measures, and hardware that can support the core functionality and health data exchange are established and shared.	A routine review of system needs and a technology review and refresh cycle are established. There is a process in place to identify, prioritize and fill HIT gaps. The refresh cycle is reviewed routinely including costing data, and information is included in the budget and planning cycle.	There is a process in place to update and review infrastructure needs and assess needs on a regular basis. There is a technical ability to forecast needs.
	F	The infrastructure is not able to support the facility's current needs, or there are gaps in supporting the health system needs.	□ A facility-level infrastructure assessment has been done to determine the facility's needs and assess gaps. □ The facility has a process and plan in place to prioritize and fill infrastructure gaps. □ A process for tracking and reporting infrastructure issues is drafted.	□ There is a process in place to track and report issues with infrastructure. □ Business continuity plans are in place to support recovery and essential business practices during an outage or disaster.	□ There is a process in place to identify, prioritize and fill gaps. □ There are processes in place to determine if backup hardware / infrastructure is needed. □ Required backup technologies are in place. □ The process to move to the backup is documented and tested.	□ The processes are in place to update and review infrastructure needs, issues / outages and risks on a regular basis.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Technical Security[WC3] WC4 WC5	O	Employees may not be aware of or are unclear regarding their role in technical security.	Security regulations that apply to patient-level data have been identified and documented. The organization is considering industry best practices for identifying and addressing security needs and vulnerabilities. Policies and best practices are drafted. Experts are appropriately engaged by the organization to help assess current state of technical security.	Policies and best practices are approved and communicated to facilities. Physical security, asset management, patch management, and firewalls are in place to manage organizational security. Recommendations and policies for facility security are in place.	There is a repeatable technical security training course for employees to take on a regular basis. There are tools and resources for facilities to use to assist in following best practices. Processes for incident management are in place.	Security practices are a part of the culture. There are processes and tools in place to detect breaches and identify threats. There are processes in place to review incidents and risks on a regular basis and adjustments to policies, processes, and technology are made based upon review findings.
	F	Facility employees may not be aware of or are unclear regarding their role in technical security. Security may be happening as a result of one or two employee's work.	□ State and local laws that are applicable to the systems of health and patient-level data are known. □ The facility has conducted a security assessment and has created risk-based prioritized action plans. □ Policies and best practices are drafted. □ Processes for proactive security assessment, patch testing, and management are drafted. □ The team is considering industry best practices.	□ Facility-level practices include a layered approach that addresses security aspects such as physical security, asset inventory, patch management, and firewalls. □ All employees have been trained to understand their role in securing information assets. □ All employees are aware of security breach reporting obligations and processes. □ Facility is following organizational policies and practices. □ Incident vulnerability management and tracking is in place.	□ Employee training is required on a regular basis and compliance is tracked and enforced. □ Security assessments happen on a regular basis. □ Action plans are being addressed. □ The security team regularly reviews industry incidents and learns from them.	□ All employees are aware of their role in securing data and patient records. □ Security practices are a part of the culture. □ Processes for incident management are in place. □ There are processes and tools in place to detect breaches and identify threats. □ There are processes in place to review incidents and risks on a regular basis, and adjustments to policies, processes, and technology are made based upon review findings.

AB.3 Interoperability and Standards

AB.3.1 Interoperability and Standards Subdomain Definitions

Domain	Subdomain	Description
Interoperability	Data Exchange	Data exchange includes the capability for sharing data that is required to support situations, such as patient referrals and transfers, with external partners (outside facilities and organizations). It also includes the ability to get data from lab equipment into the electronic medical record and sharing necessary patient health data between different departments such as the pharmacy, in-patient services, and out-patient services.
	Data Standards and Terminology	The use of terminology and data standards to support semantic interoperability (use of standardized vocabularies such as LOINC, ICD-10, or RxNorm) of data as it is exchanged between systems and organizations.

AB.3.2 Interoperability and Standards ECMM

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Interoperability and Standards						
Data Exchange[WC1]	O	There are limited policies, tools, and practices established for internal and/or external data exchange. The technical systems have no or limited support of standard data exchange.	Internal connectivity needs between systems, subsystems, and lab equipment are assessed, and there is an action plan for addressing gaps. There are templates for external partner data sharing agreements. Processes for data sharing with applicable lab equipment/ medical devices and data sharing between departments are documented. Data exchange processes and formats for internal and external sharing needs are identified and documented.	The processes for external data exchange are disseminated to facilities. There are concrete, early examples of standards-based data exchange within the environment. There is an organizational data sharing architecture in place. The technical systems support data exchange via message standards.	There are processes in place to evaluate if and how system upgrades and changes impact data sharing. Fully meets the standards for data exchange, such as those set by Office of the National Coordinator for Health IT (ONC) and the Centers for Medicare and Medicaid Services (CMS).	State-based exchanges for different domains are established and in place. Passive reconciliation of clinical data is in place within the Health Information Technology (HIT). There are processes in place to review compliance with data sharing agreements. There are processes in place to regularly review data exchange process documentation, data sharing agreement templates, and guidance for facilities.
	F	Facility has limited or one-off data exchange capabilities. Data exchange is not using established data exchange standards and processes. There are no or limited policies, tools, and practices established for external data exchange. There are gaps in the integration between internal systems and external systems limiting holistic support of patient care.	□ Facilities have determined the external partners with whom they need to exchange data and prioritized the needs. □ Data exchange formats for internal and external sharing needs have been identified and documented. □ Internal connectivity needs between systems, sub systems, and lab equipment have been assessed. □ Internal connectivity needs between systems, sub systems, and lab equipment have been documented.	□ Appropriate data use / data sharing agreements are in place. □ Exchange with prioritized external partners / Health Information Exchange (HIE) is established. □ Internal systems are fully integrated for data sharing. □ Bidirectional data sharing between external labs and other registries occurs. □ There is a place for integration specialists to share best practices and documentation with each other.	□ Facility has processes to evaluate how any local system configuration changes impact data sharing. □ Sharing agreements are reviewed on a regular basis.	□ Facility fully meets standards for data exchange, such as those set by Office of the National Coordinator for Health IT (ONC) and the Centers for Medicare and Medicaid Services (CMS). □ An approach to HIE is established. □ HIE is supported by a technological solution. □ State-based exchange for different domains is established and in place. □ Passive reconciliation of clinical data is in place within the Health Information Technology (HIT).

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Data Standards and Terminology[WC1]	O	There are no organizational metadata standard recommendations. Facilities are left on their own to determine metadata standards and coding practices.	Domains that require metadata standards are being identified. Metadata standards for inclusion in the Health Information Technology (HIT) system are drafted.	Metadata standards are formally endorsed and supported within the HIT system. Metadata standards are published and available at the central level with version control. Versioning processes are in place where applicable. Facilities are aware of the standards. Facilities have access to retrieve standards through standards-based Application Programming Interfaces (APIs). HIT systems support metadata standards.	Metadata standards are being used throughout the enterprise. Metadata standards are updated at the central level. There are recommendations on quality practices for coding and reviewing coding of terms. There is a process in place to request changes and additions to centrally used terminology.	Organization is actively updating standards through updating mapping applications. Organization is actively updating standards by checking for quality and consistency on a regular basis. Terminologist is available.
	F	The practice of using metadata standards may not be applied consistently across the facility and may not have a governance process in place.	□ Metadata management subject matter experts are identified. □ The facility is aware of data standards and planning to ensure compliance with any organizational standards.	□ There are standard practices for use and coding of medical terms. □ Facility has implemented the recommended terminology standards and domains.	□ There are processes and procedures in place for metadata updates. □ Facility personnel are trained and aware of metadata standards.	□ The facility has governance processes in place to curate and manage any local standards. □ There is a process in place for reviewing and actively updating standards on a regular basis. □ There are quality checking processes in place for actively managing quality and coding consistency.

AB.4 Patient Centeredness

AB.4.1 Patient Centeredness Subdomain Definitions

Domain	Subdomain	Description
Patient Centeredness	Patient-centered Technologies (PCTs)	Technologies or systems that enable a patient to take an active role in their health and partner with practitioners to ensure that their health needs are being met. An example of this is a patient portal.
	IT-Based Patient Safety	HIT implementation can affect patient safety if certain requirements are not met. HealthIT.gov lays out requirements in SAFER guides that also allow for self-assessment of HIT implementation as it relates to patient safety.
	Community and Population Health	The goal of Population health management is to improve the health of a defined patient population. It focuses on a proactive approach to healthcare. HIT should enable Community and Population Health by facilitating mobility outside of a facility and allowing community resources (e.g., food pantry, housing, career planning services, etc.) to interact with HIT.

AB.4.2 Patient Centeredness ECMM

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Patient Centeredness						
Patient-centered Technologies (PCTs)[WC6]	O	Organization has no formal inclusion of patient-centered (patient preferences, patient generated, patient controlled) technologies.	The organization is establishing patient capabilities that can be used by facilities.	Basic/Standard/Well-proven PCT functionality is available in the HIT ecosystem. Training and promotional materials are provided to the facilities. Well-proven PCTs are documented and established for regular care.	Providers are trained on PCT and Patient-generated Health Data (PGHD) as part of their core HIT training. Novel/New PCTs and new ways to use them are actively assessed and piloted. PGHD collection is standardized and regularly collected for well-proven PCTs.	Formal bodies exist to monitor the PCT-PGHD guidance/policy. Use is monitored for patient safety issues and quality improvement opportunities. Organization moves toward an integrated state where community and health system entities share information and resources to a point where they operate in unison.
	F	Patient-Centered Technology (PCT) utilization within care is ad hoc, uncoordinated, siloed, or experimental/one-off.	□ Providers are beginning to incorporate PCTs into their documentation or care plans. □ Documentation is being updated to include Patient-Generated Health Data (PGHD). □ There is a draft structure for overseeing facility-level support for incorporating PCTs into patient care.	□ Basic/Standard/Well-proven PCTs are supported by the HIT ecosystem. □ Providers are encouraged to utilize PCTs in their regular practice. □ PGHD guidance exists and providers are aware of them. □ Well-proven PCTs are documented and established for regular care. □ Providers are trained on PCT and PGHD as part of their core HIT training.	□ Novel/New PCTs and new ways to use them are actively assessed and piloted. □ PGHD collection is standardized and regularly collected for well-proven PCTs. □ Tools are set up so patients do not require additional training to use PCTs. □ There is a formal process or policy for Patient-Generated Health Data. □ Proper patient training is available.	□ Processes are in place locally to evaluate and track patient use and gather patient feedback on a regular basis.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
IT-based Patient Safety WC7, WC8, WC9, WC10, WC11	O	Organization has limited or no standard approach to identify and evaluate patient safety of HIT tools and processes.	The organization is beginning to develop methods for identifying and tracking HIT safety issues. The organization is beginning to develop and best practices and training for evaluating the safety or HIT and process.	HIT safety guidelines are grounded in best practices and offered and available to facilities. Training is available to communicate guidelines and risk factors as needed. There is organizational reporting of IT patient safety concerns. Risk management frameworks are holistic and include assessment of HIT risks.	Software for reporting and evaluation is in place. Implemented guidance for patient safety is included in software development. Organizational reports are evaluated.	Organization facilitates feedback with facilities. Software is appropriately updated with new guidance as it emerges. There is a complete feedback loop of organizational reports between organizational and local facility levels.
	F	Facility has no standard approach to identify and evaluate patient safety.	□ Facility staff receive basic training on HIT use and patient safety. □ There is a mechanism for reporting of patient safety issues. □ There is an understanding of ways to evaluate HIT's role in patient safety.	□ Guidelines for best practices are implemented into local processes for monitoring patient safety. □ Reporting of HIT-related patient safety incidents is consistent at the local level. □ Root Cause Analysis (RCA) process is in place.	□ Software for reporting and evaluation is in place. □ Implemented guidance for patient safety is included in software development. □ RCA is used routinely.	□ There is a complete feedback loop between organizational and local facility levels. □ Reports are distributed to area and local facilities. □ The ability to respond and integrate feedback is in place. □ Locally seamless monitoring is in place. □ RCA is followed by action plan and subsequent follow-up.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Community and Population Health	O	Functionality to support community and population health are not supported by the HIT system.	Organizational needs for community and population health are being identified and gathered into initial requirements documents.	Standard guidance and HIT solutions for community and population health are developed and available to share with facilities. Standard reports for population health are developed and available in HIT systems.	There are processes in place to routinely review and update HIT solutions to support best practices. The HIT systems support more flexible and advanced population reporting solutions.	Community health HIT is regularly evaluated and modified to ensure continued support for local needs. Population health data are obtained, evaluated, and analyzed, and used for decision making/resource allocation.
	F	Community resources such as organizations and services have not been integrated into the HIT software or solutions. There is limited or no access to local community health data (e.g. environmental, epidemiological, etc.) through the HIT System. Population health report generation and data use are ad hoc.	□ HIT requirements and need for inclusion of community resources such as organizations and services are being collected and documented. □ A process has been developed for identification and development / integration of Social Determinants of Health (SDOH) domains into the HIT system □ HIT requirements for integrating population reporting into the HIT system are documented.	□ Community resources are captured and available in the HIT solution. □ Population health reports can be compiled automatically using default reports within HIT system using patient information. □ Population health reports are readily viewed and used by risk managers, quality managers, and other medical staff.	□ Community resource use is documented similarly to other treatments or outcomes in health record. □ IT supports communication between community health staff and community resources.	□ Community resources to proactively address identified SDOH concerns are integrated into HIT solution. □ Data exchange with and accessibility to community resources has been established. □ Technologies for community health are not tied down to a single location; information can be entered and viewed in real time outside of the home facility. □ Population health data are routinely monitored, reported, and integrated into the workflow.

AB.5 Management of Technical Resources

AB.5.1 Management of Technical Resources Subdomain Definitions

Domain	Subdomain	Description
Management of Technical Resources	Human	Management of Human Resources reflects the degree to which the entity identifies and fulfils the personnel requirements in appropriate job categories at various levels of the organization to optimize utilization of and success with health information technology.
	Fiscal	Management of fiscal resources includes planning, budgeting, prioritizing, and obligating funding across the spectrum of the health information technology investment from infrastructure to staffing.

AB.5.2 Management of Technical Resources ECMM

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Management of Technical Resources						
Human [WC1]	O	No planning has occurred to identify the number or job categories of staffing required to support HIT at the organizational level. No guidance is offered to Facilities on approaches to identifying human resource needs to support HIT. Distribution of HIT human resources is ad hoc.	Recommendations for support roles and structures are being documented. A needs assessment has been completed showing the number of HIT staff and types of skills needed to support organizational HIT needs. A HIT staffing and support plan is being created.	Organizational technical resources have defined roles and responsibilities. There is a defined process for facilities to use to access technical resources.	Metrics on resource needs and utilization are collected and are used to guide changes and needs for system, processes, and staffing.	There are established processes to review organization-level technical resource utilization, response times, and trends on customer needs on a regular basis.
	F	Facility has key knowledge gaps in parts of the system both locally and regionally. Facility is dependent on "home-trained" staff to complete other duties as assigned and to provide support for systems.	□ A needs assessment has been completed showing the number of HIT staff and types of skills needed to support facility HIT needs. □ Processes for accessing HIT technical resources are being created. □ There is a process to analyze HIT staff coverage needs and document, prioritize and address gaps.	□ Expert HIT resources exist for each domain of the system. □ HIT technical resources have clearly defined roles and responsibilities.	□ The organization has a repeatable process for accessing available expert resources or HIT help. □ Metrics on HIT resource needs and utilization are collected and are used to guide system/ process / HIT staffing changes and needs. □ HIT resources are separated by duty or domain to prevent limitations in domain knowledge and other delays.	□ There are established processes to review technical resource utilization, response times, and trends on customer needs on a regular basis.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Fiscal [WC1]	O	Health Information Technology (HIT) is not a regular part of organizational fiscal planning processes.	Organizational-level equipment is being budgeted. Policies and processes for organizational financial planning are being developed.	HIT expenditures are monitored against HIT budgets. The organization is able to benefit from innovative funding sources such as the Centers for Medicare and Medicaid Services (CMS) accountable health communities model program to connect patients with community resources that can assist in meeting social needs.	The HIT budget is part of the organization's budgeting process. Financial audit processes are in place and are carried out regularly to promote accountability in HIT spending.	The budget is sufficient to support identified needs as well as technology refresh cycles. An established, long-term HIT financial management system is owned, reviewed, tracked, and updated by stakeholders.
	F	Health Information Technology (HIT) is not a regular part of facility fiscal planning processes.	□ Equipment is being budgeted. □ HIT refresh policies are emerging. □ HIT Budget roles are defined.	□ Facility is able to follow policy for equipment refreshes in most cases. □ Facility is addressing HIT equipment that needs to be redundant to support failures. □ Technical support positions are funded to minimum necessary levels.	□ Facility is well funded for IT equipment and support. □ Facility regularly refreshes HIT equipment per policy. □ Redundant equipment is in place for failover recovery, testing, and immediate replacement of failed user devices. □ Funded HIT staffing levels are sufficient to cover all business hours and after-hours emergencies.	□ There are processes in place to assess and address HIT support and equipment risks.

AB.6 HIT Services and Functions

AB.6.1 HIT Services and Functions Subdomain Definitions

Domain	Subdomain	Description
HIT Services and Functions	Human Centeredness and HIT Usability[WC12]	Taking a human or people-centered approach to understand the HIT system (including processes) user's needs, goals, and behaviors and ensuring that the HIT systems they use are usable, i.e., effective, efficient, and satisfy the user's goals and needs.
	Workflow and Business Processes	A business process is a set of activities and tasks that, once completed, will accomplish an organizational goal. Healthcare organizations employ many business processes to make key decisions, to ensure good communication between staff, etc. Business processes can be managed to facilitate process improvement and to reduce inefficiencies.
	HIT Functionality	Software, hardware, and system features that support HIT users to carry out business requirements and processes

AB.6.2 HIT Services and Functions ECMM

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
HIT Services and Functions [WC12]						
Human Centeredness and HIT Usability [WC12]	O	There is little or no awareness of the impact of usability on the organization. There is no usability policy in place.	There is increasing consideration of usability during system design / purchase, process development and deployment. There is an emerging focus on end-users. Senior management realizes that usability is an issue to be considered in certain functional areas.	Usability experts are involved in the analysis, selection, and implementation of new HIT or modules. There is a growing systematic, repeatable approach to human-centered design and usability. There is user focused development / tool selection.	All levels of management and end users are fully aware of and trained on usability issues and the need to address them for purposes of care quality and staff satisfaction. There are practices in place to identify usability issues. There are practices in place to report usability issues to the usability team.	There are processes in place to review usability practices and update them based upon best-in-class practices.
	F	There is a lack of awareness of the impact of usability.	□ Facility is beginning to include usability in system development/evaluation and process development. □ There is an emerging focus on end-users and HIT usability. □ Senior management realizes that usability is an issue to be considered in certain functional areas.	□ The facility is aware of usability experts in the organization. □ Facility understands how to leverage usability processes for local HIT product selection or HIT process development. □ Users are included in tool evaluation, selection, and development tasks.	□ All levels of management are fully aware of and trained on usability issues and the need to address them for purposes of care quality and staff satisfaction. □ There are practices in place to identify usability issues. □ There are practices in place to report usability issues to the usability team.	□ There are processes in place to review usability practices and update them based upon best-in-class practices.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Workflow and Business Processes WC13	O	Business processes are not defined. Business processes arise only as needed at the local level. There is little to no communication or collaboration between local levels. There is little to no communication or collaboration between organizational levels.	Business processes have been identified. Gaps in documenting business processes and repeatable practices have been identified and prioritized. There is a plan in place to address gaps in process definitions.	There are processes in place to include end users and facility personnel in the creation of standardized business processes. Identified business processes and best practices are documented. Updated processes are readily shared and accessible by facility personnel.	Well-informed business processes are integrated into trainings. Well-informed business processes are integrated into orientations.	Business processes are evaluated regularly for potential changes. There are governance processes in place to prioritize, review, and approve process changes. Changes are communicated to the organizational-level and facilities.
	F	Local business processes are not defined or there are gaps in needed processes, resulting in general uncertainty or disparity in how some tasks are accomplished. Business processes are not informed by other facilities.	□ Organizational business processes have been reviewed, and gaps in facility needs have been identified and there are plans in place to address gaps.	□ Business processes are defined and documented, and users know how to access them. □ Business processes are developed based on best practices. □ The facility is providing feedback on organization-level processes. □ There are processes in place to identify needs for new business process.	□ Business processes are readily available to staff and are incorporated into support processes. □ Well-informed business processes are integrated into trainings and orientations. □ There are processes in place to track compliance with business process training.	□ Business processes are evaluated regularly for potential changes. □ All proposed and actual changes are communicated to the organizational level. □ There are governance processes in place to prioritize, review, and approve process changes.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
HIT Functionality	O	HIT functionality is missing or does not adequately support some of the organization's needs, processes, or health services.	The organization is beginning to analyze, document, and prioritize the Health Information Technology (HIT) functions needed to support the facilities. The organization is beginning to map the business processes to the HIT functionality. The organization is aware of certification guidance.	Functionality needs are being addressed via technology and/or processes.	Changes or additions in functionality trigger reviews of process documentation, support documentation, and training documentation. There are official communications and/or communication channels for rolling out new functionality or changes in functions.	There are processes in place to review changes in business processes and the impact they have on IT functions supported. Appropriate changes are made based on information available.
	F	HIT functionality is missing or does not adequately support some of the facility's needs.	□ Facility has systematically identified functions that are missing or not meeting user needs. □ Facility is communicating gaps to the organization and has a prioritized plan to address gaps.	□ HIT functional needs are being mapped out, implemented, and addressed in ongoing assessments. □ Processes are in place for staff to request new or enhanced HIT functionality. □ Changes or additions in functionality trigger reviews of process documentation, support documentation, and training documentation.	□ There are official communications and/or communication channels for rolling out new functionality or changes in functions. □ Change control governance is in place and regularly evaluates value and costs of requested HIT functionality changes.	□ There are processes in place to review changes in business processes and the impact they have on supported IT functionality. □ Appropriate HIT functionality changes are made based on processes for assessing risks and priority.

AB.7 Data Ownership and Data Quality

AB.7.1 Data Ownership and Data Quality Subdomain Definitions

Domain	Subdomain	Description
Data Ownership and Data Quality	Data Ownership	Data Ownership is defined here as the ability for organizations and individuals to own and extract their data in compliance with legal, governance, and data security restrictions
	Data Quality	Data quality refers to the condition of a set of values of qualitative or quantitative variables. Data are regarded as high quality if it can be relied upon for its intended uses in operations, decision making, and planning.

AB.7.2 Data Ownership and Data Quality ECMM

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Data Ownership and Data Quality						
Data Ownership WC14, WC15	O	There is no universal policy for data sharing / data use. There is no documented policy informing and/or influencing laws and governance mechanisms for ownership of their healthcare data and controlled sharing of such data.	The organization recognizes the need to develop a policy surrounding data ownership and use, and sharing of data consistent is consistent with this policy.	Policies, processes, and Standard Operating Procedures (SOPs) have been developed and documented to support data ownership. Policies are adequately defined to inform and influence laws and governance mechanisms in support of local ownership of healthcare data and controlled sharing of such data to ensure data security.	Data ownership policies, processes, SOPs, and attendant laws and governance mechanisms are fully integrated into software/systems acquisition, systems development lifecycle, and application lifecycle management activities.	Metrics, performance measures, and technological improvements inform and influence policies, processes, and procedures for data governance. The organization is aware of and supports facility policies related to Health Information Technology (HIT) data ownership. Organization utilizes facility processes for unique requests to use facility's data. Data are able to be severed based on request.
	F	There is ad hoc data sharing or data use with other organizations. Facilities are unable to give data set to organizations at their request.	□ Facility is beginning to document data ownership needs and define policies. □ Facility is beginning to document data that can be shared.	□ Facility data sharing policies are in place. □ Facilities can provide data set to organizations as defined by policy.	□ Facilities provide appropriate data (per policy) to organizations on a regular basis. □ A request management process is established to track data sharing requests and responses and address any issues. □ Personnel are trained to carry out request management processes.	□ Local policies for data ownership are consistently re-evaluated. □ Agreements are in place so that data are appropriately and readily available for all stakeholders, per policies and procedures.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Data Quality WC14, WC15	O	Any data quality policies or practices are largely ad hoc. Policies are reactive to quality issues. Policies may not address long-term improvement.	There is awareness of data sharing guidance promoted by agencies such as the Center for Disease Control (CDC). There is an introductory level of governance, policies and procedures.	An enterprise-wide team is established to discuss organizational issues. There are standard data quality policies, processes, and Standard Operating Procedures related to governance, expectations for facilities, implementation practices and guidance for facilities. Data quality standards are shared with facilities.	Policies, processes, plans, standards, and practices are established at an organizational level. Policies, processes, plans, standards, and practices are documented at an organizational level. Expectations are expressed, and measurement tools are developed to enable overall system performance analysis.	Data quality processes, plans, standards and practices are reviewed, re-evaluated, and updated on a regular basis. The team reviews existing practices and methods. Industry best practices are regularly reviewed and appropriately applied to the organization.
	F	There are no data quality policies or practices in place. Data “Fixes” are not documented or reproducible. It is challenging to trace back to the source of flawed data.	□ The facility recognizes the need to adopt processes, plans, standards and practices related to data quality. □ A facility-level governance structure has been established to manage data quality processes, plans, and standards.	□ Policies for data quality monitoring are in place, such as ad hoc audits. □ Prioritized data standards or benchmarks are incorporated in collected data. □ HIT data validation controls are in place to ensure quality data entry and limit erroneous data entry at point of care.	□ Role-based security is in place to ensure quality data entry. □ Regular post-data entry audits are performed to check data quality.	□ Data are appropriately accessible, consistent, and comprehensive. □ Meanings of specific data are defined and understood. □ Data exist at the appropriate granularity to be relevant to all stakeholders. □ Processes and procedures are regularly reviewed and updated.

AB.8 Analytics and Business Intelligence

AB.8.1 Analytics and Business Intelligence Subdomain Definitions

Domain	Subdomain	Description
Analytics and Business Intelligence	Data Use at Point of Care	The ability to use available patient data at the point of care relies upon the incorporation of clinical decision support. This provides caregivers with knowledge and specific information about the patient at appropriate times to enhance healthcare. Clinical decision support is developed using algorithms, machine learning, and artificial intelligence derived from, and driven by, increasing volumes of patient healthcare data.
	Business Intelligence	The technologies, applications and practices for the collection, integration, analysis, and presentation of patient population data, health system data over time or an individual patient's progression over time.

AB.8.2 Analytics and Business Intelligence ECMM

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Analytics / Business Intelligence						
Data Use at Point of Care WC16	O	There are no policies in place for analytics and clinical decision support.	Requirements for the clinical decision support functionality and algorithms are documented. Outside data sources that contribute to clinical decision support have been identified and requirements are being documented.	The HIT tools for clinical decision support are developed and available for use. There are policies and processes in place to support governance and change management for clinical decision support tools and algorithms.	Analytics include predictive and prescriptive near and real-time support and there are skilled human resources. Clinical decision support HIT tools work with patient safety to support evaluations of clinical efficacy and impact. HIT tools can leverage and use external data in clinical decision support algorithms.	Analytics are comprehensive and include predictive and prescriptive near and real-time support and there are skilled human resources. Clinical decision support HIT tools work with patient safety to support continuous evaluations of clinical efficacy and impact.
	F	Facility has inconsistent, unstructured, and inaccessible data capture. Data cannot be utilized to provide Clinical Decision Support (CDS).	□ Facility is beginning to standardize data for use in Clinical Decision Support (CDS). □ Care providers are identifying needs for clinical decision support. □ Ad hoc query functionality is available to support clinical decisions.	□ Facility has identified data use leads whom are knowledgeable in analysis and reporting. □ There are demonstrated examples of CDS within clinical workflows.	□ Facility is able to integrate data sources into the local system. □ CDS is a relied-upon core function within the setting.	□ Facility is able to access all patient data in real time from all internal points of care. □ Frontline workers are routinely requesting new CDS functionality. □ CDS functionality is reviewed and updated regularly. □ There are processes in place to regularly review data use needs and identify changes or additions.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Business Intelligence (BI) WC16	O	No documentation or training has been defined for facilities to prepare and analyze data. Organizational or other requirements have not been documented and shared with facilities to inform business analysis.	Organizational or other requirements for data preparation or analytics are documented and shared with stakeholders. Guidance is being developed to adapt requirements to facilities.	Business intelligence, analytics, and business activity monitoring capabilities are available for use. Processes are in place to apply BI to identify and prioritize improvement opportunities.	Business intelligence, analytics, and business activity monitoring capabilities are documented, repeatable, and managed. Processes for applying BI to address performance issues or correct inefficiencies are documented as part of Standard Operating Procedures (SOPs).	Analysis algorithms and formulas are routinely updated and shared with facilities. Data are shared with relevant stakeholders while respecting data ownership. Information is appropriately published for use by outside individuals or parties.
	F	Data are not readily available for analysis. Requirements have not been defined to apply analyzed data to local business decisions.	□ Facility data, reporting and visualization requirements are identified, documented and shared with the organization. □ Standard report formats are emerging.	□ Data are available for analysis. □ Procedures for analyzing data have been documented. □ There are HIT tools for supporting the use of data to inform business decisions, support local leadership and support federal or other requirements. □ HIT tools support data visualization requirements.	□ Processes have been defined for disseminating information in a visually relevant format to all appropriate stakeholders, including leadership and other local staff. □ There are processes to document data requests, review results and document logic. □ Ad hoc data requests are tracked; results are reviewed and logic is documented.	□ There are processes in place to review BI needs and prioritize new requirements. □ All pertinent data are reproducibly analyzed in a timely manner. □ Changes to analysis processes are up to date with data sources, standards, calculations, etc. □ Analysis is easily available and customizable to the audience's purposes.

AB.9 HIT Learning Health System

AB.9.1 HIT Learning Health System Subdomain Definitions

Domain	Subdomain	Description
HIT Learning Health System	HIT Training	Practices for developing workforce to utilize available technologies, best practices, etc. to deliver patient care, perform business analysis, support HIT systems, and carry out processes necessary for healthcare delivery and business operation.
	HIT Support	Processes and organizational structure related to the implementation and maintenance of Health IT, including hardware installation/maintenance, requirements gathering and development of HIT systems, providing immediate assistance to end users with HIT-related guidance, etc.
	Community of Practice	Communities of practice are formed by people who engage in a process of collective learning around a shared interest. This can lead to collaborative engagement that works towards the meaningful use of electronic health records through the use of a knowledge-sharing platform.

AB.9.2 HIT Learning Health System ECMM

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
HIT Learning Health System						
HIT Training	O	Training resources developed by the organization may be ad hoc.	One or more designated training roles are available at organizational-level. Training needs have been evaluated and curriculum is being established.	Organizational-level collaborates with facilities and area personnel to provide comprehensive training opportunities for system use and support. Training materials are applicable at the facility level.	Users receive training on HIT process in a standardized manner. Ongoing trainings are proactive with respect to upcoming HIT changes. Training is comprehensive in nature.	There are processes in place to regularly review training materials based upon support issues, changes in business process and functionality.
	F	Training processes are ad hoc. Users learn most HIT background, practices, etc. from coworkers or through "on-the-job" discovery.	□ Facility is evaluating HIT training needs that may be unique or different from organizational training.	□ Orientation includes training for a designated job role. □ Facility collaborates with organizational-level trainers to provide comprehensive training opportunities for use of system. □ Training compliance is monitored and tracked.	□ Training is personalized to account for local instance of HIT and facility processes in place. □ Users receive training on HIT processes in a standardized manner.	□ There are processes in place to regularly review training materials based upon support issues, changes in business process and functionality. □ Appropriate notification of HIT changes is communicated to users and training is updated to reflect these changes.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
HIT Support	O	No formal role or team at the organization level is available to address support requests. Collaboration with other support levels is ad hoc.	A designated role or team at organizational-level is available to address support requests that impact the organization. Practices for recording support requests and actions taken are emerging.	A designated role or team at organizational-level is available to address support requests. There are processes and tools to support recording and tracking requests. A knowledge base is being established. Support issues can be addressed in a timely manner.	Support requests are consistently documented and are transferred between levels of support when one level cannot solve the issue. A knowledge base has been established and is available for all levels of support. There are service level agreements (SLAs) in place and adequate staffing and resources in place to meet the SLAs. SLA metrics are being tracked.	There are processes in place to review adherence to SLAs and review common issues. There are processes in place to review the knowledge base and update it on a regularly scheduled basis. Change management practices include updates to the knowledge base.
	F	Support may be ad hoc or conducted through contact with the right person. Ad hoc or informal reporting processes are used when the system is down or there is an issue. Users are unaware of whom to contact when they need something changed with the Health Information Technology (HIT).	□ A designated role or team is identified and locally available to field support requests by users. □ Support issues and requests are beginning to be tracked and resolutions are recorded.	□ There are processes and tools to support recording and tracking requests. □ When needed, support escalation processes are in place.	□ Support requests are consistently documented and are transferred between levels of support when one level cannot solve the issue. □ A knowledge base has been established and is available for all levels of support and end-users. □ There are service level agreements (SLAs) in place and adequate staffing and resources to meet the SLAs. □ SLA metrics, including response time, are being tracked.	□ There are processes in place to review adherence to SLAs and review common issues. □ There are processes in place to review the knowledge base and update it on a regularly scheduled basis. □ Change management practices include updates to the knowledge base.

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Community of Practice (CoP)	O	There is no established Community of Practice (CoP). Knowledge is chaotic and ad hoc. Information is kept in silos and discovered by accident throughout the organization. Many practices and lessons are repeated over again with no real organizational learning.	A CoP framework is being developed. There is some limited sharing of lessons and information. CoP groups and leadership are being identified.	CoP(s) are established. Pathways are created for organized sharing. Knowledge is pooled as an organization.	Collaboration is prioritized. Joint enterprise is been negotiated as a formal CoP organization-wide. Organizational-wide feedback is evolving the knowledge base.	There are processes in place to evaluate the CoP(s) and ensure that they are meeting user's needs. Understanding of organizational knowledge is optimized. Knowledge resources and application of knowledge are being iteratively improved and re-applied to improve the larger organizational mission.
	F	There is no local engagement in a Community of Practice (CoP).	□ The facility is informing the formation of the CoP(s) through specific participants in the specialty working groups (clinical informaticist, etc.).	□ The facilities are aware of the formalized CoP. □ Facilities are sharing information through participation of specific participants in the CoP. □ Users are aware of the knowledge base for finding information related to HIT.	□ Users at the facilities use the CoP resources as their first resource for determining how to optimize Health Information Technology (HIT). □ Users inform the CoP by participating directly in discussion forums. □ Management represents needs of the facility through the CoP.	□ Facilities leverage the CoP to express their HIT needs. □ Facility participants know how to participate in the change management process as acceptance testers/feedback through the CoP. □ Facility participants are providing feedback to the CoP for improving HIT and resources.

Appendix C – Example Assessment

The best way to determine which level describes the facility domain/subdomain is to look first at the Nascent box. For this model, "nascent" describes a capability or function which does not currently exist in the system. If the facility does not have this capability or function in place, the Nascent box should be circled or highlighted. If the facility is already taking steps to introduce this functionality, or said functionality is already in place, the participant should move to the next level. The individual should continue reading through the processes at each level until the level is reached that best describes that particular facility's capabilities. This process should be repeated for each assigned domain/subdomain.

Displayed below are examples of assessments within the Technical Governance subdomain.

Example 1 displays a Technical Governance assessment for a facility has not completed all actions required to merit a Level 2 capability rating, so the facility falls into a Level 1 assessment category.

AB.1.2 Governance and Leadership Capability Maturity Model

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Governance and Leadership						
Technical Governance[WC1]	O	Decisions are made on an ad hoc basis. There is limited or no fiscal planning for Health Information Technology (HIT) investments. Assess as "Level 1: Nascent" if the facility cannot meet descriptors in Level 2.	Governance processes are being developed at an Organizational and Area level. Standard Operating procedures (SOPs) for decision making and financial decisions are in development. Initial metrics are being established.	HIT Governance structure is established at a national and area level and it includes clear roles and responsibilities. Governance SOPs are in place and are endorsed. Decision-making processes are defined. Metrics are vetted by national and Area and consistent with strategic planning. Plans are developed to identify adequate staffing and fiscal needs.	Governance is implemented for routine decision making. Routine metric reporting is in place and is shared with National and Area level. Human and fiscal resourcing plans are monitored.	Repeatable processes are used for decision making with appropriate engagement of stakeholders. Metrics are used in decision making. Metrics are regularly reviewed and modified to meet changing business needs. Human and fiscal resourcing plans are monitored and modified based on ongoing review. HIT Governance structure is regularly reviewed to make sure it supports facilities.
	F	Official Health Information Technology (HIT) governance structures are not clearly established. HIT is not a regular part of fiscal planning processes.	□ HIT lifecycle management policies for equipment, software, infrastructure, etc. are emerging. □ HIT fiscal budgeting roles are defined, and HIT is a part of fiscal planning.	□ HIT performance metrics have been identified and are regularly tracked and reported to appropriate leadership. □ Facility is able to follow policy for lifecycle management for equipment, software, infrastructure, etc. □ Facility is addressing equipment and processes for redundancy to support failures. □ Technical support positions are adequately funded.	□ Leadership routinely gets reports concerning HIT needs. □ Facility is adequately resourced to support HIT. □ Redundancy is in place for failover recovery, testing, and immediate replacement of failed devices. □ Funded HIT staffing levels are sufficient to cover all business hours and after-hours emergencies.	□ HIT Governance is included in decision making process for technology decisions. □ Future budgeting is based on known refresh and needs of the organization. □ Adequate funds are available to address HIT support and equipment risks. □ Any security controls are vetted by governance group. □ Facility regularly refreshes IT equipment, software, infrastructure, etc. per policy.

Figure AC-1 Technical Governance Assessment at Level 1

Example 2 displays the assessment for a facility that was able to meet all capabilities within Level 2, so it received a Level 2 Technical Governance capability rating.

AB.1.2 Governance and Leadership Capability Maturity Model

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Governance and Leadership						
Technical Governance[WC1]	O	Decisions are made on an ad hoc basis. There is limited or no fiscal planning for Health Information Technology (HIT) investments.	Governance processes are being developed at an Organizational and Area level. Standard Operating procedures (SOPs) for decision making and financial decisions are in development. Initial metrics are being established. Assess as "Level 2: Emergent" if the facility can meet descriptors in Level 2.	HIT Governance structure is established at a national and area level and it includes clear roles and responsibilities. Governance SOPs are in place and are endorsed. Decision-making processes are defined. Metrics are vetted by national and Area and consistent with strategic planning. Plans are developed to identify adequate staffing and fiscal needs.	Governance is implemented for routine decision making. Routine metric reporting is in place and is shared with National and Area level. Human and fiscal resourcing plans are monitored.	Repeatable processes are used for decision making with appropriate engagement of stakeholders. Metrics are used in decision making. Metrics are regularly reviewed and modified to meet changing business needs. Human and fiscal resourcing plans are monitored and modified based on ongoing review. HIT Governance structure is regularly reviewed to make sure it supports facilities.
	F	Official Health Information Technology (HIT) governance structures are not clearly established. HIT is not a regular part of fiscal planning processes.	☑ HIT lifecycle management policies for equipment, software, infrastructure, etc. are emerging. ☑ HIT fiscal budgeting roles are defined, and HIT is a part of fiscal planning.	☐ HIT performance metrics have been identified and are regularly tracked and reported to appropriate leadership. ☐ Facility is able to follow policy for lifecycle management for equipment, software, infrastructure, etc. ☐ Facility is addressing equipment and processes for redundancy to support failures. ☐ Technical support positions are adequately funded.	☐ Leadership routinely gets reports concerning HIT needs. ☐ Facility is adequately resourced to support HIT. ☐ Redundancy is in place for failover recovery, testing, and immediate replacement of failed devices. ☐ Funded HIT staffing levels are sufficient to cover all business hours and after-hours emergencies.	☐ HIT Governance is included in decision making process for technology decisions. ☐ Future budgeting is based on known refresh and needs of the organization. ☐ Adequate funds are available to address HIT support and equipment risks. ☐ Any security controls are vetted by governance group. ☐ Facility regularly refreshes IT equipment, software, infrastructure, etc. per policy.

Figure AC-2 Technical Governance Assessment at Level 2

Example 3 displays the assessment for a facility that met all Level 2 capabilities Technical Governance and some, but not all, Level 3 capabilities, so the facility was assessed with a Level 2 capability rating.

AB.1.2 Governance and Leadership Capability Maturity Model

Domains / Subdomains	O/F	Level 1: Nascent	Level 2: Emerging	Level 3: Established	Level 4: Institutionalized	Level 5: Optimized
Governance and Leadership						
Technical Governance[WC1]	O	Decisions are made on an ad hoc basis. There is limited or no fiscal planning for Health Information Technology (HIT) investments.	Governance processes are being developed at an Organizational and Area level. Standard Operating procedures (SOPs) for decision making and financial decisions are in development. Initial metrics are being established. Assess as "Level 2: Emergent" if all of Level 2 descriptors and some of Level 3 descriptors are checked.	HIT Governance structure is established at a national and area level and it includes clear roles and responsibilities. Governance SOPs are in place and are endorsed. Decision-making processes are defined. Metrics are vetted by national and Area and consistent with strategic planning. Plans are developed to identify adequate staffing and fiscal needs.	Governance is implemented for routine decision making. Routine metric reporting is in place and is shared with National and Area level. Human and fiscal resourcing plans are monitored.	Repeatable processes are used for decision making with appropriate engagement of stakeholders. Metrics are used in decision making. Metrics are regularly reviewed and modified to meet changing business needs. Human and fiscal resourcing plans are monitored and modified based on ongoing review. HIT Governance structure is regularly reviewed to make sure it supports facilities.
	F	Official Health Information Technology (HIT) governance structures are not clearly established. HIT is not a regular part of fiscal planning processes.	☑ HIT lifecycle management policies for equipment, software, infrastructure, etc. are emerging. ☑ HIT fiscal budgeting roles are defined, and HIT is a part of fiscal planning.	☐ HIT performance metrics have been identified and are regularly tracked and reported to appropriate leadership. ☑ Facility is able to follow policy for lifecycle management for equipment, software, infrastructure, etc. ☐ Facility is addressing equipment and processes for redundancy to support failures. ☐ Technical support positions are adequately funded.	☐ Leadership routinely gets reports concerning HIT needs. ☐ Facility is adequately resourced to support HIT. ☐ Redundancy is in place for failover recovery, testing, and immediate replacement of failed devices. ☐ Funded HIT staffing levels are sufficient to cover all business hours and after-hours emergencies.	☐ HIT Governance is included in decision making process for technology decisions. ☐ Future budgeting is based on known refresh and needs of the organization. ☐ Adequate funds are available to address HIT support and equipment risks. ☐ Any security controls are vetted by governance group. ☐ Facility regularly refreshes IT equipment, software, infrastructure, etc. per policy.

Figure AC-3 Technical Governance Assessment at Level 2 with Some Level 3 Capabilities

Appendix D – ECMM Background

What is a Maturity Model?

In August of 1986, the Software Engineering Institute at Carnegie Mellon University, with assistance from the MITRE Corporation, initiated the development of a process model for improving software development.[3] The team used project management pioneer Phillip Crosby's management stages and ideas around continuous improvement to develop levels of organizational maturity.[3] Since that time, use of maturity models has evolved and been applied to broader disciplines outside of software development.[4] As with any model, an ECMM has limitations and may not fully or adequately represent all aspects of the larger system in which a health information system (HIT) resides. The intention is not to create a perfect model, but to create a tool that enables an organization to continuously improve.

HIT ECMM Development Process

The ECMM was developed as a tool to assist in determining the maturity level of an organization and its facilities, to promote HIT best practices, and to support quality patient care. The ECMM was designed to address an organization's unique needs and provide a process to determine the current maturity level, and identify the steps necessary for continued maturation. The process used to define the model is documented below in Figure AD-1. Although the process is described linearly, the actual model development included numerous revisions of the domains and subdomains and refinement of the maturity-level definitions as the model evolved.

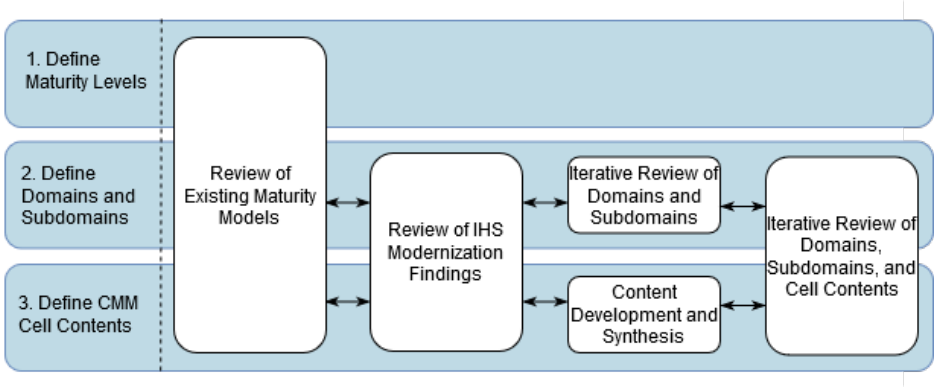


Figure AD-1 HIT ECMM Development Process

1. Defining Levels of Maturity

The team researched existing models to reference and use common constructs and definitions for the maturity levels. After discussion, the team chose to use the levels of maturity defined by the MEASURE Evaluation project in their interoperability ECMM.[2] This group had performed a survey of various maturity levels and worked toward creating a standard.

2. Defining Domains and Subdomains

Through review of existing models, the team identified several overarching themes which are relevant to the IT modernization. However, none of the existing models individually supported all of the themes required by facilities with health information technology. The use of several different models to cover the breadth of the organization's domains was determined to be challenging and inefficient.

In the development of the ECMM, the team used data collected from Indian Health Service (IHS) facility visits, the IHS legacy assessment, and other work generated during the IHS Modernization project. Additionally, existing models were examined to identify domains and subdomains that were applicable to the IHS. Once the initial domains were identified by the team, there was an iterative process involving subject matter experts (SMEs), both clinical and technical, to evaluate the model and provide feedback.

3. Defining ECMM Cell Contents

Once the basic structure for the domains and subdomains and the maturity levels were developed, the team initiated an iterative process to generate and synthesize the model contents. In addition, maturity models from health and related technology fields were reviewed and incorporated. Content was generated based upon other workstream analyses and from consultation with SMEs familiar with the organizational network. SMEs were engaged to review the ECMM and contribute input and recommendations.

Next Steps — Continued Refinement and Progression

The current version is a comprehensive maturity model intended for the use by facilities to facilitate the implementation, management, and modernization of their HIT. The model should be revised and refined to reflect the needs of the organization.

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