MITA Information Series

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CMS CENTERS for MEDICARE & MEDICAID SERVICES

What is MITA? An Overview

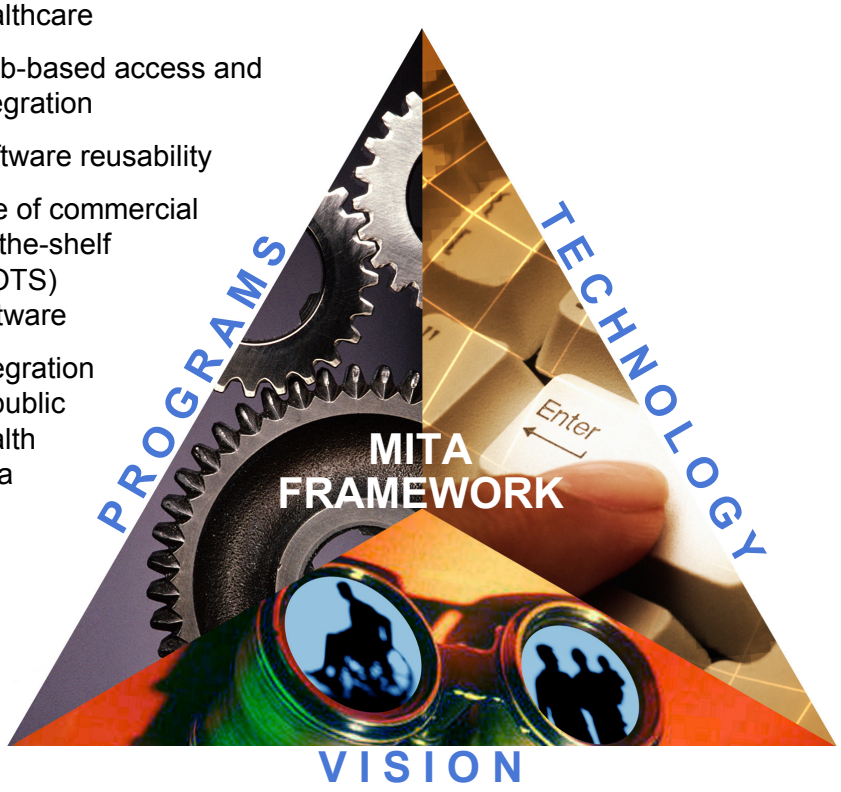
This synopsis of the Medicaid Information Technology Architecture (MITA) is the first in a series of informative briefs describing the technical and programmatic aspects of the MITA program.

Overview

The Medicaid Information Technology Architecture (MITA) is an initiative of the Center for Medicaid & State Operations (CMSO), and it is aligned with the National Health Infrastructure Initiative (NHII) (http://aspe.hhs.gov/sp/nhii/).NHII is a voluntary network comprising clinical, public health and personal health knowledge-based information systems that make health information available as needed to improve decision-making. MITA is intended to foster integrated business and IT transformation across the Medicaid enterprise to improve the administration of the Medicaid program. Its common business and technology vision for state Medicaid organizations will emphasize:

MITA Framework Approach

- A patient-centric view not constrained by organizational barriers
- Common standards with, but not limited to, Medicare
- Interoperability between state Medicaid organizations within and across states, as well as with other agencies involved in healthcare
- Web-based access and integration
- Software reusability
- Use of commercial off-the-shelf (COTS) software
- Integration of public health data



Medicaid Mission

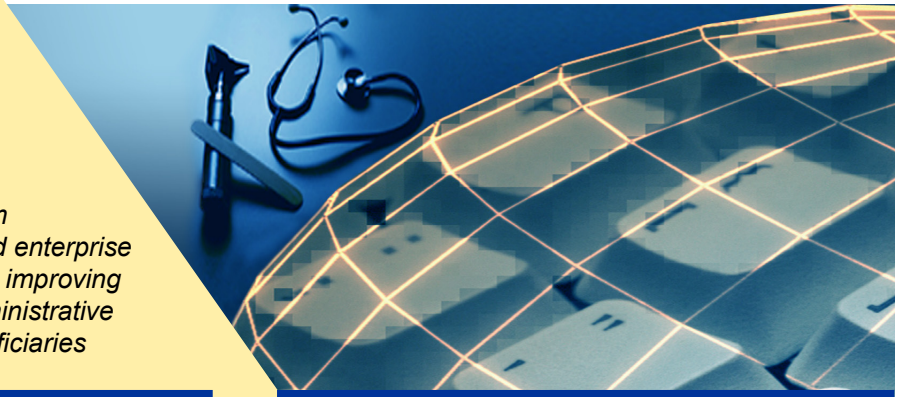
Provide quality health care to members by providing access to timely and cost-effective services

Medicaid Goals

Improve health care outcomes for Medicaid beneficiaries and ensure efficient, effective, and economical management of the Medicaid program

MITA Mission

Establish a national framework of enabling technologies and processes that support improved program administration for the Medicaid enterprise and stakeholders dedicated to improving healthcare outcomes and administrative procedures for Medicaid beneficiaries



MITA Goals

- Develop *seamless and integrated systems* that effectively communicate, achieving common Medicaid goals through interoperability and standards
- Promote an environment that supports *flexibility, adaptability, and rapid response* to changes in programs and technology
- Promote an *enterprise view* that supports enabling technologies aligned with Medicaid business processes and technologies
- Provide *data that is timely, accurate, usable, and easily accessible* to support analysis and decision making for health care management and program administration
- Provide *performance measurement* for accountability and planning
- Coordinate with Public Health and other partners and *integrate health outcomes* within the Medicaid community

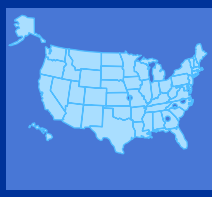
MITA Objectives

- Adopt data and industry standards
- Promote secure data exchange
- Promote reusable components through modularity
- Promote efficient and effective data sharing to meet stakeholders' needs
- Provide a beneficiary-centric focus
- Support interoperability and integration using open architecture standards
- Promote good programmatic practices, such as the use of the Software Engineering Institute's Capability Maturity Model (SEI CMM), as well technical practices such as the use of a data warehouse to separate on line analytical processing (OLAP) from on line transaction processing (OLTP)
- Support the integration of clinical and administrative data to enable better decision making
- Break down artificial boundaries between systems, geography, and funding (with the Title XIX program)

MITA Definition

MITA is intended to foster integrated business and IT transformation across the Medicaid enterprise. It will establish national guidelines for technologies and processes that can enable improved program administration for the Medicaid enterprise. Medicaid communities want to ensure that the mission and goals of the Medicaid program are met. The MITA initiative includes an *architecture framework*, *processes,* and *planning guidelines* for enabling state Medicaid enterprises to meet common objectives within the framework while supporting unique local needs.

- *The MITA architecture framework* is a consolidation of principles, business and technical models, and guidelines that combine to form a template for the states to use to develop their own enterprise architectures.

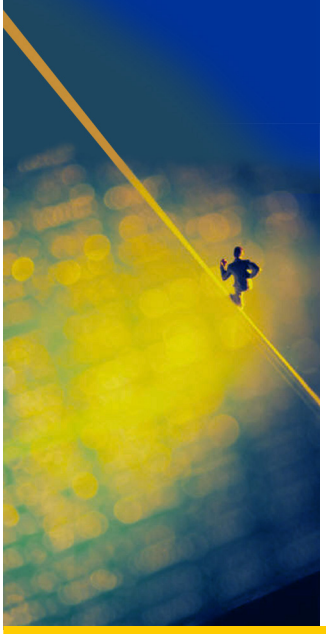


- *MITA processes* provide guidance for state Medicaid enterprises to use in adopting the MITA framework through shared leadership, partnering, and reuse of solutions.

- *MITA planning guidelines* help states to define their own strategic MITA goals and objectives and to develop tailored enterprise architectures that are fully consistent with the CMSO expectations. In the future, these guidelines will serve as the basis for states' requests for appropriate Federal Financial Participation (FFP) for their Medicaid Management Information Systems (MMIS).

The MITA journey is just beginning. This initial version of the MITA framework will evolve and grow with the participation and help of Medicaid stakeholders and partners.

MITA Challenges



Medicaid programs have become highly complex, multibillion-dollar enterprises in most states. They are major economic engines — collectively drawing more than $180 billion in federal funding each year to local economies. Medicaid is typically the largest or second largest budget item in each state and has gained enormous political visibility. The MMIS contract is typically the largest services contract let by state government and, in many cases, has also attracted intense public scrutiny.

Historically, MMIS was designed primarily as a financial and accounting system for paying provider claims accurately and timely. Yet, as the Medicaid program has grown more complex, the MMIS systems needed to support the Medicaid enterprise have also grown in number and complexity. MMIS — once defined as a single, integrated system of claims processing and information retrieval — is being redefined under MITA as the new "virtual MMIS" to most, if not all, of the additional non-financial Medicaid systems running on multiple hardware and software platforms.

When Medicaid functions (such as managed care, clinical support, data analysis, fraud management, non-emergency transportation coordination, prior authorization, etc.) were automated, they usually were added as separate systems cobbled together with the MMIS or, in some cases, hard-coded into the MMIS. As a result, these systems could not communicate directly and exchanged information with difficulty, often losing information. It usually was not possible for Medicaid administrators to obtain an hourly consolidated overview of all provider and recipient activity because of this fragmentation (e.g., a prior authorization authorizer might not be able to see all outstanding authorization requests, including dental, pharmacy, hospital, DME, and physician, to understand an individual's total program involvement).

These special purpose "best-of-breed" systems might require up to a dozen different servers and user support systems (e.g., separate applications and call centers for provider services, recipient services, enrollment broker, pharmacy benefit management clinical help desk suppot, data warehouse support, desktop support, non-emergency transportation (NET) support, fraud hot line, prior authorization support, etc.). Each separate platform might have its own unique and usually proprietary architecture, data standards, update cycles, and work flow requirements.

There are situations where a state's MMIS might process most claim types under one architecture and one data standard, but other claims types (such as dental and pharmacy) might be processed through stand-alone systems, each with its own architecture and data standards. Formats for names, addresses, dates, and code sets for

gender, location, provider, and recipient might be stored three different ways and have three different meanings just in the three separate claims processing systems (e.g., gender code might be 1, 2, or 3 in one system and M, F, or U in another). Translating these to one standard for users and then merging all the data into the data warehouse for MARS and SUR reporting, profiling and trend analysis, and pattern recognition can be very difficult; and severe compromises can occur in data comparability and usability.

MITA is intended to help the MMIS become the “central information nervous system,” supporting the entire Medicaid Enterprise in a standard way. A universal data dictionary and standard definitions of common data elements will help MMIS transcend platforms. Using "best of breed" systems for special purposes requires that these individual systems be compatible with the MMIS's data and architecture standards so they can communicate directly with each other and the resulting processed data will be meaningful when merged into operational data stores.

How Will MITA be Used?

CMS will use MITA as a tool for communicating a common vision for the Medicaid program and for providing guidance on achieving that vision. CMS will use an updated advance planning document (APD) review process and criteria to ensure that state IT planning meets MITA goals and objectives. Details about the new review criteria will be developed by interacting with the first states to adopt MITA. Examples of possible additions to the APD are to:

- Demonstrate that planned enhancements support state and Medicaid strategic goals
- Describe how intra-state systems other than the MMIS have been considered in developing the solution
- Document their analysis of alternative solutions—particularly a review of solutions implemented in other states that might be considered valuable
- Describe data sharing components of the solution or justify reasons for not including data sharing solutions at this time
- Justify maintenance costs that exceed certain thresholds vs. cost of enhancements that could reduce maintenance costs

States

MITA will change the way states design and build, change, or modify their Medicaid systems and the manner in which states perform IT investment planning. In the future, states will need to ensure that their business goals and objectives meet the MITA goals and objectives. To implement the MITA framework, states will choose the elements of the MITA framework that best meet their strategic and tactical IT goals and objectives, and their choices should be reflected in their APDs. CMS recognizes that different states have differing needs and are likely to begin their participation at different points. The MITA framework can accommodate an implementation path best suited to each state's individual situation.

To ensure that MITA meets the ongoing changing needs of the state Medicaid participants, states can help refine the MITA framework models. States may collaborate on joint projects to develop and implement shareable, reusable IT components and business processes. State participation will help shape the Medicaid systems of the future.

Vendors

Vendors will use MITA to shape their product offerings to enable services to be leveraged and reused across states.

MITA Benefits to Stakeholders

MITA will provide significant benefits to Medicaid stakeholders, including the benefits to the public, states, and federal government.

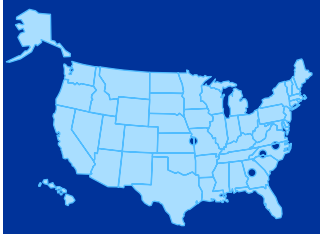
Public

Greater beneficiary access to quality care. MITA can enable the management of Medicaid programs to identify and target at-risk populations and to collec and publish point-of-care quality statistics for improved patient safety.

Greater choice and independence for beneficiaries.
Improved state-to-state or intra-state analysis of provider performance can lead to better quality care and increased knowledge to promote choice and independence for beneficiaries.

Improved public health outcomes. MITA provides greater access to both clinical and administrative data to support research, improve public health surveillance and alerting, and permit early detection of and response to bio-terrorism attacks.

States



Improvements in the management of the Medicaid program. States will have better access to a wider range of accurate and timely data. A state can share this data within itself, with other states, and with federal agencies through efficient and secure data exchange. State Medicaid systems will have greater adaptability and flexibility to respond to changes in legislation, court orders, and policies and will be able to support broader analysis of program needs and measurement of health outcomes.

Improved return on state IT investment. The MITA framework provides a common direction for the future development and evolution of state MMIS. This common direction will result in a better return on IT investment through reusable system components, adherence to common standards, and improved coordination and alignment with national health initiatives.

IT alignment with Medicaid priorities. MITA promotes the alignment of each state's individual business goals with its IT strategies through enterprise architecture. This approach will also allow better coordination with the state's enterprise architecture.

Federal Government

Improved CMS review of state Medicaid IT plans and systems. The MITA framework establishes criteria for guiding states' APD development, including the components that reflect MITA goals and objectives. CMS Regional Office staff will use the same criteria for a consistent review of states' APD submissions.

Improved strategic planning and policy formulation. The MITA framework fosters sharing of timely, accurate, usable, easily accessible, and secure information among states and federal agencies, and it provides the necessary insights into the national trends and needs of the Medicaid-eligible and -provider populations.

Alignment with national health information initiatives. The MITA framework supports and incorporates the principles of national initiatives, especially those that support improving public health data quality.

MITA's Guiding Principles

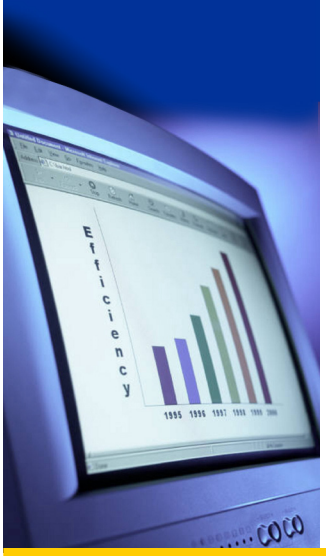
MITA represents a business-driven enterprise transformation. MITA is firmly grounded in enterprise architecture principles; MITA defines a business transformation over a 5-year and long-term (10 years and greater) timeframe, and defines a technical architecture and a transition strategy to enable the business transformation. This approach, which is common today across industries as diverse as financial, transportation, and defense, will enable states to align IT solutions with their common and unique business needs.

MITA will support the following categories of business needs facing state Medicaid organizations:

- State needs
  - ✓ Align with the state's strategic goals
  - ✓ Align with the state's enterprise architecture
- Medicaid-wide goals
  - ✓ Align state approaches among states
  - ✓ Align state approaches with national direction
- National goals through MITA alignment with national initiatives and international standards

Commonality and differences co-exist. The MITA architecture defines processes, data, and technical solutions that are common to many state Medicaids with the provision for adapting and extending them to meet state-specific needs. Identifying common business processes enables the definition and reuse of common solutions, making it possible for states to share development costs. The structure of the MITA models and templates capture and represent these differences and accommodate cost-effective implementation of state-specific needs by using common solutions.

States will participate in the development of the MITA models and templates, allowing for commonality and difference to be appropriately represented. They will agree on suitable common approaches, such as the need to share data, develop end-to-end processes that connect organizations, and reuse or repurpose technical solutions. They will agree to differ where appropriate, such as in supporting state-specific needs or in promoting creativity and innovation. States will be encouraged to collaborate to create technical solutions that support variations, such as adapting or extending solutions. For example, there should be one set of data validity edits and one set of business rules for processing transactions used by multiple input sources (e.g., POS, Internet, direct data entry, key entry, EMC, etc.). All business rules and adjudication logic should be easy to modify or extend through the use of mechanisms like table-driven design or business rules engines.



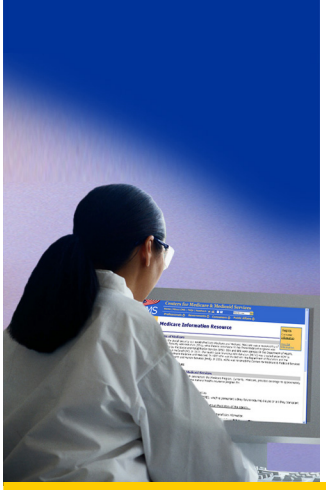
This approach seeks to achieve a balance between commonality and differences that enables standard mechanisms for interoperability and data exchange. The goal is to maximize the benefit across the Medicaid enterprise, while promoting innovation and creativity in local implementations.

Emphasis on standards. MITA will promote the use of data and technical standards to improve the cost-effectiveness of IT development. The use of data standards provides better access to data by promoting data consistency and enhanced sharing through common data access mechanisms. Adherence to technical standards, specifically open standards, facilitates integration of COTS solutions and the reuse of solutions within and among states, resulting in lower development costs and risks.

To the greatest extent possible, MITA will rely on both national standards for health and data exchange and open standards for technical solutions. Where Medicaid-specific standards are needed, MITA will foster agreement within the Medicaid community and, if appropriate, submit standards to national standards bodies.

Some specific opportunities for applying standards in the MITA architecture include:

- All functional modules should be designed for component reuse and interoperability. A module from one vendor should be replaced easily by an equivalent functional module from another vendor (e.g., the data warehouse module from Vendor A can be easily replaced by the data warehouse module from Vendor B).
- All systems should use open, non-proprietary file structures that can be accessed by any other MMIS module or reporting system.
- There should be one universal data directory with clear, unambiguous definitions and formats for each data element (e.g., names, addresses, dates, and special code sets for sex, location, eligibility category, patient status, and procedure/diagnosis code).
- All data structures and system architecture should be based on relational database management system (RDBMS) design and open n-tier architecture standards.
- To the extent possible, multiple databases with similar data from different sources that feed the MMIS should be standardized and concatenated into master records (e.g., multiple sources of eligibility information should be consolidated around a single, permanent identification number in an eligibility hub). The same is true for multiple sources of accounts receivables (adjustments, TPL recoveries, SUR recoveries, drug rebates, etc.).



Built-in security and privacy: Key security and privacy principles include:

- Security and privacy capabilities are defined and woven throughout the architecture. Access requirements are identified in the business processes, defined within the data models, and implemented through the MITA technical models.
- The MITA architecture provides the capabilities to protect the Medicaid enterprise against known threats and, through evolution of the MITA architecture, readiness to respond to new threats.
- Security is defined in the data models:
  - Access rights specified by role and by data element.
  - Tagging of private data.
  - Linking of use of data with data query definition.
- Security is implemented in models using:
  - Configuration tools.
  - Business application functionality linked to common security mechanisms.
- A single security sign-on to all systems supporting the Medicaid enterprise.

Data consistency throughout the enterprise: MITA will ensure, to the maximum extent possible, that the number of copies of a data element is minimized; and multiple copies, if they must exist, are synchronized in a timely manner; and that the official data of record is always available. For example, it is recognized that OLAP requires a different database organization and architecture than continuous OLTP, and it may be desirable to have different hardware/software platforms and data stores for the claims and transaction processing engine and the data warehouse.

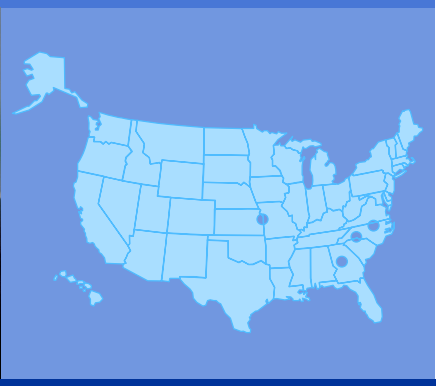
The data warehouse should always balance with and be synchronized with the transaction processing engines that feed it. For example, actual dollars claimed by a state on MARS reports should balance with funds actually paid out by claims processing.

MITA Artifacts and Their Relationships

The Key MITA artifacts are:

- Architecture Framework
- Processes
- Guidelines

Key MITA Artifacts



Architecture Framework	Processes	Guidelines
➢ Business architecture ➢ Technical architecture ➢ Cross-cutting architecture	➢ Transition and implementation planning ➢ Advance planning document (APD) process ➢ Shared responsibility and commitment ➢ Management of working groups ➢ Change management	➢ IT portfolio management ➢ State Medicaid enterprise architecture development ➢ MITA solution sets ➢ Transition strategy

Architecture Framework

The MITA architecture framework comprises three sets of artifacts:

- Business architecture
- Technical architecture
- Cross-cutting architecture

Business Architecture

The MITA business architecture describes the current and future business operations of a state Medicaid organization. It includes an operations concept, business process model, and business capabilities. The MITA business architecture enables a state to define a target business vision, business processes, and capabilities to use for defining its target technical architecture.

Technical Architecture

The MITA technical architecture includes a data architecture, an application architecture, and a technology architecture. Collectively, they define a set of technical services and standards that a state can use to plan and specify its future systems.

Cross-Cutting Architecture

The cross-cutting architecture includes services that span both the business and technology architectures. Services in this category include flexibility, security, and privacy.

Processes

MITA processes provide structured approaches for a state to plan and implement its transition to the MITA architecture. The initial set of processes includes:

- Transition and implementation planning
- APD process
- Shared responsibility and commitment
- Managing working groups
- Change management

Transition and implementation planning enables a state to define its target business architecture and capabilities and to develop a phased plan to achieve the target state. The APD process describes the MITA-based approval criteria for APDs, and the approach for a state to use in developing its APDs.

MITA implementation will require the collaborative efforts of stakeholders. The shared responsibility and commitment process defines the MITA governance structure and procedures necessary to achieve the needed stakeholder participation for the MITA program's success. A key aspect of MITA governance is the formation and conduct of working groups that enables states to collaborate on solutions. The managing working groups process defines the structure of working groups and the process governing their operation. Finally, the change management process describes the organization structure and procedures for configuration management of MITA artifacts.

Guidelines

MITA guidelines provide a state with recommendations and best practices in support of implementing the MITA transition and implementation planning process. The guidelines include:

- IT portfolio management
- State Medicaid enterprise architecture development
- MITA solution sets
- Transition strategy

IT portfolio management provides each state with a recommended approach and criteria for evaluating its IT applications. State Medicaid enterprise architecture development describes a recommended approach for a state to develop its Medicaid enterprise architecture so that it is consistent with MITA and the enterprise architecture developed by the state CIO's office. The transition strategy describes best practices for migration from legacy business and technical architectures to the MITA architecture.

MITA Technical Architecture Features

The following are the key features of the MITA technical architecture:

- Service-oriented architecture
- Common interoperability and access services
- Adaptability and extensibility
- Hub architecture
- Performance measurement

Service-Oriented Architecture

A service oriented architecture (SOA) is a software design strategy in which common functionality and capabilities (utility services) are packaged with standard, well-defined "service interfaces" that provide functionality that is formally described and can be invoked using a published "service contract." Users of utility services need not be aware of "what's under the hood;" a utility service can be built using new applications, legacy applications, COTS software, or all three. Utility services will be designed so that they change to support state-specific implementations.

(Note: The MITA term "utility services" represents the more commonly used architectural term "services" inherent in an SOA. MITA uses the term "utility services" to avoid confusing this technical concept with "Medicaid program services" or "services to beneficiaries.").

Common Interoperability and Access

Utility services make it possible to implement common interoperability and access. Interoperability refers to system-to-system communication, and access refers to system-to-person communication. For example, personal digital assistant (PDA) access could be provided to multiple applications, or conversely, a single application could allow access from multiple devices: Web interfaces, PDAs, kiosks, or voice response systems.

Adaptability and Extensibility

Adaptations allow a state to change the specifics of processes, data, or technical solutions using configuration files to meet its specific needs. Extensions allow states to add new functionality and capabilities. Both characteristics build in the capabilities needed to accommodate both common needs as well as each state's unique needs.

Hub Architecture

The hub architecture facilitates data exchange and data sharing while allowing each organization control and ownership of its own data. Hubs, unlike data marts and data warehouses, do not require the data to be moved to a central location. Data will be described using standard definition formats that map the data to standard data elements where appropriate, and provide the data descriptions when the data elements are non-standard. Security and privacy access rules for each data element will be represented in a standard way. A collection of utility services at hubs will read the data descriptions and the security and access rules and use that information to "expose" the data to users who qualify for access and to receive and process their queries.

Performance Measurement

The use of standards and agreement on a set of common business processes and data standards make it possible to develop performance metrics, measurement techniques, and corresponding utility services. Performance metrics make it possible to track changes in programs and policies and evaluate corresponding changes in health outcomes, measuring business performance across the Medicaid enterprise.

Next Steps

Today's MMIS has come a long way since its inception in the 1970s. We have been at work on MITA for little more than 2 years. While we do not envision this development process lasting another 30 years, we realize that for MITA to achieve its ambitious goals, it will take time, hard work, and tremendous collaboration among Medicaid stakeholders, including the public sector, IT industry, providers, and beneficiaries.

Our approach will be to test products with our state partners as they become available in the field. We will incorporate creative solutions to advance the goals of MITA. We will call attention to some successful implementations (e.g., early adopter states), which others may use as a model and for their "best practices." As MITA evolves, we will use its principles as key criteria for CMS officials to use in their review and approval of federal financial participation (FFP) for the MMIS systems of the future. We will incorporate these standards into the Federal MMIS Certification Review criteria as benchmarks to measure progress from today's transaction-based MMIS systems to enterprisewide, patient-centric MMIS systems.

Finally, an important aspect of MITA's development is for us at CMS to continually improve the effectiveness of our communication. We would greatly appreciate your feedback on this paper. Did you find it useful? If not, why not? What can we do better in the future?

For further information, please contact:

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Thank you for your interest.