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## ***Part III — Technical Architecture***

### ***Chapter 10 — Technical Architecture Summary***

#### **Introduction**

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The Medicaid IT Architecture (MITA) Framework 2.0 contains three interrelated parts: Business Architecture (BA), Information Architecture (IA), and Technical Architecture (TA). MITA is the combination of all the architecture models described in this document. This chapter summarizes the components of the Technical Architecture and links them to the other architectural elements of MITA. In the MITA Framework, the technical architecture provides the enablers for the business processes. The MITA technical architecture translates the conceptual and logical defined business processes and capabilities and translates them into logical services and infrastructure. The IA provides the mapping between the business information view and the technical data view.

The objectives of the summary chapter are to review:

- The purpose of the Technical Architecture
- The methodologies and tools used
- The components of the Technical Architecture and their interrelationships

This summary also answers the questions:

- What is the relationship of the Technical Architecture to the Business Architecture and the Information Architecture?
- How will the Technical Architecture be used?
- What are the next steps in developing the Technical Architecture?

#### **Purpose of the Technical Architecture**

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The purpose of the TA is to provide States and vendors with:

- A common vision of the future for all State Medicaid programs (i.e., principles, goals, objectives, and technical capabilities)
- A common logical infrastructure for Medicaid business processing and information exchange
- Common requirements for implementation (i.e., business services, technical services, and infrastructure)
- Standard reusable components (i.e., business and technical services)

- A repository of solutions (i.e., solution sets)
- A reference set of appropriate technical standards

This summary of Part III, Technical Architecture, reviews the tools and methodologies used, the TA components and their interrelationships, and the link between TA and the BA and IA. This summary concludes with a look at the road ahead.

## Methodologies and Tools

The TA uses complementary methodologies and tools to construct models of business processes and capabilities that represent the Medicaid program today and how it may evolve and be transformed in the future. These methodologies are borrowed from government and private-sector solutions and have been adapted to the multi-State Medicaid environment. These approaches are summarized below:

- **Service-Oriented Architecture (SOA).** The MITA has adopted SOA as the basis of its technical architecture. As a result, industry methodologies and tools for SOA will be used to support MITA.

The MITA Framework 2.0's TA has not selected any specific tools to manage the technical products (i.e., Web Service Definition Language [WSDL] definition, metadata, solution sets, list of technical standards). This will be done in a future MITA framework.

- **Web Service.** MITA services are central to MITA. MITA uses the same methodology to define MITA services as the industry has used to define Web services. The interface to all services will be defined using WSDL, and all messages and data will be defined in XML. This does not indicate that all MITA services are available as Web services, only that their interfaces are defined using the same mechanisms as Web services. *The business services define the business processes that must be exposed and defines their standard interfaces. Technical services define the technical functions that must be exposed and defines their standard interfaces.*

MITA services are implementation-neutral. Portions of the WSDL-defined interface are not defined as part of MITA but are left open for the States to complete once they decide on their architecture's physical implementation (i.e., endpoints). This provides States with the needed capability to adapt MITA to their specific physical implementation while still preserving MITA's goal of interoperability.

- **Technical Capability Matrix.** The technical capability results from applying the Maturity Model; Business Capability Matrix; and the technical principles, goals, and objectives to the individual technical functions. The Technical Capability Matrix

defines how a technical function will change as it matures over a 10-year period. The technical capability is measurable and provides descriptions of the function as it matures from one level to the next. *The Technical Capability Matrix allows States to determine the current level of maturity of a technical function and to chart a course for improving or transforming their maturity level in the future.*

## Technical Architecture Components

**Table 10-1** summarizes the results of using the methodologies described above.

**Table 10-1. Summary of the Components of the MITA TA**

Component	Description	Role in the IA
Part III Chapter 2 — MITA Principles, Goals, Objectives	A set of technical principles to guide the development of the MITA TA. These principles, along with the MITA business goals, are used to define a set of supporting technical goals — the MITA technical goals. The MITA technical goals have been further refined into a specific list of objectives — the MITA technical objectives.	Provide the basis and direction to all decisions related to the technical enablers of MITA.
Part III Chapter 4 — Business Services	A specific type of Web service that provides Medicaid-specific business functionality. Each business service represents a single business process at a single capability level. The service's interface is specified using WSDL.	Exposes business processes and capabilities with standard interfaces to the entire Medicaid enterprise.
Part III Chapter 5 — Technical Capability Matrix	The Technical Capability Matrix is a grid that shows each technical function as it may be transformed over time due to changes in business requirements or in technology.	Each technical capability at each level is traceable to either the Business Capability Matrix or the technical principles, goals, and objectives.
Part III Chapter 6 — Technical Services	A specific type of Web service that provides non-Medicaid-specific technical functionality. These functions can be thought of as system level or utility functions. An example of this type of functionality would be a technical service that provides an authorization or encryption functionality. Each technical service represents a single technical function at a single capability level. The service's interface is specified using WSDL.	Technical functions and capabilities with standard interfaces to the entire Medicaid enterprise.
Part III Chapter 7 — Application Architecture	Application architecture defines the relationship among the various services and provides an infrastructure that allows them to execute. This infrastructure includes mechanisms to orchestrate the processing flow and workflow. A couple of key components of the application architecture are the enterprise service bus and service management engines.	Defines the overall technical structure of a Medicaid enterprise and provides the infrastructure that allows all of the components to operate successfully.
Part III Chapter 8 — Technology Standards	A set of technology standards to be used in defining the various components of the technical architecture.	Aligns MITA with the other government and industry initiatives and standards.

Component	Description	Role in the IA
Part III Chapter 9 — Solution Sets	A description using a standard template of the physical implementation of a service. These templates define the metadata required to describe a specific implementation of a service. Each service may have one or more solution sets based on the actual physical implementations. This could be due to different technologies used for implementation (i.e., .NET or J2EE) or different performance characteristics of the service (one implementation could handle very high volumes at a high cost, while a second implementation could handle moderate volume at a lower cost).	Provide a resource for sharing physical implementation among States.

Figure 10-1 shows the interrelationships among the TA components.

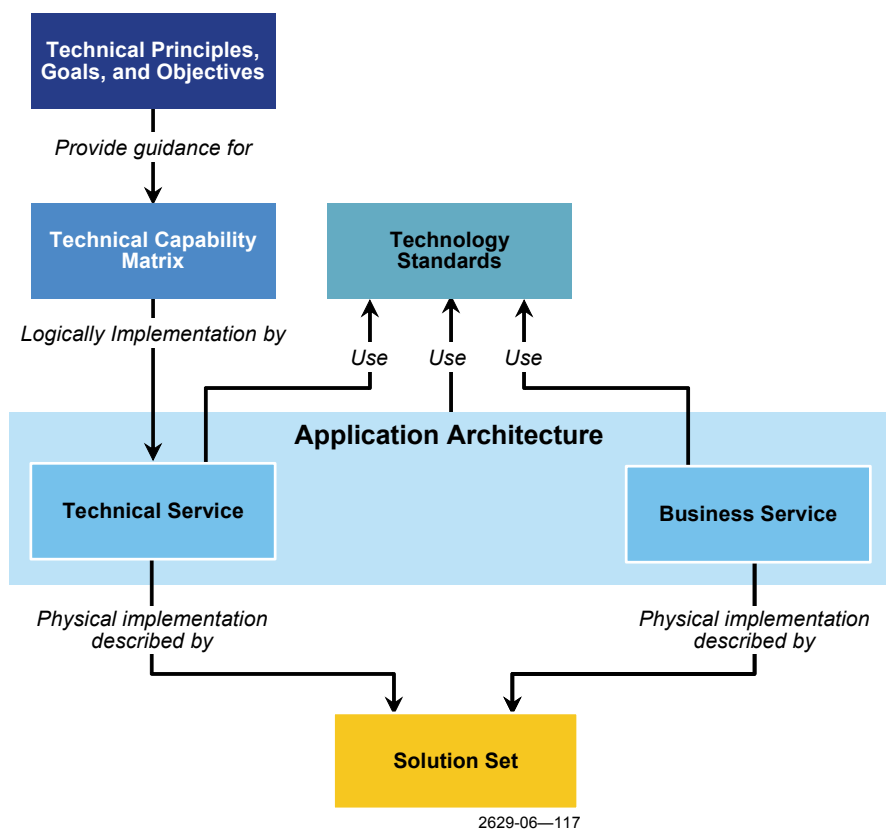


Figure 10-1. TA Components

In summary, the seven Technical Architecture components provide an integrated logical architecture that provides the standardization, interoperability, and flexibility required by the various State Medicaid enterprises.

- **MITA Principles, Goals, and Objectives** provide the vision and guidance for the MITA Technical Architecture.
- **Business Services** logically define a service that provides Medicaid functionally based on MITA business processes and business capabilities.
- The **Technical Capability Matrix** takes the Business Capability Matrix; MITA principles, goals, and objectives; and the technical functions and populates a grid to demonstrate how each area can evolve. In some cases, the technical area will be replaced by a new technical area.
- The **Technical Services** logically define a service that provides technical functionality that enables the MITA business services to operate successfully. This functionality is at the level of non-Medicaid-specific functionality and can be thought of as system, utility, or common services.
- The **Application Architecture** defines the environment in which the services will be operating. The Application Architecture also provides the infrastructure for orchestrating the flow of information between the appropriate technical and application processes.
- **Solutions Sets** provide a resource for States to determine the reusability of MITA services (business and technical) and infrastructure components.
- The **Technical Standards** are a set of standards related specifically to technology that represents MITA recommendations for State implementations. This will allow the State implementations to be compliant to industry standards and to enable interoperability of the Medicaid enterprise.

## What Is the Relationship of the Technical Architecture to the Business and Information Architectures?

As shown in **Figure 10-2**, the TA has a mandatory relationship with the IA. The TA describes the technology enablers that are associated with different levels of maturity. In the MITA Business Process Model, each business process is defined along with data input, data output, and shared data required. These are stated at a high level. The business capability description for each business process also defines conceptually how data will be transformed to achieve higher levels of maturity.



**Figure 10-2. MITA Framework Architecture Relationship Diagram**

### ***Link to the Business Architecture***

The TA uses the business architecture to define what business services need to be developed based on the Business Process Model and Capability Maturity Matrix. The technology areas are derived from the requirements of the business processes and the MITA principles, goals, and objectives. An iterative process is used to align the dependent capabilities and levels between the Business Capability Matrix and the Technical Capability Matrix. The business services are directly mapped to the definition of the business process and its capability. This definition defines the service interface, business logic, and shared information requirements. The solutions sets represent the physical implementations of the business processes described in the business process model.

### ***Link to the Information Architecture***

The TA requires a companion IA. The Information Model is used to translate and define the information needs of the BA into the data specifications of the TA. The IA also provides the vision and guidance for information management that will be implemented in the technical functions and technical capabilities. The data portions of the service specification will be derived from the MITA Logical Data Model.

## **How Will the Technical Architecture Be Used?**

States, the Centers for Medicare & Medicaid Services (CMS), vendors, legislators, and others will use the TA components to plan for improvements in the State Medicaid program — both in the delivery of services to providers and in its internal operations and exchanges of information with the other external parties. **Table 10-2** summarizes how stakeholders will use the TA.

**Table 10-2. Stakeholder Use of the Technical Architecture**

Stakeholder	How Technical Architecture Is Used
State Medicaid Agency	<p>It is anticipated that States will participate in workgroups defining and maintaining the MITA TA. A State would use the MITA repository to determine whether a service or infrastructure already exists and can be used for their specific implementation. This would reduce the risk, and potentially the cost, of their implementation. The TA will also be used in the Advance Planning Document (APD) process to define what the State is planning to develop. As the details of the TA are defined, they will be available to be used by the States as requirements in their RFPs.</p> <p>Initially, States may request vendors to supply WSDL and/or capabilities for proposed services. These proposals would then be submitted to be included in the MITA repository.</p>
CMS	The CMS State Operations Division of State Systems provides leadership in establishing the MITA guidelines and promoting them among States. Through the release of the MITA Framework documents, special workshops with States, Medicaid conference material, and working with early adopter States, CMS is creating the standards that Medicaid programs will have to meet in the future.
Vendors	The vendor community can use the MITA Framework as a reference in planning their research and development activities. They will use the TA, in particular, to determine what services need to be developed as well as the specific interface requirements for that service. The TA also provides the description of how the services are linked together and the underlying infrastructure required. They will have a common understanding of direction envisioned by CMS, and they can show how their products align with the MITA business and technical capabilities. Initially, vendors will supply States solution sets, using the MITA template, describing their specific implementations. These solution sets will then be submitted by States to MITA for inclusion in the MITA repository. Vendors may also be asked to participate in workgroups defining the WSDL interfaces for the MITA services.
Providers	Providers will play an active role in the exchange of information with States in the future. This exchange will be based on the definitions of the various business and technical services. They can look at the TA to understand what direction the Medicaid payer agency is taking and to keep this in mind as they invest in IT upgrades and reengineer their practices.
Legislators, Governors	States can develop presentations based on the TA to show the governor and legislators what goals CMS is establishing for States that request enhanced funding.
Other Payers and Other Agencies	Other payers and other agencies are invited to review the MITA Framework, especially the TA, to learn about the Medicaid plans for transformation. CMS envisions that other agencies and payers will collaborate increasingly with Medicaid to come up with a “one-stop shop” for basic functions such as enrollment and coordination of benefits.

In general, MITA predicts that stakeholder roles and access to information will improve over time; technology will eliminate most manual activities; and that the State Medicaid agency, CMS, and providers will witness a transformation of the Medicaid business and technology over the next decade.

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## What Are the Next Steps in Developing the Technical Architecture?

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MITA Framework 2.0 delivers the starter kit for a controlled State Medicaid transformation. MITA will always be a work in progress. In the years ahead, CMS envisions significant collaboration between Federal and State authorities to refine and improve the business services. Technical functions, technical capabilities, technical services, and the Application Architecture are contained in Framework 2.0. State participation is critical to the success of MITA. CMS envisions that teams of States will select various subsets of technical components, refine the activities, and standardize the information exchanges. From this activity will come model business and technical services that States and vendors will develop. The service defines the input and output but not the inner workings of the process. However, the business community must still decide the requirements for standardized Triggers and Results. The CMS MITA team will continue to support State efforts by serving as a conduit for improvements to MITA models that all States and vendors can access.



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Workgroups will be needed to define technical functions business processes and then tackle the technical capabilities. Technical capabilities will require detail in terms of measurable qualities, such as timeliness, efficiency, efficacy, and satisfaction.

In the end, the MITA Framework 2.0 and the TA are about *change* so that State Medicaid agencies can continuously improve the way they deliver services to beneficiaries and providers, account for outcomes, reward participants based on performance, and respond dynamically to requests for information.