
Part III – TECHNICAL ARCHITECTURE

Chapter 7– TECHNICAL CAPABILITY MATRIX



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Introduction

This chapter presents the Medicaid IT Architecture (MITA) Technical Capability Matrix (TCM) and explains its role in the MITA Framework. When the State Medicaid Agency (SMA) performs a State Self-Assessment (SS-A) utilizing the MITA Framework, it starts by determining the As-Is operations (current) level of maturity of each process and the level it seeks to achieve in the To-Be environment (future).

The Centers for Medicare & Medicaid Services (CMS) requires States to align to and advance increasingly in MITA maturity for business, architecture, and data. CMS expects the SMA to complete and continue to make measurable progress in implementing its MITA Roadmap. The MITA TCM provides the guidance for the Technical Architecture (TA) transformation.

The topics covered in this chapter include:

- ❖ Technical Capability Matrix
- ❖ Evolution of the Technical Capability Matrix
- ❖ Using the Technical Capability Matrix

Purpose

The purpose of the TCM is to describe the boundaries and behavior of each MITA technical function in the context of the five (5) levels of MITA maturity as described in Part I, Chapter 3, Maturity Model. Business capabilities (see Part I, Chapter 5, Business Capability Matrix) illustrate how a business process matures and improves over time. Information capabilities (see Part II, Chapter 6, Information Capability Matrix) include data management strategies, data models, and data identified in the business capabilities that enable technical capabilities. Technical capabilities are enablers of business capabilities. Technical capabilities are enablers that support the business process at specific levels of maturity or technologies that promote MITA goals and objectives (e.g., flexibility, adaptability, and interoperability). There is no one-to-one match between business, information, and technical capabilities. The TCM is the primary tool for selecting the appropriate level of maturity for the TA.

Scope

The TCM provides specific technical capability statements with defined criteria across five (5) level of maturity for each MITA business area. Part I, Chapter 5, Business Capability Matrix, defines the business capabilities for each business process. Part II, Chapter 6, Information Capability Matrix, defines the information capabilities for each of the MITA business areas. This chapter on the TCM focuses exclusively on technical capabilities.

The MITA Framework 3.0 supports the expansion of performance standards, performance measures, and performance metrics. CMS defines them in future guidance or an individual SMA defines them. CMS intends to provide additional guidance concerning performance standards—both functional and non-functional, and with respect to a Service Level Agreement (SLA) and a Key Performance Indicator (KPI).

Technical Capability Matrix

A technical capability describes a technical function at a specific MITA Maturity Level. The TA assigns technical capabilities to a maturity level based on the maturity level of the business usage they enable. Technical capabilities can affect multiple business processes in order to provide benefits to stakeholders. Whereas business capabilities define business services, the TA maps technical capabilities to technical services. Technical capabilities associate themselves with IT solutions or enablers.

The TCM consists of technical capabilities allocated to five (5) maturity levels for all technical functions. Each technical capability corresponds to technical functionality providing the technologies for one or more of the following:

- ❖ Enabling one or more business capability (e.g., forms management and workflow for automating provider enrollment).
- ❖ Realizing one or more MITA goal or objective. For example, the technical capabilities that are part of a Service-Oriented Architecture (SOA) enable the goal “promote reusable components – modularity”, such as the use of an Enterprise Service Bus (ESB).
- ❖ Enabling the transition of a legacy system or process to the MITA Framework.
- ❖ Alignment with the Enhanced Funding Requirements: Seven Conditions and Standards (a.k.a. Seven Standards and Conditions).

Table 7-1 provides the TCM for the MITA Framework. For each of the five (5) levels of MITA Maturity, the TCM provides the Technical Service Area (yellow band), and the relevant Service Classification Groups (blue band). See Part III, Chapter 4, Technical Services, for detail discussion on the technical service areas and service classifications. The following is a brief description:

1. **Technical Service Area** – Is a technical tier supporting the secure construction, exchange, and delivery of service components.
2. **Technical Service Classification** – Is a lower level classification comprised of one or more service standard.

Health care IT systems are evolving along the continuum of technical capabilities. The MITA technical capabilities support the MITA goals and objectives and align with the Seven Standards and Conditions. The capability descriptions below provide guidance as the Medicaid Enterprise evolves.

1. **Level 1 Capabilities** – The SMA uses predominantly manually intensive technical processes that do not use current industry standards.
2. **Level 2 Capabilities** – The SMA uses a mix of manually intensive processes and electronic transactions or functionality. Accessibility expands to include multiple types of delivery (e.g., browser, kiosk, voice response system, or mobile phone).
3. **Level 3 Capabilities** – The SMA utilizes an ESB to promote interoperability. Partners include one or more of the following: intrastate and interstate agencies, federal entities and external health care stakeholders.

4. **Level 4 Capabilities** – The SMA promotes interoperability between interstate agencies, federal partners, Health Insurance Exchange (HIX), Health Information Exchange (HIE), and other external health care stakeholders.
5. **Level 5 Capabilities** – The SMA promotes Cloud Computing functionality, such as, real-time access to information.

Table 7-1. MITA Technical Capability Matrix

MITA Technical Capability Matrix				
Level 1 Capabilities	Level 2 Capabilities	Level 3 Capabilities	Level 4 Capabilities	Level 5 Capabilities
Access and Delivery				
Client Support (Business Results Condition)				
Beneficiary and provider access to appropriate Medicaid business functions via manual or alphanumeric devices.	Beneficiary and provider access to appropriate Medicaid business functions via portal with single online access point. The SMA provides single browsers (i.e., Microsoft Internet Explorer) support for portal. Viewer is unable to customize or make adjustments (e.g., font size, language support) to portal presentation.	Beneficiary and provider access to appropriate Medicaid business functions via portal with single online access point. The SMA supports three (3) most popular browser versions (i.e., Microsoft Internet Explorer), Google Chrome, and Mozilla Firefox).	Beneficiary, provider, and other staff access beneficiary electronic health information online including clinical information. The SMA exchanges health information with Health Information Exchange (HIE). Beneficiary has access to Health Insurance Exchange (HIX). The SMA supports most major browsers for devices that include the most popular operating system brands (i.e., Android, Macintosh, and Windows).	The SMA adopts nationally exchange of beneficiary, provider, and other appropriate information. The SMA adopts information exchange with national agencies and Health Information Exchange (HIE). The SMA provides cross-regional Beneficiary access to Health Insurance Exchange (HIX). SMA provides linguistically, culturally, and competency appropriate information for all services. The SMA fully complies with Section 508 Accessibility on various end-user devices (i.e., computers, mobile devices, etc.).

MITA Technical Capability Matrix				
Level 1 Capabilities	Level 2 Capabilities	Level 3 Capabilities	Level 4 Capabilities	Level 5 Capabilities
Business Intelligence (<i>Business Results Condition and Reporting Condition</i>)				
Business intelligence information available by custom-coded programming.	Business intelligence information is inconsistent and unreliable with very little automation.	Business intelligence information is available for specific business functions. The SMA limits access to a small group of stakeholders.	The SMA adopts strategic business intelligence environment with defined governance policies and enforcement. Business objectives drive business analysis and performance management strategies. The SMA adopts enterprise-wide performance standards and metrics for business analysis.	The SMA adopts business process specific performance standards and metrics for business analysis. The SMA performs behavior simulation and prediction modeling on large populations. The SMA shares business analysis with providers, beneficiaries, and trading partners.
Forms and Reporting (<i>Business Results Condition and Reporting Condition</i>)				
The SMA conducts direct data entry from paper forms.	The SMA and stakeholders conducts data entry using electronic forms. The SMA produces reports with manual data entry and processing.	Online electronic forms accept limited file type (e.g., txt, xls, or pdf) attachments. The SMA adopts periodic submission of electronic reports.	The SMA adopts real-time submission of claims, clinical, and other reporting information.	The SMA adopts real-time national database accessible with regional, state, and local reporting information.
Performance Measurement (<i>Reporting Condition</i>)				
The SMA calculates performance measures and metrics in spreadsheets.	The SMA defines enterprise performance standards. The SMA collects information in predefined formats. The SMA	The SMA adopts CMS-defined performance standards and metrics. The SMA defines performance measures and	The SMA produces automatic system alerts and alarms when performance metric is not within defined performance standard	The SMA adopts national performance standards with system alerts when performance metric is not within defined

MITA Technical Capability Matrix				
Level 1 Capabilities	Level 2 Capabilities	Level 3 Capabilities	Level 4 Capabilities	Level 5 Capabilities
	generates performance measures and metrics using predefined and ad hoc reporting methods.	metrics for specific business processes for collection and reporting of performance standards.	boundaries.	performance standard boundaries.
Security and Privacy (Industry Standards Condition)				
Beneficiary and provider access to services via manual submission, alphanumeric devices (i.e., paging), or Electronic Data Interchange (EDI). The SMA uses policy and procedures controls to ensure privacy of information.	The SMA provides member and provider access to services via browser, kiosk, voice response system, or mobile phone.	The SMA provides member and provider access to services online via mobile device. The SMA supports automatic user authentication. The SMA provides staff with Single Sign-On (SSO) functionality to a majority of the applications in the State Medicaid Enterprise. The SMA restricts access to data elements based on defined access roles.	The SMA provides user authentication via SecureID tokens and delivery of results to authentication and authorization functions.	The SMA provides user authentication via biometric identification and delivery of results to authentication and authorization functions.
Intermediary and Interface				
Business Process Management (MITA Condition)				
Business processes consists primarily of manual paper-based activity to accomplish tasks. The SMA is not using MITA initiative for	The SMA uses a mix of manual and automatic business processes. The SMA aligns business workflows with any provided by CMS in support of the Medicaid and	The SMA adopts specification and management of business processes in conformance with nationally recognized BPM standards (e.g., Business Process Execution	The SMA aligns to and advances increasingly in MITA maturity for business, architecture, and data. The SMA develops MITA Maturity Model Roadmap to monitor progress in MITA	The SMA reaches targeted MITA maturity for business, architecture, and data. The SMA has full integration of the MITA initiative with business,

MITA Technical Capability Matrix				
Level 1 Capabilities	Level 2 Capabilities	Level 3 Capabilities	Level 4 Capabilities	Level 5 Capabilities
business, architecture and data.	Exchange business operation's and requirements (i.e., MITA Framework).	Language (BPEL)). The SMA has full integration of the MITA initiative with business, architecture and data within the intrastate.	maturity. The SMA has full integration of the MITA initiative with business, architecture, and data within the interstate.	architecture, and data within the nation.
Relationship Management (Modularity Standard and Industry Standards Condition)				
The business relationship processes consists primarily of manual activity to accomplish tasks. The SMA uses non-standardized definition and invocation of services.	The SMA applies a mix of HIPAA and state-specific standards for service support.	The SMA adopts intrastate Basic Business Relationship Management (BRM), including tracking relationships between Medicaid system users (e.g., beneficiaries and providers) and the services requested and received. The SMA provides services support using architecture that complies with MITA Framework, industry standards, and other nationally recognized interface standards.	The SMA adopts business analytics for its BRM. The SMA provides offers personalization capabilities to beneficiaries, providers, and business partners. The SMA provides services support using a cross-enterprise services registry.	The SMA adopts business analytics for its interstate BRM. The SMA provides offers personalization capabilities to beneficiaries, providers. The SMA provides services support using a cross-enterprise services registry.
Data Connectivity (Leverage Condition)				
Manual information exchange between multiple organizations, sending information requests via telephone or e-mail to data	The SMA conducts electronic information exchange within the agency via an information hub using secure information. The location and format are	The SMA conducts electronic information exchange with multiple intrastate agencies via an information hub. The SMA performs	The SMA uses canonical data models to communicate between different data formats. The SMA adopts enterprise integration strategy.	The SMA uses canonical data model to communicate between interstate agencies, federal entities, and

MITA Technical Capability Matrix				
Level 1 Capabilities	Level 2 Capabilities	Level 3 Capabilities	Level 4 Capabilities	Level 5 Capabilities
processing organizations and receiving requested information in nonstandard formats and in various media (e.g., paper, facsimile, EDI).	transparent to the stakeholder and the results delivered in a defined style that meets the stakeholder's needs.	advanced information monitoring and route system alerts and alarms to communities of interest if the system detects unusual conditions.	The SMA is migrating from a point-to-point to message based exchange. The SMA obtains information easily and exchanges with intrastate agencies and entities.	health care stakeholders.
Service Oriented Architecture (SOA) (Modularity Standard and Interoperability Condition)				
The SMA uses non-standardized approaches to orchestration and composition of functions.	The SMA conducts reliable messaging, including guaranteed message delivery (without duplicates) and support for non-deliverable messages.	The SMA adopts MITA recommended ESB, automated arrangement, coordination, and management of system. SMS conducts system coordination between intrastate agencies and some external entities.	The SMA adopts MITA recommended ESB. The SMA uses SOA and System Development Life Cycle (SDLC) methodologies and ensures seamless coordination and integration with intrastate agencies and entities, Health Information Exchange (HIE), and Health Insurance Exchange (HIX).	Systems ensure seamless coordination and integration with federal agencies and entities, Health Information Exchange (HIE), and Health Insurance Exchange (HIX)
System Extensibility (Business Results Condition and Interoperability Condition)				
The SMA does not use web services. The SMA conducts extensive code changes for additional system functionality.	The SMA uses a mix of manual and electronic transactions to conduct business activity. The SMA uses some isolated web services.	The SMA uses RESTful and/or SOAP-based web services for seamless coordination and integration with other U.S. Department of Health & Human Services (HHS) applications and intrastate agencies including	The SMA coordinates RESTful and SOAP-based web services with interstate agencies including Health Information Organizations (HIO) and the Health Information Exchanges	The SMA coordinates RESTful and SOAP-based web services with all available federal agencies (i.e., Internal Revenue Service). The SMA increases federation and intrinsic interoperability

MITA Technical Capability Matrix				
Level 1 Capabilities	Level 2 Capabilities	Level 3 Capabilities	Level 4 Capabilities	Level 5 Capabilities
		the Health Insurance Exchange (HIX).	(HIE). The SMA adopts web services of Nationwide Health Information Network (NwHIN) priority areas.	with minimal impact for new service capability. The SMA adopts full usage of NwHIN with exposed services to all appropriate parties.
Integration and Utility				
Configuration Management (Modularity Standard and Leverage Condition)				
The SMA uses technology-dependent interfaces to applications. Introduction of new technology significantly affects interfaces to applications. The SMA does not use Configuration Management methodology.	The SMA uses technology-neutral interfaces that localize and minimize the impact of the introduction of new technology (e.g., information abstraction in data management services to provide product-neutral access to information based on metadata definitions). The SMA uses a mixture of manual and automated Configuration Management methodology.	The SMA uses Software Configuration Management to reproduce solutions in a controlled, incremental fashion, rather than focusing on controlling solution products. The SMA identifies intrastate configuration items and baselines.	The SMA adopts Build Management, Process Management, and Environment Management through the SDLC. The SMA adopts system development process between interstate agencies and external entities.	The SMA fully utilizes Build Management, Process Management, and Environment Management through the SDLC. The SMA adopts system development process between intrastate and interstate agencies, federal entities, and external health care stakeholders.
Data Access and Management (Interoperability Condition)				
The SMA uses ad hoc formats for information exchange. The SMA uses ad hoc, point-to-	The SMA has information residing in one schema with tight coupling approach. The SMA applies single	The SMA conducts information exchange (internally and externally) using MITA Framework,	The SMA conducts information exchange (internally and externally) using MITA Framework,	The SMA develops data model using MITA Framework, industry standards, and other

MITA Technical Capability Matrix				
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<p>point approaches to systems integration. The SMA focuses on meeting compliance thresholds for state and federal regulations using state-specific standards.</p>	<p>source of information methodologies. The SMA develops data models and maps information exchanged with external organizations to the model. The SMA has information residing in multiple locations.</p>	<p>industry standards, and other nationally recognized standards. The SMA uses service-enabling legacy systems using MITA Framework, industry standards, and other nationally recognized standards. The SMA performs data management storage optimization and consolidation techniques. The SMA has information residing in multiple locations, but accessible to stakeholders providing uniform access in an intrastate mediated schema.</p>	<p>industry standards, and other nationally recognized semantic data standards (ontology-based) for clinical information and electronic health records. The SMA adopts information archiving solutions to meet data-retention policies and compliance guidelines.</p>	<p>nationally recognized standards and has access to technical services in a national repository.</p>
Decision Management (Leverage Condition)				
<p>The SMA uses manual application of business rules that which results in unreliable and inconsistent decision-making. The SMA does not document business rules. The SMA does not apply business</p>	<p>The SMA imbeds business rules in the core application code. Business rules execute in a batch-operating environment. The SMA documents business rules as narrative description from which a developer creates programming code.</p>	<p>The SMA uses standardized business rules definitions that reside in a separate application or Rules Engine. Business rules execute in a runtime environment. The SMA uses production or inference rules to represent behaviors (e.g., IF Then conditional logic). A rules editor maintains the</p>	<p>The SMA uses rules engine that utilizes technical call-level interface using Application Programming Interface (API) standard. The SMA uses Event Condition Action rules. The reactive rules engine detects and reacts to incoming events and process event patterns.</p>	<p>The SMA uses deterministic rules engine that utilizes domain-specific language involving multiple environments (e.g., Cloud Computing services). The rules engine tool generates automated testing scenarios and</p>

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rules consistently.		current version of standardized business rules definitions in a language that business people can interpret and transforms them into machine language to automate them.	The rules editor provides traceability, impact analysis, and capabilities so The SMA can evaluate changes across multiple areas. The SMA establishes an integrated environment for development, authoring, and testing. The SMA uses multiple methods for rule creation and management, including decision trees, scorecards, decision tables, formula builder, graphical decision flows, and customized templates.	enables analysts and developers to trace through execution paths for implementation verification. The SMA uses an open system for ease of integration with any computing environment. Rules engine accepts inputs from multiple databases, XML documents, Java objects, .NET/COM objects, and COBOL copybooks and integrates with various environments (e.g., HIX).
Logging (Business Results Condition and Reporting Condition)				
Stakeholders use log-on identification and password for access to system capabilities. The SMA manually conducts logging and analysis.	The SMA has access to the user's activity history and other management functions, including log-on approvals/disapprovals and log search and playback.	The SMA conducts user authentication using public key infrastructure in conformance with MITA Framework, industry standards, and other nationally recognized standards. The SMA uses role-based authorization to system resources using log-on	The SMA uses contemporary enterprise-based auditing tools such as, TrustedBSD, or OpenBSM to generate and process audit records.	The SMA uses open source components, such as, OpenXDAS.

MITA Technical Capability Matrix				
Level 1 Capabilities	Level 2 Capabilities	Level 3 Capabilities	Level 4 Capabilities	Level 5 Capabilities
credentials.				
Utility (Industry Standards Condition and Leverage Condition)				
<p>Business processes consists primarily of manual activity to accomplish unique tasks.</p> <p>The SMA conducts Research and Development experimentation where pilot project(s) are taking place using state-specific standards.</p> <p>The SMA uses minimal web service utility type services in isolated areas.</p>	<p>The SMA uses simple architected software services involving database integration and reliable messaging.</p> <p>The SMA introduces versioning, mediation, and distributed systems.</p> <p>The SMA integrates multiple applications. The SMA incorporates industry standards in requirements, development, and testing phases of projects including security measures.</p> <p>The SMA conducts initial performance management activities.</p>	<p>The SMA uses a set of computer programs to perform unique business and technical tasks.</p> <p>The SMA adopts business processes orchestration in an event-driven environment.</p> <p>The SMA does have transactions that take long time to execute.</p> <p>The SMA uses composite applications including initial external service enablement.</p> <p>The SMA uses SDLC governance activities.</p> <p>The SMA adopts all industry standards set by the HHS Secretary for requirements, development, and testing phases of projects.</p>	<p>The SMA uses measured business services involving business activity monitoring along with event-driven dashboard information.</p> <p>The SMA has multiple enterprises involving shared Business-to-Business services.</p>	<p>The SMA provides services to the stakeholder community to perform business functions without human intervention.</p> <p>The SMA implements self-correcting business processes.</p> <p>The SMA conducts real-time event stream processing to optimize service offering.</p>

Performance Monitoring

The MITA Framework aligns with IT Guidance architecture principles, requiring state system development and enhancement projects to define and conduct system performance monitoring:

- ❖ Ensure quality, integrity, accuracy, and usefulness of functionality and information.
- ❖ Provide timely information transaction processing, including maximizing real-time determinations and decisions.
- ❖ Ensure systems are highly available and respond in a timely manner to customer requests.

An example of business-driven performance monitoring methodology is the Federal Enterprise Architecture (FEA) Performance Reference Model (PRM) as shown in **Figure 7-1**. The PRM framework articulates the cause-and-effect relationship between inputs, outputs, and outcomes. The PRM includes associated integration of data collection for strategic performance standards, outcome analysis, and reporting. The PRM provides common output measurements as a way to correlate policy changes, program changes, and business process changes.

Do not confuse the PRM reference models with the MITA Framework. The PRM Business Reference Model (BRM) Levels 1-3 is not the same as the MITA Maturity Model Matrix maturity Levels 1-5.

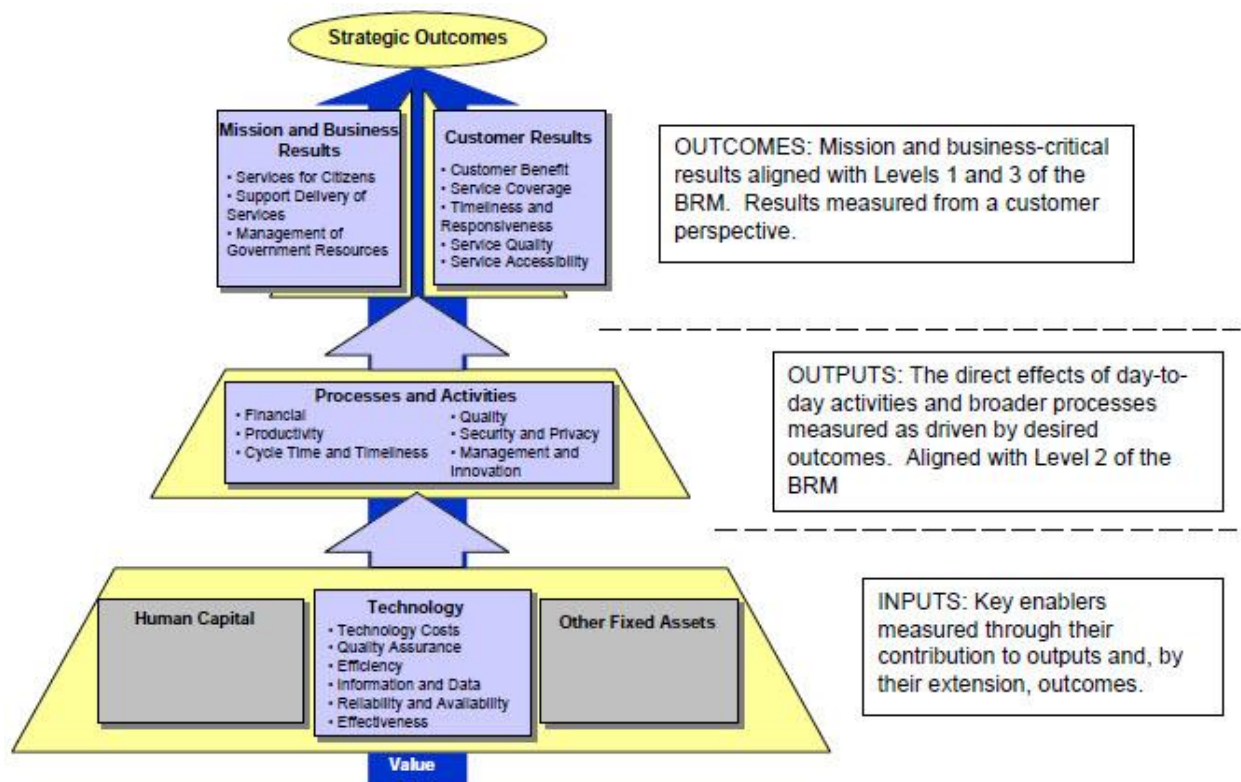


Figure 7-1. FEA Performance Reference Model Example

According to the *FEA Consolidated Reference Model Document Version 2.3*, October 2007, the PRM includes four (4) tiers structure around Measurement Areas, Categories, Groupings and Indicators. The following defines each hierarchy within the PRM framework:

- ❖ **Measurement Areas** – The high-level organizing framework of the PRM capturing aspects of performance at the output levels. This layer directly links to the performance objectives established at the agency and program levels.
- ❖ **Measurement Categories** – A collection within each measurement area describing the attribute or characteristic to measure.
- ❖ **Measurement Groupings** – Further refinement of categories into specific types of measurement indicators.
- ❖ **Measurement Indicators** – The specific measures (e.g., number and/or percentage of customers satisfied) tailored for a specific business reference model line of business of sub-function, agency, program, or IT initiative.

The PRM six (6) measurement areas include the following:

- ❖ Mission and Business Results Measurement Area
- ❖ Customer Results Measurement Area

- ❖ Processes and Activities Measurement Area
- ❖ Technology Measurement Area Human Capital Measurement Area
- ❖ Other Fixed Assets
- ❖ Human Capital

The MITA Framework provides guidance for a basic three (3) tiers performance monitoring structure that applies to the Business Process Template (BPT), Business Capability Matrix (BCM) and TCM. The measurement categories including the following:

- ❖ **Performance Standard** - A management-approved expression of the performance threshold(s), requirement(s), or expectation(s) that CMS expects States to meet to appraise at a particular level of performance.
- ❖ **Performance Measure** - Based on established Performance Standards and tracks past, present, and future business activity.
- ❖ **Performance Metric** - A measure of an organization's activities and performance also known as a KPI. Often closely tied in with outputs, performance metrics should usually encourage improvement, effectiveness, and appropriate levels of control.

Evolution of the Technical Capability Matrix

The Medicaid Enterprise is continually evolving as the Federal Government introduces new legislation and as technology evolves. Even as the State Medicaid Enterprise evolves, increased functionality, tighter performance standards, and expected health outcomes continue to change business operations and the technology used to conduct business. States do not have to achieve the higher levels of capability all at once for all technical services. The MITA Framework TCM encourages growth and transformation by illustrating the benefits of improving the SMA operations and provides tools to help the SMA achieve that transformation.

Using the Technical Capability Matrix

The TCM is a key tool for conducting the SS-A. The TA SS-A defines current State Medicaid Enterprise technical capabilities and develops the targeted future state of the enterprise with defined capabilities and performance standards. The SMA completes the TCM and develops a strategic plan for continuous improvement, targeting maturity levels 3 and 4. See the SS-A Companion Guide for more detail on the process. The SMA also completes and continues to make measurable progress in implementing its MITA Roadmap. For more information on the MITA Roadmap, see the SS-A Companion Guide.