

Alabama Medicaid Management
Information System (AMMIS)
Concept of Operations
(ConOps)



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1 INTRODUCTION

Alabama Medicaid (hereafter referred to as the Agency) developed this Concept of Operations (ConOps) document for the Alabama Medicaid Management Information System (AMMIS). The current AMMIS is a version of the fiscal agent's InterChange system, which is a monolithic type system that was implemented in 2008 and certified in 2009. The AMMIS is maintained by the fiscal agent except for the subsystems listed below. These subsystems are managed by external vendors that primarily interface using direct data entry or batch processes:

- Electronic Visit Verification (EVV) services for Home and Community Based Services (HCBS) Waivers plus Long Term Care (LTC) & Supports

- Third Party Liability (TPL) processing is shared between the fiscal agent and another vendor

- Prior Authorization (PA) services are provided by several different vendors

The Project Partnership Understanding (PPU) transition plan was approved by the Centers for Medicare and Medicaid Services (CMS) in June of 2018. This document defined the Alabama Medicaid Modularity Initiative (AMMI) project, steps, structure, and goals. It was initially developed early in the Medicaid Enterprise Systems (MES) Modularity Program with the initial focus on laying the groundwork for this transition. The document provides a proposed approach to modularization with the approach being finalized by the Agency working with the Program Management Office (PMO) Services team and the System Integration (SI) team.

The first step was an AMMIS Take-Over contract that was executed in early 2020. The AMMIS takeover contract allows the fiscal agent vendor to continue to run the legacy AMMIS for seven (7) years, which is the maximum time allowed by the State of Alabama. This provides a stable environment to ensure current operations are not disrupted as the Agency moves forward to decouple specified functions and define a new AMMIS. The new modular version of the AMMIS will be the MES, which will raise Alabama Medicaid's Information Technology (IT) to a new plateau.

2 REFERENCED DOCUMENTS

The following documents were referenced in the development of this document:

- Alabama Medicaid PPU
- AMMIS Request For Bid (RFB)
- Alabama Medicaid Program Management Office (PMO) Services Request For Proposal (RFP)

3 CURRENT SYSTEM

The current AMMIS is composed of an n-tier web-based user interface with batch processes. It has been operational since February of 2008. There are several ancillary systems for things such as document management, workflow management, optical readers, letter generation, Electronic Data Interchange (EDI), Voice response systems, etc. The AMMIS and ancillary systems are primarily supported by the fiscal agent. The fiscal agent provides the following functions:

Administration – quality assurance, privacy and security

Operations/Claims – mailroom, data entry, drug rebate, medical policy, financial services

Customer Relations – provider services, provider call center services, recipient call center services, provider enrollment services

Systems and Local Area Network (LAN) Operations – maintenance and modification of the AMMIS, system administrators, data base administrators, and desktop user support

3.1 Functional Description

The AMMIS is composed of different software components which are loosely coupled and arranged in various software and architectural patterns to enable ease of use, development, and maintainability.

The AMMIS includes benefit plan processing along with an n-tier architecture. The system is based on business processes and the data is organized to support these processes. It is feature-rich and centers on a Medicaid-specific relational data model. It divides the application into components able to process on different networked computers. This design and supporting architecture allow for flexibility and scalability. The following AMMIS subsystems support business processes of the Alabama Medicaid Agency:

The **Automated Voice Response System (AVRS)** gives healthcare providers access to information including check amount, claim status, third party resources, procedure and drug code pricing, prior authorization requirements, and recipient household information. It offers an automated method for providers to verify Medicaid recipient eligibility coverage. In addition, it allows Medicaid recipients to check their eligibility, check a claim status, access frequently asked questions, and request an application to apply for Alabama Medicaid.

The **Case Management (CM)** subsystem accepts case management activity records from external entities. The subsystem processes, edits, and adjudicates activity records in accordance with State requirements between designated hours. On a Monthly basis, the subsystem produces case management activity payments and related reports. CM activity records with associated adjudication information are available for vendor viewing via the web portal. The CM subsystem uses data from other subsystems in its processing.

The **Case Tracking** subsystem provides the tools for managing Surveillance and Utilization Review cases as well as for Case Management. This includes case creation, tracking activity on active and under review cases, and monitoring to case closure. The CaseTracker Plus case tracking tool is currently provided and maintained by Pondera. Workflows are self-contained within the tool. Scheduling and correspondence are managed outside of the tool.

Claims processing functions ensure claims for eligible recipients, received from enrolled providers for covered services, are accurately processed and adjudicated in accordance with State and Federal requirements. It edits claims and initiates reimbursement. The subsystem includes the adjudication of batch, Web Portal, and pharmacy point-of-sale claims, and produces related reports and extracts. It uses data from other subsystems in its processing.

The **Data Imaging subsystem, also known as the Claims Control and Entry process**, consists of two main areas. The initial paper claims entry point is where paper claims are scanned and processed. The second area supported by Data Imaging allows clerks to manually key claims where the optical character recognition (OCR) functionality either did not pick up the data or picked up incorrect data and to manually correct data from the scanning process when needed. Data captured from paper claims is used in electronic claims adjudication. Paper claim images are also sent to the Feith Document Database where a user can retrieve a paper claim image using search criteria.

The **Drug Rebate subsystem** invoices drug manufacturers for expected rebates. The system posts collected amounts and generates reports on owed and collected amounts in an accurate manner. Federal regulations require drug manufacturers to enter into an agreement with CMS to provide rebates for their drug products when paid for by Medicaid. The Drug Rebate Subsystem maintains the information to carry out the federal mandates related to drug rebate processing.

The **Drug Utilization Review (DUR)** subsystem maintains the data necessary to set Prospective Drug Utilization Review (ProDUR) alerts against drug claims, notifying the pharmacist of potentially inappropriate prescriptions. It also provides information to the Medicaid Agency to complete the annual CMS ProDUR report. Criteria supplied by both First DataBank and the State is used in the real-time editing of the point-of-sale drug claims.

The **Data Warehouse subsystem (also known as the Decision Support System or DSS)** combines specialized tools and processes enabling enterprise data to be accessible for ad hoc queries and reporting purposes. The query tools allow users to aggregate data in support of Medicaid policy decision-making. Capitation, encounter, fee-for-service claims, and other AMMIS data elements are available for business users to combine and format into customized reports. The underlying data model is optimized for data access ensuring data is returned quickly and accurately.

The **Early and Periodic Screening, Diagnosis and Treatment (EPSDT)** processing function supports the Alabama Medicaid's Well Child Check-Up program. This

subsystem tracks and reports medical and dental check-ups for eligible children under 21 years of age. It is the State's mechanism to identify and track EPSDT services and to generate EPSDT downloadable reports for providers informing them of upcoming recommended screenings for their eligible recipients.

The **Electronic Data Interchange (EDI)** application provides support for collecting, tracking, and reporting on transaction files as they are processed through the application. EDI is an interface into the AMMIS for external entities to submit transactions using standard communication protocols and data structures. The contents of the transaction are validated before being directed through to various components via established application protocols.

The **Eligibility Verification System (EVS)** allows providers to check a recipient's eligibility dates to determine if services would be covered if rendered to the recipient. The eligibility response gives the provider benefit information associated with the recipient, such as Medicare plan participation, other insurance (Third Party Liability (TPL)), Primary Medical Provider (PMP), Maternity Care, lock in physician/pharmacy, lock out services, latest screening dates, Long Term Care waiver information and counts of benefit services already provided. This process supports real time transaction processing as well as batch EDI X12 transactions.

ePrescribe gives providers the ability to electronically transmit prescriptions directly to a pharmacy. Surescripts is the Alabama Title 19 (ALXIX) vendor for ePrescribing services. Surescripts connects providers through their choice of e-prescribing software to payers, chain, and independent pharmacies. Alabama Medicaid provides eligibility and medical history data to Surescripts for use by prescribers through data file uploads and real-time interactive responses to requests.

Feith is a suite of products which aids both operations and decision-makers in record management, report generation and storage, and workflow management. The Feith Document Database (FDD, also called computer output to laser disk or COLD) can store other documents, files, and images such as claims facsimiles submitted via electronic data interchange, the web, and any COLD-submitted AMMIS report.

The **Financial** function includes claim payment processing, accounts receivable, payables, and all associated financial transaction programs. The financial system verifies all funds are appropriately disbursed for claim payments and all post-payment transactions are accounted for and applied accurately. Among the subsystem's processes are generation of payments to providers and the production of a remittance advice for each provider who has claims adjudicated and/or financial transactions processed. Most payments take the form of an electronic funds transfer.

The **Long Term Care (LTC)** function supports processing of medical approvals submitted through the LTC software. These medical approvals come from registered providers administering recipients eligible for institutional long term care or Medicaid Home and Community-Based services (HCBS) waiver services. Long Term Care services include home health services, hospice care, private duty nursing, targeted case

management and waiver services as well as care in nursing and other institutional long term care facilities.

Managed Care provides the State with the ability to develop and implement various managed care systems enabling recipient access to necessary medical care while controlling medical assistance program costs. Through a combination of program plans, recipients are assigned primary medical providers responsible for managing their healthcare needs. The subsystem supports capitation, global, and fee-for service payment options. Recipients may also receive pharmacy and certain other wrap-around services outside of the managed care plan.

The Management and Administrative Reporting (MAR) function provides programmatic, financial, and statistical reports to assist the Medicaid Agency with fiscal planning, control, monitoring, program and policy development, and evaluation of the State Medical Assistance Programs. MAR uses data from all the claims processing functions as well as from financial, recipient, reference, and provider areas in creating the financial, statistical, and summary reports and data required by Federal regulations. With the RFB for the EDS, this functionality will move to EDS.

Transformed Medicaid Statistical Information System (T-MSIS) requires states to submit extract files containing information on Inpatient Claims, Outpatient Claims, LTC Claims, Pharmacy Claims, Provider, Eligibility, Managed Care Plans and TPL Resources. Files consist of over 2,000 data elements and are sent monthly. The purpose of T-MSIS is to collect, manage, analyze and disseminate information on eligibles, beneficiaries, providers, managed care organizations, and utilization and payment for services covered by State Medicaid programs. These T-MSIS data extracts are used by CMS to assist in federal reporting for the Medicaid and Children's Health Insurance Program (CHIP). The extracts are also used to produce Medicaid program characteristics and utilization information for states.

The Medicaid Eligibility Linking Interface (MELI) is a proprietary system that is positioned between the Alabama Medicaid Application and Enrollment System (AMAES) and Centralized Alabama Recipient Eligibility System (CARES) and the AMMIS. MELI receives updates from both AMAES and CARES and merges data for any pairs of identification numbers (ID) between AMAES and CARES who – at the time of merging – have the same Social Security Number (SSN), Date of Birth, First Name and Last Name (4-point match). Once merged, MELI determines the owner ID. When an ID is determined to be the owner, this means that the ID will be the current ID for the recipient. This also drives the AMMIS extract process because the data for the owning ID will be used for much of the extract.

As updates are received for either ID in a MELI merge, MELI re-evaluates the pair and may change the owner ID for the recipient; however, once merged, the IDs will not be unmerged permanently unless requested by the Agency even if the IDs no longer have a 4-point match.

Once merged by MELI, a link transaction is passed to the AMMIS so that Recipient, Claims, Prior Authorization, Third Party Liability, Managed Care and other data sources may be combined for the recipient so that the AMMIS now has a fuller picture of the recipient's Medicaid information for AMMIS processing.

The Prior Authorization function offers a way to review, assess, and pre-approve or deny selected non-emergency medical services prior to payment. It serves as a cost-containment and utilization review mechanism, enabling payment for only those treatments and services seen as medically necessary, appropriate, and cost-effective. State policy dictates certain medical services must be approved before the services are rendered.

The Provider subsystem offers a data maintenance function containing comprehensive current and historical information about eligible providers participating in the State's Medicaid program. This data repository with provider demographic, certification, rate, and summary financial information supports accurate and timely claims processing, management and utilization review reporting, and surveillance activities. It meets National Provider Identifier (NPI) standards where one unique number for a provider identifies all of its locations, provider types, specialties, licensing for services, and other required data for that provider as a logical record.

The Provider Electronic Solutions (PES) product gives providers a way to verify recipient eligibility, check claim status, perform electronic prior authorization requests, and submit electronic claims in addition to claim reversals and adjustments on behalf of Medicaid recipients. The software allows connectivity using an Internet Service Provider or a dial-up modem.

A Provider Enrollment portal provides potential Alabama Medicaid providers a secure means to submit an Alabama Medicaid Agency enrollment application via the web, provides a method for existing providers to submit Electronic Funds Transfer (EFT) and Electronic Remittance Advice (ERA) applications and allows users to view provider messages posted to the home page. The Provider Enrollment Portal function allows for the creation, save, resume and submission of electronic applications, as well as the ability to communicate to the provider the status of the application as it is processed.

The Provider Web Portal is a web site offering information to the general public as well as specific information for authenticated users. Public notices, links to manuals and software, and an option recipients can use to find local providers who are accepting new members of the recipient's plan are available to all on the home page. Trading partners, providers and clerks log in using the Secure Site menu option. Once authenticated, they gain access to pages appropriate for their profile.

The primary purpose of the **Recipient** function is to accept and maintain an accurate, current, and historical source of eligibility and demographic information on individuals as provided by the State's eligibility systems. Recipient data is used to support claims processing in both batch and real time mode so the Claims function can determine if a specific recipient has coverage for a service based on Alabama Medicaid policy. The data is also used for evaluating Managed Care assignments and LTC applications in addition

to reporting functions and eligibility verification. Extracts of recipient data are provided to entities authorized by the Medicaid Agency when requested.

There are two Eligibility and Enrollment (E&E) systems that provide eligibility data to the AMMIS Recipient system. One is known as the AMAES which is maintained by the Alabama Medicaid Agency. The AMAES has consisted of Virtual Sequential Access Method (VSAM) files since 1984. The AMAES Recipient Subsystem supports Beneficiary Services and eligibility functions; Third Party Liability and Buy-In, Non-Emergency Transportation; and Program Integrity as well as supports interfaces with other state and federal organizations including the Department of Human Resources, Department of Public Health, State Data Exchange, Internal Revenue Service (IRS), and others.

The other E&E system is CARES which provides eligibility data twice a week for Sixth Omnibus Budget Reconciliation Act (SOBRA) certified recipients. The Alabama Medicaid Agency is transferring the SOBRA recipients from AMAES to CARES. CARES will eventually become the sole E&E system. Maintenance of recipient related data is also described in other functional sections such as TPL, LTC, and Managed Care.

The **Recipient Accounts Receivable (A/R)** function helps track payments from Medicaid recipients. The payments are a result of Medicaid requesting money from the recipients as, after claims were paid, it was discovered Medicaid should not have covered the services. This subsystem maintains an Accounts Receivable file used to recover money from the Medicaid recipient.

A **Recipient web portal** allows authorized users to update personal information, request a new Medicaid ID card, check eligibility coverage, and other automated features. The head of household registers on the portal. Once registered, the head of household is able to check information for themselves or a person for whom they are the payee. Using the portal, the head of household can change the Patient First provider for themselves or recipients for whom they are responsible.

The **Reference** subsystem maintains a consolidated source of reference information the AMMIS accesses during claims and adjustment, prior authorization, and Third Party Liability processing. The Reference function maintains logical data groupings such as benefit plan, diagnosis, drug, edit and audit criteria, modifier, procedure, and revenue code data sets. The subsystem also supports AMMIS reporting functions.

The **Surveillance and Utilization Review (SUR)** subsystem aids in determining appropriate care provided to recipients and assists in the detection of potential fraud and/or abuse candidates via profiling and episode grouping using DSS. Its components include case type, peer and case group maintenance, case tracking, episode treatment grouper, and a random sample generator. With the RFB for EDS, this functionality will move to the EDS

These components are accessed through InfoView. In support of SUR, the Data Warehouse is populated with data from interchange. This allows the Data Warehouse to

provide data to the Random Sample application, Targeted Queries and the DSSProfiler process. Having everything contained within the Data Warehouse helps to ensure that all the data used to identify a suspect list comes from the same source and speeds verification.

The **Third Party Liability** subsystem tracks, reports, and pursues dollars owed to Medicaid when claims are paid for recipients who have other insurance coverage since Medicaid is the payor of last resort. The function utilizes a combination of cost avoidance (claim denial) and cost recovery (post-payment billing) to request insurance payments to cover recipient medical expenses when appropriate. TPL also supports Medicare claim recoupments (adjustments) from providers during post-payment processing. To the maximum extent possible, the AMMIS uses automated processes for cost avoidance.

3.2 User Community Description

The following roles are currently engaged in supporting the AMMIS:

- Agency Users
- AMMIS Base Team
- External Users
- Fiscal Agent Technology Users

3.3 Agency Users

The following table contains each of the functional business areas in the AMMIS and roles the Agency personnel identified as the Functional Process Owners (FPO). Each of these business areas have additional resources that are part of the work unit. The FPO represents the business area and they are the point of contact. For Alabama Medicaid, the FPO functions as the owner or gatekeeper for the business function. This information is verified by e-mail quarterly or whenever the Medicaid Management Information System (MMIS) Base team is notified of a personnel change.

Table 1: Alabama Medicaid Functional Process Owners (FPOs)

Screen ID	Subsystem	Req. Area	Function Process Owner (FPO) Role
BI	Buy-In	BUY	Medicaid Eligibility Supervisor
CM	Case Management	CSM	Medicaid Networks & Physicians Lead
EW	EDI/AVRS/PES/WEB/EVS	GEN/CLM/REC	System Support & Policy Manager
CP	Claims	CLM	System Support & Policy Manager

Screen ID	Subsystem	Req. Area	Function Process Owner (FPO) Role
RA	Recipient Accounts Receivable	RAR	Medicaid Eligibility Specialist
DR	Drug Rebate	DR	Pharmacy Services Lead
DS	DSS	DSS	Business Analytics Director
DU	Drug Utilization & Review	DUR	Clinical Pharmacist
	ePrescribing	DUR/REF	Medicaid Director of Pharmacy
EP	EPSDT/Medical Services	EPSDT	Medicaid Medical Services Lead
FN	Financial	FIN	Director of Business Analytics
ITF	Integrated Test Facility	ITF	Contract Management – IT Functional Analyst
LT	Long Term Care	LTC	Long Term Care Deputy Director
MA	MAR	MAR	Contract Management Lead
MC	Managed Care	MC	Managed Care Lead
MS	Medical Services	MS	Medicaid Medical Services Lead
ME	MELI	MELI	Family Certification Lead
PA	Prior Authorization	PA	Medicaid Pharmacy Services Lead
PR	Provider	PROV	Medicaid Enrollment Sanctions Lead
RE	Recipient	REC	Medicaid Deputy Commissioner
RF	Reference	REF	Fiscal Agent Liaison Lead
SU	SUR	SUR	Medicaid Directors Office Lead
SY	Systems	GEN	System Management Director
TP	Third Party	TPL	Medicaid Eligibility Supervisor
DG	Diagnosis Related Group	REF/CLM	Medical Services Lead

3.4 Alabama MMIS Base Team

The following table identifies the Agency personnel roles that are members of the AMMIS Base Team and their areas of responsibility. The AMMIS base team is responsible for overseeing the day-to-day operations of the Fiscal Agent.

Table 2: AMMIS Base Team

Team Member	Area of Responsibility
AL MMIS Coordinator/Privacy Officer	Director Fiscal Agent Policy and System Management
AL MMIS Coordinator/Privacy Associate	Associate Director of the Fiscal Agent System Management (MMIS)
AL MMIS Technical Lead	Technical Lead for the Fiscal Agent System Management (MMIS)
AL MMIS Fiscal Agent Liaison	Associate Director Fiscal Agent Policy Management
AL MMIS Business Services Analyst	Lead Fiscal Agent Policy Management

3.5 External Users

The table below identifies the system or subsystems and the associated users.

Table 3: External Users

System	User
AVRS	Providers, Recipients
Case Management	Effective 10/1/2019: Alabama Coordinated Health Network (ACHN) Network Entities
Claims	Alabama Hospital Association (AlaHA), Kepro (formerly Health Information Designs (HID)), Health Management Systems (HMS), Myers & Stauffer (M & S), Alabama Medicaid Agency, University of South Alabama Center for Strategic Health Innovation (USACSHI) Effective 10/1/2019: ACHN Network Entities
Decision Support System (DSS)	Alabama Medicaid Agency, Cognosante, Alabama Department of Public Health (ADPH), Health Tech Solutions (HTS), EviCore (formally MedSolutions), Optumas, Qualis, University of Alabama Birmingham (UAB), University of South Alabama (USA)
Drug Rebate	Centers for Medicare and Medicaid Services (CMS), Data Niche Data

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System	User
Drug Utilization Review (DUR)	CMS, Data Niche Data
ePrescribe	Providers, SureScripts
EDI	Vendors, Clearinghouses, Trading Partners
EVS	Providers, Gainwell Technologies, Agency
Feith	Regions Bank, Alabama Medicaid Agency, Kepro (formerly HID)
Long Term Care (LTC)	Alabama Medicaid Agency, Qualis
MAR	ADPH, CMS, Blue Cross and Blue Shield of Alabama, Alabama Medicaid
MELI	Alabama Medicaid Agency
Managed Care	USACSHI, Alabama Select Network, VIVA, Alabama Department of Senior Services (ADSS), Alabama Medicaid Agency, Office of Inspector General (OIG), Publication Press, Inc, Optumas, CMS Effective 10/1: Alabama Care Network MidState >> Alabama Care Network Southeast >> Gulf Coast Total Care >> MyCare Alabama Northwest >> MyCare Central >> MyCare East >> North Alabama Community Care
Prior Authorization	EviCore (formally MedSolutions), Kepro (formerly HID)
Provider	Alabama Chiropractor License Board, Alabama Dental License Board, Alabama Physician's License Board, Alabama Nurse License Board, Alabama Occupational Therapists License Board, Alabama Optometrists License Board, Alabama Physical Therapists License Board, Alabama Podiatrists License Board, Alabama Psychiatrists License Board, Alabama Speech Therapists License Board, Gainwell Technologies, CMS, Drug Enforcement Agency (DEA), EviCore (formally MedSolutions), OIG, Kepro (formerly HID), Alabama Medicaid Agency, Cognosante, HMS, Optumas, HTS, Publication Press Effective 10/1: Alabama Care Network MidState >> Alabama Care Network Southeast >> Gulf Coast Total Care >> MyCare Alabama Northwest >> MyCare Central >> MyCare East >> North Alabama Community Care
Recipient	Gainwell Technologies, ADPH, Alabama Medicaid Agency, Kepro (formerly HID), USACSHI, HMS, CMS, EviCore (formally MedSolutions), OIG, Optumas, Gainwell Technologies Indiana Tile XIX, Anchor Computer Software, Bizware Effective 10/1: Alabama Care Network MidState >>

System	User
	Alabama Care Network Southeast >> Gulf Coast Total Care >> MyCare Alabama Northwest >> MyCare Central >> MyCare East >> North Alabama Community Care
Recipient AR	Alabama Department of Revenue
Reference	CMS, First Data Bank (FDB), Kepro (formerly HID), M & S, USACSHI, Alabama Medicaid Agency
Third Party Liability (TPL)	HMS, Blue Cross and Blue Shield of Alabama, HMS, Defense Eligibility Enrollment Reporting System (DEERS), Department of Human Resources (DHR), United American Insurance Company (UAIC), Alabama Medicaid Agency, Prime Therapeutics, Southland Benefit Solutions, USACSHI
Provider Electronic Solutions (PES)	Providers, Gainwell Technologies, Agency
Provider Enrollment Portal	Providers, Gainwell Technologies, Agency
Provider Web Portal	Providers, Vendors, Clearinghouses, Trading Partners
Recipient Portal	Recipients

3.6 Fiscal Agent Technology Users Supporting the AMMIS

The table below identifies the roles and business area of the fiscal agent staff that supports the AMMIS. This is very high-level information and there may be multiple people in one role identified below.

Table 4: Fiscal Agent Support Roles

Role	Business Area
Account Business Executive	Administrative
Quality Assurance Manager	Administrative
Privacy and Security Officer	Administrative
Operations/Claims Processing Manager	Operations/Claims Processing
Mailroom Clerks	Operations/Claims Processing
Targeted Case Management (TCM)/Prior Authorization Coordinator	Operations/Claims Processing
Drug Rebate Clerks	Operations/Claims Processing
Cash/Financial Analysts	Operations/Claims Processing
Resolution Clerks	Operations/Claims Processing
Data Entry Clerks	Operations/Claims Processing
Claims Supervisor	Operations/Claims Processing

Role	Business Area
Medical Policy Specialist	Operations/Claims Processing
Medical Policy Analysts	Operations/Claims Processing
Provider Assistance Center Supervisor	Customer Relations
Provider Assistance Center Representatives	Customer Relations
Provider Enrollment Supervisor	Customer Relations
Provider Enrollment Representatives	Customer Relations
Electronic Media Claims Helpdesk	Customer Relations
Provider Representative Supervisor	Customer Relations
Provider Representatives	Customer Relations
Recipient Call Center Supervisor	Customer Relations
Recipient Call Center Representatives	Customer Relations
AMMIS Systems Manager	Systems and LAN Operations
System Analysts	Systems and LAN Operations
Business Analysts	Systems and LAN Operations
Technical Functional Area Leads (TFALS)	Systems and LAN Operations
Local Area Network Operations Manager	Systems and LAN Operations
System Administrators	Systems and LAN Operations
Database Administrators	Systems and LAN Operations
Desktop User Support	Systems and LAN Operations
Project Management Office	Systems and LAN Operations
Project Analyst	Systems and LAN Operations

3.7 Technical Architecture

The AMMIS network is composed of hardware residing at the Gainwell Technologies account site in Montgomery, AL. AMMIS application servers are hosted in the Orlando Data Center (ODC). The ODC operations facility is a separate location where operators and systems administrators provide administration and control of the servers. While there are two separate physical facilities, these operate as one. AMMIS user interface features rely on graphic display capabilities and native Windows-based components such as pull-down menus. These features launch action-based capabilities programmed within user-defined panel capabilities. Using base objects – a standard set of features in Windows applications – system panels (screens) are maintained.

The core components include the MMIS batch processing which was developed in the C programming language executing in a UNIX environment, and a n-tier web-based user interface written primarily in C#, utilizing Microsoft ASP.NET. AMMIS data resides in an Oracle database. There are many other critical software components, involving letter

generation, ad-hoc reports, and optical character recognition, electronic storage of paper reports and forms, and EDI.

3.8 Claims Processing Subsystem

The Claims Processing Subsystem is the core of the AMMIS. It uses data from the Recipient Eligibility (CARES/AMAES), Provider, and Reference subsystems to adjudicate claims—decide whether they should be paid and at what rate and passes that information to the remaining subsystems for analysis, reporting, and follow up.

This subsystem has four components: Front End, Medical Policy History, Control Series, and Financial.

Front End Component

The three main processes of the Front End component ensure the integrity and reliability of claim data, allowing claims to be processed and paid as quickly as possible.

The Input Conversion process transforms claims in all media (submitted electronically, or on paper) to an expanded format the AMMIS can process most efficiently. It also accepts corrections to erroneous data that caused claims to be rejected in previous cycles and re-queues the corrected claims for payment processing.

The Edit process checks the claim data against requirements defined by the Alabama Medicaid Agency to ensure its validity. For example, it ensures that numeric fields contain numbers, the provider number used is valid and active, and the procedure is appropriate to the diagnosis. Claims that do not pass these hundreds of checks are denied or suspended to be reviewed.

The Preliminary Pricing process assigns tentative payment amounts to claims according to the four most basic methods: institutional, professional, drug, and crossover.

3.8.1.1 Medical Policy History Component

The Medical Policy History component of the Claims Processing Subsystem audits all claims. That is, it compares the current claim data to its file of previous claims to be sure that the beneficiary has not exceeded the limits placed on Medicaid assistance, the claim is not a duplicate, and the relationships among the data elements are appropriate.

If the claim passes these audits, it is checked against the Prior Authorization File. Some procedures can be paid for only if Medicaid approves the procedure in advance. The Medical Policy History component first checks whether the procedure requires prior authorization and, if so, then checks whether that authorization was given.

The last step in this component is assigning a final amount to be paid to the provider for the service.

3.8.1.2 Control Series Component

The Control Series component of the Claims Processing Subsystem produces weekly reports of claim activity to be used by the fiscal agent Technology managers and Medicaid administrators.

3.8.1.3 Financial Component

The Financial component writes checks to providers (or transmits their payments electronically) and issues remittance advices (written records that help providers keep track of their payments) by transmitting a file of financial activity to the bank each week. It also compiles payment information for tax reporting; generates tax statements for providers (1099 forms and B-notices); recoups overpayments, credits, and refunds; and produces financial reports for the Medicaid administration.

3.9 AMMIS System Architecture

The AMMIS is engineered on a layered logical architecture. Access channels encompass the means by which stakeholders connect to the AMMIS. The presentation layer provides visual or audio interaction between the stakeholder and the AMMIS. The integration services layer utilizes a Service-Oriented Architecture (SOA) that provides business services access to the stakeholders and the presentation layer. The application data layer provides the business services that carry out the functionality of the AMMIS. The data layer provides independent storage and retrieval of business data.

The following graphic illustrates the multi-tiered nature of the AMMIS, providing it the flexibility to interact with multiple external entities to load, validate, and manage the data needed by system users.

Stakeholder Community identifies the stakeholders and the access channels they might use to communicate with the AMMIS, such as web browser or web service.

Presentation Layer shows the user facing system components. This consists of the AMMI User Interface (UI) used by the business teams. The AVRS system guides callers to the proper customer assistance or allows for automated inquiries for things such as member eligibility. The Provider Portals allows providers to enroll, securely submit claims, and verify eligibility.

The **Integration Service Layer** contains the Enterprise Service Bus (ESB) and workflow. This layer is used by front end components or called directly by other systems, as in the case of real-time Council for Affordable Quality Healthcare

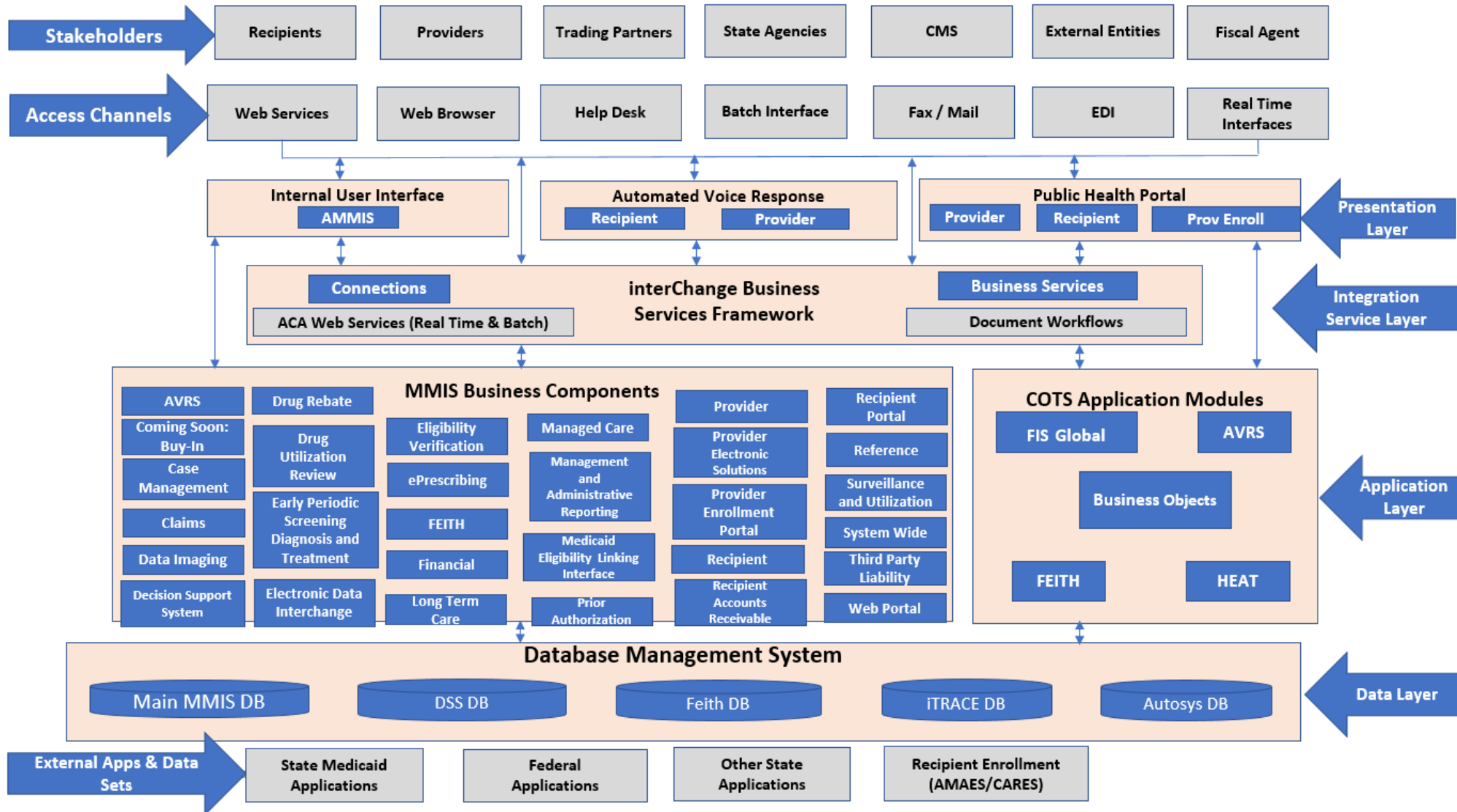
(CAQH) Committee on Operating Rules for Information Exchange (CORE) (Affordable Care Act (ACA) 1104) compliant web services.

The **Application Layer** consists of various application components broken out into business functional areas such as Member, Provider, Reference, Financial and others.

Underpinning all of this is the **Data Layer**. This consists of various data stores that align to the functional areas, such as Member, Provider or Financial. There are also a number of data stores for products, such as the workflow or content management products.

The AMMIS interacts with state, federal, and Cloud Software as a Service (SaaS) **External Applications**; one example is Lexis Nexis.

Figure 1: Technical Architecture



4 GOALS, OBJECTIVES, AND RATIONALE FOR NEW OR SIGNIFICANTLY MODIFIED SYSTEM

The Alabama MES Modularity Program (AMMP) will move the Agency away from a monolithic system and instead, implement a modular system with the information, infrastructure, tools, and services necessary to efficiently administer Alabama’s Medicaid programs. To achieve these goals, the Agency will use a combination of technology-based procurements, related services, and business process outsourcing. Our vision for the future is an improved MMIS that will enable us to improve member health outcomes. The new system must have the capability to support informed and timely decision-making, both at the policy administration level and at point of care, while promoting service coordination, transparency, and accountability.

4.1 Program Purpose

The Alabama MES Modularity Program (AMMP) will allow the Agency to transition away from a monolithic MMIS with interlocked functions into a modern, modular MMIS that is based on a Service Oriented Architecture. The current AMMIS is a tightly woven system that is primarily run by one vendor with mainly batch or direct data entry interfaces. AMMP will move the Agency toward a modular system involving multiple vendors with loosely coupled functions that will accept and respond to transactions both internally (within the AMMIS) and externally (from entities outside the AMMIS).

4.2 System Goals and Objectives

The Alabama Medicaid Agency worked with the CMS to develop a forward-looking strategy to complete the transition to a modular MMIS within six (6) years from the execution of the 2020 Takeover contract.

The MMIS Takeover contract was the first step in the AMMP. During this same time, the Agency also developed a Request for Proposal (RFP) for Program Management Office (PMO) services that includes:

- Requirements and Business Process Management
- Program Management Office
- Enterprise Architecture
- Organizational Change Management

The PMO Services RFP will provide the expertise and staff required to support a program of this size. Within the PMO RFP, it states that the vendor shall have “twelve (12) months from contract signing to submit the System Integration Contractor Request for Request for Information (RFI)/RFP/RFB to the Agency for publication”. The SI Contractor will be the last support contract required before the Agency finalizes the plan for modularization. With the help from the PMO Services vendor and the SI Contractor, the Agency will identify the

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subsystems to be decoupled from the legacy AMMIS. The decoupled subsystems will be moved to a new vendor that interfaces with the legacy AMMIS. With the final step of the AMMP the Agency will replace the legacy AMMIS with a new modular MMIS.

This new MMIS will be the Medicaid Enterprise Systems (MES). The Agency is developing MES in accordance with CMS' Medicaid Information Technology Architecture (MITA) modularity standards. MES will be realized through multiple vendors who provide services, and in some cases technology, via interoperable modules that collectively address business functions of the Alabama Medicaid enterprise. All work is being correlated to the MITA framework, building upon the State Self-Assessment (SS-A) that was submitted in February of 2019.

The major objectives of this proposed system include the following.

- Increased flexibility in system logic that can be accomplished through the following considerations:
 - Flexibility in payment mechanisms within the MMIS
 - Flexibility in program, plan, eligibility, and coverage rules
 - Flexible management and oversight of waiver and demonstration programs
 - Isolation of business logic from applications, including the use of business rules engines as appropriate
- Expanded use of automation in business and system task activities through improved integration and automation across business operations
- Increased management and monitoring of performance in systems and programs through the following considerations:
 - Establishing performance management strategies
 - Identifying performance expectations for processes, systems, and vendors
 - Automating collection of performance measurement data
- Procurement of comprehensive provider management services including:
 - Improved eligibility, enrollment, credentialing, and monitoring
 - Support automated background checks for all providers

Additionally, the new MES architecture will utilize an Enterprise Data Services (EDS) contractor. The following are the major goals and objectives for that proposed vendor:

Implement an EDS solution that will meet the Agency's business needs, while providing a technical architecture that is scalable, extensible, and secure.

Enhance and modernize AMA's data capabilities

Ensure the confidentiality, integrity, and availability of data that supports the business needs of the Agency

Provide accurate, timely, consistent, and high-quality data and information needed for operational and decision-making activities

Utilize enterprise-level data models that accurately represent the Agency's data, based on industry best practices and Agency-approved standards, rules, and policies

Ensure the security of the EDS that prevents unauthorized use and access of data and information

Implement tools and services that enhance and support the mission of the agency

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Implement environments and structure to enable the fulfillment of all data management requirements

Provide a robust process to incorporate data from multiple data sources to provide a single source of truth for required AMA visualization, reporting and analytics, and other data informational purposes.

Incorporate data from AMA systems of record, other State agencies, and external data sources to provide a central repository for required AMA visualization, reporting and analytics

Ensure the quality and integrity of AMA data through intentional and guided processes

Establish a strong data layer that will enable AMA to trust, comprehend and utilize the data to make informed decisions

Ensure use of standards and repeatable processes for reporting and analytics

- Provide a data solution that performs at appropriate service levels to meet the needs of the Alabama Medicaid Business community
 - Define SLAs that are important to the business areas
 - Identify KPIs that define the responsiveness of the EDS
 - Identify the information needed by the business area on the user dashboard
 - Define the dashboard information required by contract monitoring
 - Identify the help desk support required by the business area
 - Define any on site business area support needed (to replace current support)
 - Provide continuity of operations and disaster recovery plans for the EDS
 - Identify improvements and optimizations for the EDS
- Integrate data from multiple source that meets industry standards, as well as current and future modernization of MES
 - Ability to load historical data from current AMA systems and other systems as required
 - Develop integration and interoperability with the AMA System Integration Contractor for all internal data sources
 - Transition of the Decision Support System, Surveillance and Utilization Review Subsystem, and Management Administrative Reporting Subsystem from the Fiscal Agent's MMIS. These systems will be decommissioned upon Agency approval of the EDS operations
 - Transition of the Patient First Database (PFD) which includes, multiple MMIS tables, external data from the Alabama Department of Mental Health (ADPH) for Vital Statistics and Immunization Registry, and census data for inpatient facilities from Department of Mental Health (DMH). The PFD will be decommissioned upon Agency approval of the EDS operations
 - Transition of the Medicaid Data Lake (MDL) which includes external data from CMS Chronic Condition Warehouse, Alabama One Health Record which houses Medicaid Recipients Clinical Data, Lab Results from Health Tech Solutions (HTS), and Dual Eligible Special Needs (D-SNP) care plans from D-SNP Population Data. The MDL will be decommissioned upon Agency approval of the EDS operations
 - Ability to add data sources and systems as the AMMP continues to bring on additional modules, the first of these modules will be the replacement of AMMIS (Fiscal Agent, Claims, Third Party Liability (TPL), Reference, etc.) with the

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Claims Processing Management Systems (CPMS), which will require an additional Design, Configure, Build (DCB) with a data conversion

- Provide accurate reporting of Medicaid data to the Federal and State agencies as well as perform advanced analytical and discovery queries on Medicaid related data for supporting business decision needs.
- Implement a user-centric reporting and query tool that allows users to:
 - Utilize multiple data sources to create reports and analytics functions
 - Utilize data analytic tools to gather further insight into the data
 - Create dynamic dashboard to visualize data and scorecards/metrics
 - Provide Management and Administrative Reporting for Transformed Medicaid Statistical Information System(T-MSIS), CMS 64 and other Federal and State reporting needs
 - Update and maintain all federally defined reports
 - Provide support services with knowledgeable and experienced Subject Matter Experts (SME) in analytics and reporting throughout the life of the contract
- Provide continuous compliance with federal and state statutory and regulatory requirements to identify, and prevent fraud, abuse and/or misuse in the Medicaid program.
 - Identify instances of improper payments made to Medicaid providers
 - Decrease the error rate in payments made to providers
 - Reduce the error rate in eligibility determination to beneficiaries
 - Continue data sharing and fraud reporting efforts with federal agencies

4.3 Proposed System

The MMIS Base team met with multiple Medicaid business areas over two months during the first part of 2018. In these meetings, the pros and cons of moving to a modular subsystem were discussed. Many areas were interested in the benefits they would receive from this transition. In addition to the five (5) modules listed below, the Alabama Medicaid Agency procured PMO services and plans to procure SI Services. The PMO and SI services will work with the Agency to finalize the subsystems to be decoupled from the AMMIS. These are the initial areas that the Agency feels would benefit the most from this transition. This list is subject to change:

- Enterprise Data Services (EDS)
- Provider Management (PM)
- Modular Electronic Visit Verification (MEVV) - Implemented
- Centralized Alabama Recipient Eligibility System (CARES) - Implemented
- Claims Processing and Management Services (CPMS)

4.4 System Scope

MES will follow the MITA framework and the CMS Outcome Based Certification (OBC) process. The Scope of AMMP will be finalized with the input of the PMO Services Vendor and the SI Vendor. Section 4.3 Proposed System provides the scope of the current AMMP.

In alignment with the objectives identified for the proposed system in Section 4.2, the following are the modules that the Agency is currently considering for procurement through the modernization effort:

- SI – Services essential to support the successful implementation and maintenance of a modular MMIS solution by enabling integration across multiple modules
- Provider Management – A centralized module to unify the eligibility, credentialing, and information management of all Providers participating in Alabama Medicaid
- Enterprise Data Services (EDS) – The EDS will provide data aggregation for reporting, and data analytics. When completed, it is designed to be a ‘single source of truth’ for reporting and analytics. The following functions will be performed with data contained in the EDS:
 - Management and Administrative Reporting (MAR)
 - Program Integrity (PI)
 - T-MSIS
 - Data Analytics
- Claims Processing and Management Services (CPMS) – The CPMS will perform several functions including:
 - Processing specific types of claims and encounters such as waivers, atypical, crossovers, reversals, and adjustments according to program policies
 - Interfacing with trading partners that allows them to submit transactions using standardized communication protocols and data structures
 - Enrolling members in the Medicaid Buy-In program
 - Performing Drug Rebate
 - Screening, diagnosis, and treatment of physical, mental, and developmental health needs to children under age 21 so that health problems can be identified and treated early
 - Processing of claims payments, reimbursements, refunds, interest, enrollment fees, incentives, bankruptcy and general cost settlements, and other non-claim related payments
 - The processes of cash receipting, cost sharing, premium collections, and other receivables
 - Managing Prior Authorizations
 - Exchanging member data with CARES
 - Storing and tracking of all the codes and conditions that apply to claims/encounters
 - Shared Supporting Services:
 - Change Management
 - Incident Management
 - Dashboards

- Identity and Access Management (IdAM)
-

4.5 Business Processes Supported

The proposed systems will provide the same business processes defined in Section 3.1 Functional Description. The Alabama Medicaid Agency will streamline processes when possible and move away from a paper environment. The Agency currently uses some workflows in fiscal agent driven functions, but this will be expanded to support the move to a paperless environment. Many things may change such as the technical platform, the vendor, the interfaces, and even the look and feel of the user interface, but the basic business functions will remain the same.

4.6 High Level Functional Requirements

The Agency's current requirements are over fifteen (15) years old. The PMO Services Contractor is tasked with defining all new requirements for MES. These requirement definition sessions started in 2020 and will define the scope of the AMMP. The PMO Services Contractor will also be responsible for defining the associated business process models. With the transition to a modular MMIS, the requirements will no longer be a single owner and associated with a single contractor. For example, a module removed from the MMIS may have requirements for the new contractor, requirements for the MMIS contractor, requirements for the system integrator and interface requirements that allow all three (3) contractors to communicate successfully. There will be business rules applied with the new vendor that may affect the other vendors. The requirements will be clearly identified and documented, otherwise, the next procurement could easily misrepresent a required vendor function. The maintenance of this information will be critical to managing the new MMIS and associated modules. The business processes will be required to define predecessors, successors, and maintain multiple associations to one requirement or process. This is much like the reusable services defined in Service Oriented Architecture. A claims business process may have many of the same steps for Managed Care that it has for TPL, but they will have different predecessors, successors, and business owners.

AMMP is currently underway; the high-level requirements included in this section are for the Systems Integration module.

SI – High Level Requirements

1. Implement a centralized technical solution for integrating and enabling data flow and communication among components provided by various module contractors, through implementation of an ESB using SOA concepts.
2. Implement a solution to enable the capture of meta-data to report metrics in support of Key Performance Indicator (KPI) and issue tracking across modules.
3. Provide a plan for disaster recovery and business continuity that addresses business interruptions, including a plan to test the proposed solution on a periodic basis providing details of activities, coordination, management, and the results.

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4. Provide a data dictionary crosswalk for every field, detailing inputs and outputs between module transactions and the operational data store, current as of the last release and stored in a location accessible to the Agency. Additionally, provide user documentation using clear and consistent language with definitions provided for all acronyms.
5. Provide support following implementation of scheduled systems changes in support of maintenance and operations for the solution ensuring knowledgeable support personnel are available.
6. Comply with state and federal privacy and security requirements as defined in the detailed requirements including areas of Identity and Access Management (IdAM) and Single Sign-On (SSO).
7. Comply with state and federal privacy requirements ensuring the protection in the areas of Protected Health Information (PHI), Personally Identifiable Information (PII), and Supplemental Security Income (SSI).
8. Provide details of the project management methodology including artifacts, that shall be used to implement the solution following Project Management industry best practices while coordinating with other module contractors.
9. Actively support and participate in CMS certification activities by providing all Design, Development, and Implementation (DDI) documentation and test results, producing artifacts, such as certification evidence packets, and ensuring that the Offeror's solution meets Federal reporting requirements, MITA criteria, performance standards defined by CMS and the CMS certification checklists.
10. Implement user interfaces compliant with state and federal standards supporting accessibility requirements and maintain a dashboard, including Key Performance Indicator (KPI) and transactional log data.
11. The Offeror shall contain an Operational Data Store (ODS) to temporarily collect and manage transactional data as well as perform transactional reporting. The contractor shall ensure transactional data is transferred from ODS to an Enterprise Data Warehouse. Provide flexible reporting capabilities using analytical tools or industry standard tools on comprehensive sets of Medicaid data.
12. Ensure the new solution is able to integrate with statewide Master Data Management (MDM) solution to promote data integrity and accuracy of data.
13. Enable seamless interfaces between SI technological platform and those used by shared services to facilitate communication between modules and shared services.
14. Offeror shall implement a decoupling of business logic and system coding. The solution shall use rules-based, table driven, modular, and reusable components.
15. Provide the ability to support flexibility for upgrades or replacement components in the future and be capable of exposing system components for use by other State agencies or other entities.
16. Offerors must describe how the proposed solution meets MITA requirements and indicate where in its Proposal they are met.

4.7 Summary of Changes

The modernization effort will involve the incremental implementation of highly configurable Commercial Off the Shelf (COTS) solutions to replace the current MMIS. Collectively, these components are expected to provide cohesive functionality to achieve a specific set of business or technical purposes, providing the potential to replace individual modules as part of iterative modernization with minimal impact to other modules.

Below is a summary of potential changes to the current MMIS system that are the prime focus of the modernization effort:

- Maintenance of project activity alignment with CMS guidance for modernization
- Procurement of best-in-class COTS solutions to replace the current MMIS components
- Enactment of business process modernization activities identified in the MITA SS-A
- Implementation of improved information management across agency through identification of applicable data standards, master data management plans and relevant data models
- Efforts to achieve operational efficiencies in Medicaid operations handled across the agency

5 SCENARIOS ANALYSIS

Section 11 – Appendix A contains a description of the general functionality of the system including operational flows.

6 FACTORS INFLUENCING TECHNICAL DESIGN

The factors influencing the technical design include:

- CMS standards and guidance for modernized MMIS
- Mechanized Claims Processing and Information Retrieval Systems (90/10) Final Rule (CMS 2392-F)
- Americans with Disabilities Act (ADA) Section 508
- MITA 3.0 framework and guidelines
- Security, privacy, and operational standards provided by Health Insurance Portability and Accountability Act (HIPAA), Health Information Technology for Economic and Clinical Health (HITECH), National Institute of Standards and Technology (NIST), and Federal Information Processing Standards (FIPS), Minimum Acceptable Risk Safeguards for Exchanges (MARS-E), and Internal Revenue Service Publication 1075 (IRS 1075)
- Providing seamless integration of systems to provide efficient and effective service delivery

6.1 Relevant Standards

The relevant standards influencing design begin with the CMS guidance for modernizing MMIS and extend to MITA 3.0 standards and Medicaid Enterprise Certification Toolkit checklists for ensuring certification of the modular solutions. Additional standards relevant include HIPAA HITECH, NIST, FIPS, Wide Web Consortium (W3C), and ADA Section 508.

CMS guidance for receipt of enhanced Federal Financial Participation (FFP) indicates a preference for awarding implementation contracts for separate business and technical modules spread among multiple vendors. To meet the criteria when implementing new solutions to meet MMIS functionality, states will be required to modularize business and technical functionality to encapsulate distinct business and technical services and allow for less risky incremental implementations. CMS provides the following summary from MITA:

The Modularity condition requires the use of a modular, flexible approach to systems development, including the use of open interfaces and exposed application programming interface (API); the separation of business rules from core programming; and the availability of business rules in both human and machine-readable formats. The commitment to formal system development methodology and open, reusable system architecture is extremely important to ensure that states can more easily change and maintain systems, as well as integrate and interoperate with a clinical and administrative ecosystem designed to deliver person-centric services and benefits.

Modularity is breaking down systems requirements into component parts. Extremely complex systems can be developed as part of a service-oriented architecture. Modularity

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also helps address the challenges of customization. Baseline web services and capabilities can be developed for and used by anyone, with exceptions for specific business processes handled by a separate module that interoperates with the baseline modules. With modularity, changes can be made independently to the baseline capabilities without affecting how the extension works. By doing so, the design ensures that future iterations of software can be deployed without breaking custom functionality.

A critical element of compliance with this condition is providing CMS with an understanding of where services and code will be tightly coupled, and where the state will pursue a more aggressive decoupling strategy.

For the Agency to meet CMS guidelines for its envisioned MMIS, implementation of a Service Oriented Architecture will be key. SOA is essential to integrating multiple vendor modules that provide business and technical functionality. SOA is defined as a loosely coupled application architecture (AA) within which business and technical functions, designed to meet the business needs of an enterprise organization, can be invoked using open, standard, and exposed interfaces. Documenting standards for these exposed interfaces allows components of the SOA framework to detect and utilize the functionality of other components in the architecture regardless of either's internal technologies.

Central to the Agency implementing SOA will be its desired procurement of an SI contractor that will be required to deploy an ESB. An ESB is a software architecture model used for designing and implementing communication between disparate and mutually interacting software applications in an SOA. The SI module will be responsible for requesting and disseminating data between each business and technical module in a standard and consistent manner, whether using real-time transactions (e.g., web services) or passing batch files (e.g., Secure File Transfer Protocol (SFTP) services) for processing.

In addition to SI responsibilities for technical integration of enterprise modules, the SI will also be responsible for the implementation of an ODS. The exact functionality and purpose for the ODS is yet to be defined.

Potentially, the ODS will:

- Transform and store transactional data to standard data formats, naming designations, and functional definitions from across the enterprise
- Be a short-term enterprise reporting repository where data from all modules across the enterprise has been accumulated and standardized
- Periodically export data to the EDS for long term reporting
- Represent the System-of-Record (SOR) for some types of reference data, for example, county codes, diagnosis codes, procedure codes, and program codes

Modular architecture is implemented by encapsulating business or technical services. Each module would serve as the System of Record for the business or technical services it provides. A business services module would be responsible for the capture and dissemination of its business domain information for the entire enterprise. Modules providing technical

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functionality would be responsible for ensuring standard integration outcomes for its services across the entire enterprise.

The Modular Medicaid Enterprise Systems will adhere to the CMS Seven Standards and Conditions as established in the following documentation:

[CMS Seven Standards and Conditions](#)

The Modular Medicaid Enterprise Systems will comply with all applicable standards and regulations as set forth in the HIPAA of 1996 and all enacted changes as established and recorded here:

[HIPAA for Professionals](#)

The Modular Medicaid Enterprise Systems will adhere to National Institute of Standards and Technology 800-53 as appropriate for medium impact security controls as established and recorded here:

[NIST Risk Management Framework](#)

The Modular Medicaid Enterprise Systems will adhere to Internal Revenue Service Publication 1075 (IRS 1075) guidance for US government agencies and their agents that access federal tax information (FTI) to ensure that they use policies, practices, and controls to protect its confidentiality

[IRS 1075](#)

The Modular Medicaid Enterprise Systems will adhere to the Minimum Acceptable Risk Security and Privacy Controls for Exchanges (MARS-E) requirements

[MARS-E](#)

6.2 Assumptions and Dependencies

AMMP will comply with CMS guidance for Medicaid Enterprise Certification Life Cycle (MECL) certification including enhanced FFP.

Design assumptions for the modular Medicaid Enterprise Systems:

- No custom-developed modules
- COTS or Software as a Service (SaaS) are required
- All modules will be hosted off-premises via cloud service provider
- An operational integration and data transformation platform will be provided by the System Integrator
- All modules will communicate with each other via this integration platform
- A module should be able to fully perform its function regardless of state of other participating modules or the SI platform availability
- Resulting system shall be fully certified by CMS
- Replacing any given module should require no additional development in other modules

Dependencies for the project include:

- Availability of vendors for module work because of vendor commitments in other states seeking new Medicaid systems would result in delays or issues for system integration
- Availability of suitable COTS products to satisfy MES requirements could frustrate CMS guidance for modularity or cause the State to need to seek alternative solutions
- Availability of key Agency staff could cause a lack of expertise for defining module requirements

6.3 Constraints

Medicaid Enterprises encounter many factors that interrupt the free-flowing transformation of business, information, and technologies. The limiting factors may be of short or long durations, with more persistent factors requiring active strategies to mitigate the negative effects.

Key factors that limit the desired transformation of the MES include the following:

- Competing priorities across transformative initiatives, where the initiatives:
 - Require staff that may be fully engaged in operational tasks or other initiatives
 - Depend on other initiatives that have yet to be completed
 - Require access to limited funding
- Resource limitations, including:
 - Funding for enhancements or additional staff resources
 - Available staff to plan or effect transformational projects, due to finite head count and current operational or initiative workloads
- Limited marketplace for Medicaid systems and services, reducing the number of Contractors capable of providing critical systems and services to the MES, and leading to increased costs based on limited competition
- A dynamic and unpredictable set of expectations, causing the MES to support new requirements with little notice, potentially interrupting other initiatives, driven by state and federal mandates, shifts in stakeholder expectations, and changes in attainable technological capabilities
- The following are other high-level constraints:
 - State Legislation
 - Time and schedule
 - Project complexity

Modules that make up the Medicaid Enterprise Systems would be hosted off-premises from an Alabama Medicaid standpoint. The prevailing method to meet this requirement will be cloud-hosted products.

All identified modules must integrate with and communicate through the integration platform provided by the System Integration Contractor (SI).

Additional constraints will be established in future updates.

6.4 Design Goals

The design goals for the modernized MMIS include:

- Use of COTS product(s) with leveraging configurable solutions and minimizing customizations
- System and Interface design to achieve real-time and seamless integration with Social Security Administration (SSA), State and Federal agencies and portals
- System design that is consistent with HIPAA (5010), NIST, HITECH, FIPS, and other CMS guidance and regulations
- System design that accommodates the accessibility guidelines by ADA section 508 and W3C
- Application of MITA standards as part of MMIS modernization project
- Active and ongoing participation of the stakeholders and Subject Matter Experts (SMEs) throughout the design and development phases
- Implementation of a centralized technical solution for integrating and enabling data flow and communication between components provided by various module vendors, through implementation of an ESB using SOA concepts
- Solution incorporating rules-based, table driven, modular, and reusable components

7 PROPOSED SYSTEM

The proposed system is intended to primarily address the modernization goals of the Agency. As part of the modernization effort, the Agency is planning to procure modular MMIS components consistent with CMS guidance, the Agency’s modernization roadmap, as well as the goals and objectives of AMMP. The overall effort of modernization will involve replacement of the existing MMIS components with new modular components. The Agency is also planning to procure services of an SI contractor and other module vendors to aid in the planning, design, implementation, operation, and oversight of the overall MES.

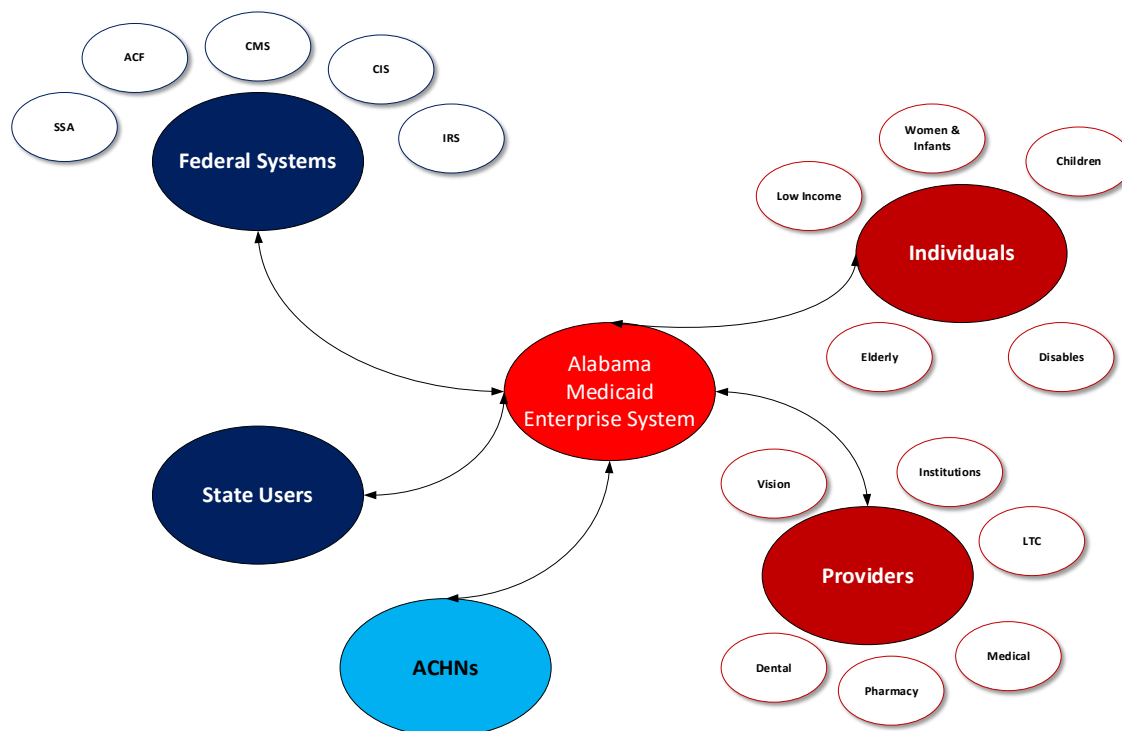
The Agency’s approach for modernization involves the distribution of responsibilities to various contractors including:

- PMO – Contractor to perform activities to support the management of AMMP
- System Integration Contractor – Contractor to assist in the detailed planning, incremental implementation, and maintenance of MES

MMIS Modules – Contractors associated with the configuration, implementation, and Maintenance and Operations of individual MES Modules

Figure 2: MES Context Diagram is a System Context Diagram (SCD) depicting external entities that interact with the MES.

Figure 2: MES Context Diagram



7.1 Context Diagram

Figure 3: Context Diagram



The modular Medicaid system will include an integration platform provided by the System Integration Contractor facilitating data communication between modules. At this time, five modules have been identified:

- Enterprise Data Services – For reporting and analytics
- Provider Management – For provider enrollment and management activities
- Modular Electronic Visit Verification – For visit validation
- Centralized Alabama Recipient Eligibility System (CARES) – For recipient enrollment and eligibility
- Claims Processing and Management Services (CPMS) – For claims operations and all functionality not covered by the other modules

7.2 High-Level Operational Requirements and Characteristics

The high-level operational requirements and characteristics of the modernized MES include the following:

- Creation of a unified approach to business operations and supporting systems across the Alabama Medicaid Enterprise, providing consistency in operations and in the management of information
- Building a central platform that can support operations for Medicaid

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- Promotion of statewide data sharing through integration of independent system components such as MEVV with claims adjudication and PI analytics with other components to provide flexible fraud-detection capabilities
 - Consistent use of applicable data standards in all components within the MES
 - Increased interagency collaboration to promote potential sharing of IT assets and resources to support shared business functions across agencies
 - Centralized management of financial operations to ensure consistency and comprehensive financial data for analytics and reporting purposes
 - Flexible reporting enabled through specialized analytical tools using comprehensive sets of Medicaid data
 - Increased management and monitoring of systems and programs' performance and the establishment of performance management strategies, and the identification of performance expectations for processes, systems, and contractors
 - Implementation of shared technical components across MES, providing consistency in operations and more comprehensive access to program information, including:
 - Incident Management
 - Change Management
 - Dashboards
 - Identity & Access Management (IdAM)
 - Assigning operational responsibility for select business functions to experienced contractors
 - Improved self-service capabilities supporting the Agency suite of Medicaid programs, delivered with a consistent user experience using web, mobile application, and other appropriate technologies
 - Compliance with current and future MITA or other external architectural requirements
 - Continued expansion of eligibility processing and other related functionality
 - Procurement of comprehensive Provider Management services to support improved eligibility, enrollment, credentialing, and monitoring capabilities
 - Consolidating information across the Medicaid Enterprise for enterprise reporting and analytical purposes
 - Compliance with CMS guidance for Federal certification
 - Interoperability across modules through standardized, published interfaces, and data compatibility
-

7.3 User Community Description

As depicted in the MES Context Diagram, the following are the various types of user communities that interact with MES on a regular basis.

Table 5: User Community

User Group	Description / Expected Use of System	Total Users	Concurrent Users
Federal Systems	Users from Federal agencies such as CMS and the Internal Revenue Service (IRS) These users perform audits and enforce reporting requirements at the program level		
State Users	Users from the Agency These users support the business operations and other technical functions needed to manage and support various programs within Alabama Medicaid		
ACHNs	Users from the ACHNs These users access and utilize self-service options to perform business functions		
Individuals	This group includes both individuals seeking Alabama Medicaid program benefits and those currently receiving benefits and services from the program These users access information about potential benefits and services made available through the Alabama Medicaid program, including self-service Portal and Enrollment Broker services		
Providers	Users from the Provider community These users access and utilize self-service options to perform business functions		

7.4 Non-Functional Requirements

Non-functional requirements for the modernized MMIS solution include considerations for the following categories:

- Business Continuity/Disaster Recovery – Activities to ensure the recovery and continuity of business operations in the event of disaster
- Compliance – Activities to support audit requirements and ensure compliance with applicable state and federal regulations
- Integration – Activities to enable and maintain the integration of various components of MES to support data access and communication across modules

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- Maintenance & Operations – Support activities to ensure ongoing maintenance & operations of the solution
 - Privacy – Includes requirements that ensure the protection of Medicaid entity data, such as PHI, PII, and SSI, primarily through compliance with state and federal guidelines
 - Project Management – Activities to support the planning, scheduling, and overall management of MES
 - Reporting – Activities to support the collection and propagation of data necessary to generate data extracts and reports for various program needs
 - Security – Includes requirements that need to be satisfied to achieve the security attributes of an IT system
 - Systems and Application – Includes requirements to support and maintain system performance
 - Testing – Activities to ensure proper functioning and overall readiness of a system
 - Training – Activities to ensure the planning and execution of various training tasks tailored to each user group
 - User Documentation – Activities toward development and maintenance of operational and other reference documentation to support program needs
 - User Interface – Requirements to ensure accessibility and consistency in user interface content
-

7.4.1 Security and Privacy Considerations

Security requirements for the proposed system include the following:

- Considerations to ensure compliance with State and federal guidelines around information security
- Management and oversight of access to systems, networks, system software, systems files, and State data by user authorization levels
- Implementation of security controls to employ intrusion and attack prevention and detection capabilities
- Support for monitoring, reporting, investigating, and assessing security incidents in accordance with State and federal policies
- Support for audit capabilities to comply with State Security and Privacy policies and standards

Privacy Requirements for the proposed system include the following:

- Implementation of security measures to protect the confidentiality of PHI/PII/SSI received from the Agency
- Establishment and maintenance of physical, technical, and administrative safeguards to ensure the following:
 - Security and confidentiality of PHI/PII/SSI
 - Protection against anticipated threats or hazards to the security or integrity of PII/SSI
 - Protection against the unauthorized access or use of PII/SSI

- Considerations to ensure compliance with data handling privacy requirements associated with HIPAA and other state and federal Privacy guidelines
-

7.4.2 Availability Requirements

Availability requirements for the proposed system include the following:

- Support activities for operations, administration, maintenance, and technical support required to manage MES and to ensure uninterrupted system availability
 - Post-implementation support for service changes or system upgrades, including support for issue management and resolution
 - Development of a plan for disaster recovery and business continuity that addresses business interruptions, including a plan for testing the proposed solution on a periodic basis
-

7.4.3 Volume and Performance Expectations

Volume and Performance requirements for the proposed system include the following:

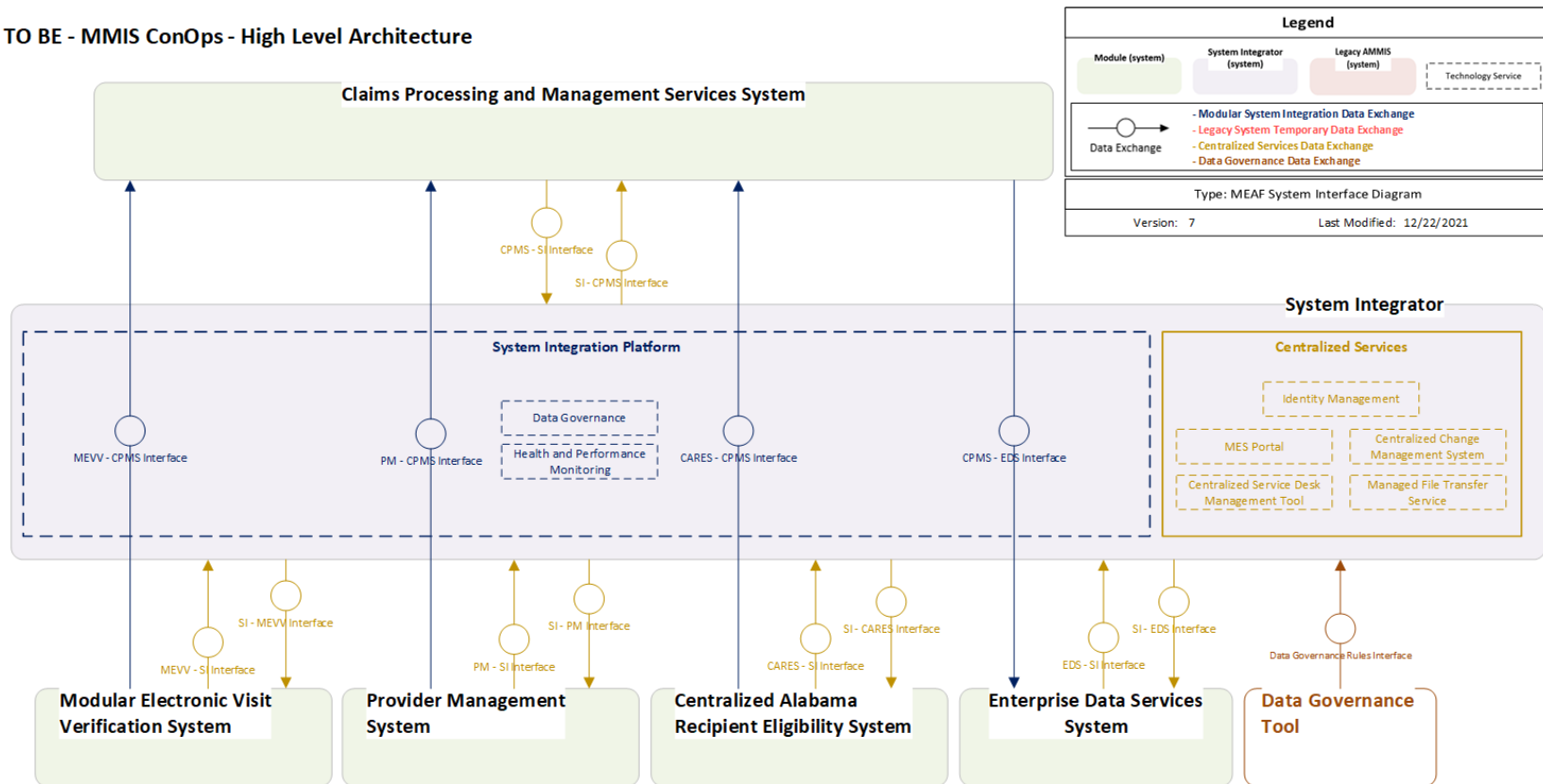
- Tracking, monitoring, and reporting on system performance
- Activities to support processing of transaction files, error reconciliation and reprocessing in accordance with state processing standards
- Implementation of rules-based, table driven, modular and reusable components
- Development and maintenance of technical documentation to facilitate knowledge transfer of system's internal workings
- Reporting capabilities to track system performance metrics and support operational and analytical needs of the Agency

7.5 High Level Architecture & Alternatives Analysis

The high-level architectural design for the modernized MMIS will closely follow CMS MITA guidance for a service oriented, modular, incremental implementation. Figure 4 depicts the future MES High Level Architecture.

Figure 4: High Level Architecture

TO BE - MMIS ConOps - High Level Architecture



Disclaimer: Data Exchanges in this diagram are examples of interfaces between modules and not intended to illustrate technical solutions

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Prior to selecting an architectural path toward modularity, in addition to CMS direction and MITA guidelines, a set of guiding principles were established for Alabama Medicaid to aid in decision-making throughout the process. Alternatives were evaluated in light of these principles as well as technical feasibility.

Figure 5: Guiding Principles

Guiding Principles

Keep it Simple	Higher complexity carries higher risk and higher cost
Attainable and Sustainable	The resulting system can be reasonably procured, implemented and maintained by Alabama
Marketplace Lessons Learned	Use market successes and failures as a guide
Industry Supportability	There are enough viable vendors in each space
Right Fit for Alabama	The right size and scale while meeting stated business goals, objectives, and outcomes

Several alternative architectures were considered while evaluating the modular strategy for Alabama.

Alternative 1: CPMS as System Integration Contractor

Capitalizing on the role that the core CPMS plays in the enterprise system and leveraging the existent Enterprise Service Bus made sense at a technical level.

Table 6: Pros and Cons – Alternative 1

PROS	CONS
One Less Procurement	Difficulty in transition to new CPMS vendor
Simpler Architecture	Limited modularity
No intermediate transition of data	Unequal partnership
Leverages existing service bus	

The primary factors that influenced selection against this alternative include:

- Heavy reliance on the CPMS vendor
- Alabama’s desire for an independent technical partner
- Lack of modularity options for the future

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Alternative 2: Non-technical System Integration Contractor

In this alternative, the System Integration Contractor would provide direction and oversight to the integration of multiple modules, but not bring an intermediary product to the enterprise.

Table 7: Pros and Cons – Alternative 2

PROS	CONS
Leverage existing service bus (CPMS) Simpler Architecture	Limited modularity High reliance on Core/CPMS vendor

The primary factors that influenced selection against this alternative include:

- Uncertain compliance with CMS requirements
- No track record of success in the market with this approach

Alternative 3: More Granular Modularization

Multiple permutations of which business services could and should be grouped together as modules for procurement were considered (e.g., Pharmacy Services, Translation Services, Customer Support Services, Financial Services).

Table 8: Pros and Cons – Alternative 3

PROS	CONS
More competitive procurement possibilities	Multiple procurements More complex data handling

The primary factors that influenced selection against this alternative include:

- Burden on staff to engage in multiple simultaneous procurements
- Future modules can be defined and implemented as beneficial to the Agency

Alternative 4: “Traffic Cop” version of System Integration Platform.

In light of passing data through multiple cloud boundaries, a version of the SI platform was considered that provided interface management and authorization, but did not provide the interface itself, saving on costs of data transportation and storage.

Table 9: Pros and Cons – Alternative 4

PROS	CONS
Data passes between fewer handlers	Less flexible for future
SI Platform has minimal footprint	

The primary factors that influenced selection against this alternative include:

- Data Management
- Future flexibility

The settled upon strategy fully meets CMS requirements, minimizes risk, and provides flexibility for the future to further modularize and expand capacity as required.

7.6 Application Architecture

The application components, depicted as Systems in Figure 4 above, are described in Table 10 below. The Agency’s strategy for implementing each component reflects its efforts to modularize the overall system through the purchase of new stand-alone components.

Table 10: Application Architecture

Application Component	Description (Business Process Supported, Purpose of Component)	Strategy (Build, Buy, Reuse, Rewrite)
Provider Management System	The Provider Management system is a targeted TO BE System that will provide a modular solution to support the provider management, information management, provider communications, and provider web portal.	Buy
Claims Processing and Management Services System	The Claims Processing and Management Services System (CPMS) is a targeted TO BE System that will replace multiple functions currently provided by the Alabama Medicaid Management Information System (AMMIS). CPMS will support Medicaid business functions and processing for areas such as claims, financial management, care management, managed care enrollment, benefit package maintenance, third party liability, recipient management, pharmacy, and prior authorization.	Buy/Take Over

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Application Component	Description (Business Process Supported, Purpose of Component)	Strategy (Build, Buy, Reuse, Rewrite)
Modular Electronic Visit Verification System	The Modular Electronic Visit Verification System (MEVV) is currently in-process of being implemented. Under this model, the Agency will set the processing standards for MEVV, provide a front-end application for capturing Electronic Visit Verification (EVV) visit data, and aggregate EVV visit related data from third-party systems. Providers under this model have the flexibility to use the Agency's MEVV or select a solution that better meets their individual business and technology needs. Should providers select a solution of their own, they will be required to submit standardized visit-related data as defined by the Agency, to the MEVV.	Buy
Centralized Alabama Recipient Eligibility System	Centralized Alabama Recipient Eligibility System (CARES) is currently in a production state and is targeted to also take over functions currently provided by the Alabama Medicaid Application and Enrollment System (AMAES). CARES provides functionality to support the Recipient Eligibility and Enrollment Business Services of the Agency.	Build
Enterprise Data Services System	Enterprise Data Services (EDS) is a targeted TO BE System. The EDS will integrate, transform, and connect data across the organization and serve as the central repository for the Alabama Medicaid Agency (AMA) to interact with their data. This will allow for the AMA to make informed and timely decisions, as well as provide business intelligence (BI) tools for reporting and advances analytics that will provide operational support and management of the state's healthcare program. MAR, SUR, DSS and T-MSIS reporting will be conducted out of the EDS.	Buy

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Application Component	Description (Business Process Supported, Purpose of Component)	Strategy (Build, Buy, Reuse, Rewrite)
System Integration	<p>The System Integration Contractor is a targeted TO BE system that includes a System Integration Platform, Integration of MES Contractor Systems, and Centralized Services.</p> <p>The System Integration Contractor will provide the following Technology Services:</p> <p>System Integration Platform – Transforms and exchanges data among MES Contractor Systems and integrates the various MES modules into a seamless, functional system.</p> <p>Data Governance – The process of managing the availability, usability, integrity, and security of the data per guidance supplied by the Alabama Medicaid Data Governance Office (DGO).</p> <p>Health and Performance Monitoring – The process of monitoring system health and stability and presenting system health metrics for management of the MES.</p> <p>Identity Management – A solution that creates, modifies, disables, and deletes user accounts and their profiles across the MES.</p> <p>MES Portal – A login and registration functionality and initial landing page for the MES.</p> <p>Centralized Service Desk Management Tool – A single view into all service requests across the MES.</p> <p>Centralized Change Management System – Used to coordinate and manage changes of the components in the MES.</p> <p>Managed File Transfer Service – A solution that will reliably and securely exchange electronic data with systems outside the MES.</p>	Buy

7.7 Information Architecture

As the current systems are replaced with modular systems, the data necessary to support the Agency's operations will be divided between the appropriate systems. Documenting the data entities in the Information Architecture ensures that each required type of data is accounted for during the implementation of new systems. The table below provides a listing of high-level data entities and the primary system responsible for the origination and storage of each data entity (System of Record).

The high-level conceptual information model required to support MES is depicted in the following diagram.

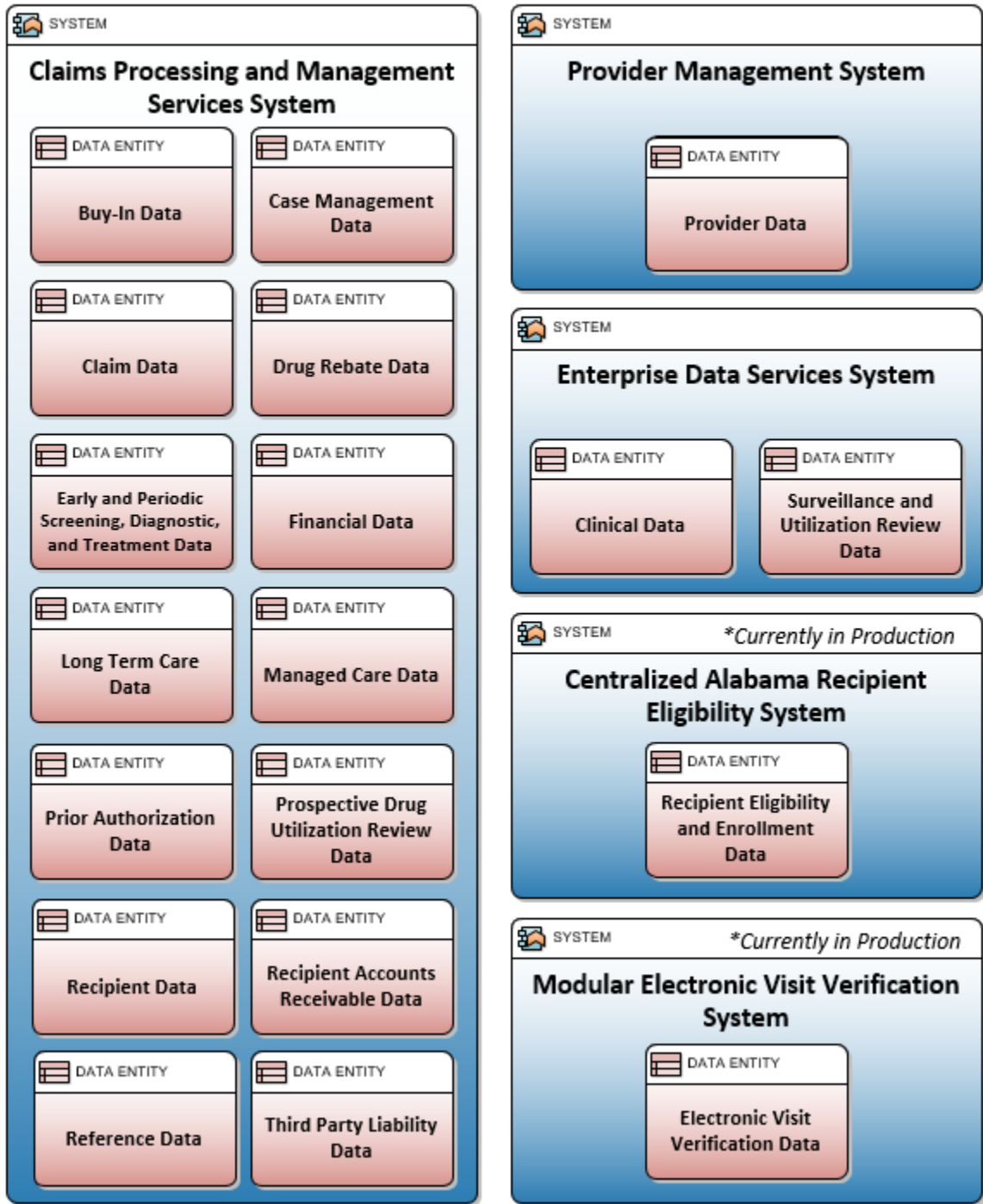
Table 11: Information Architecture: Conceptual High-Level Data Entities

Data Entity	System(s) of Record
Benefit Plan Information	Claims Processing and Management Services System
Buy-In Data	Claims Processing and Management Services System
Case Management Data	Claims Processing and Management Services System
Claim Data	Claims Processing and Management Services System
Claim Payment	Claims Processing and Management Services System
Clinical Data	Enterprise Data Services System
Drug Rebate Data	Claims Processing and Management Services System
Early and Periodic Screening, Diagnostic, and Treatment Data	Claims Processing and Management Services System
Electronic Visit Verification Data	Modular Electronic Visit Verification System
Financial Data	Claims Processing and Management Services System
Long Term Care Data	Claims Processing and Management Services System
Managed Care Data	Claims Processing and Management Services System
Pharmacy Claims Data	Claims Processing and Management Services System
Prior Authorization Data	Claims Processing and Management Services System
Prospective Drug Utilization Review Data	Claims Processing and Management Services System
Provider Data	Provider Management System
Recipient Accounts Receivable Data	Claims Processing and Management Services System
Recipient Data	Claims Processing and Management Services System
Recipient Eligibility and Enrollment Data	Centralized Alabama Recipient Eligibility System
Reference Data	Claims Processing and Management Services System
Surveillance and Utilization Review Data	Enterprise Data Services System
Third Party Liability Data	Claims Processing and Management Services System

Figure 6: Conceptual Information Model

TO BE - MMIS ConOps - System of Record for High Level Data Entity

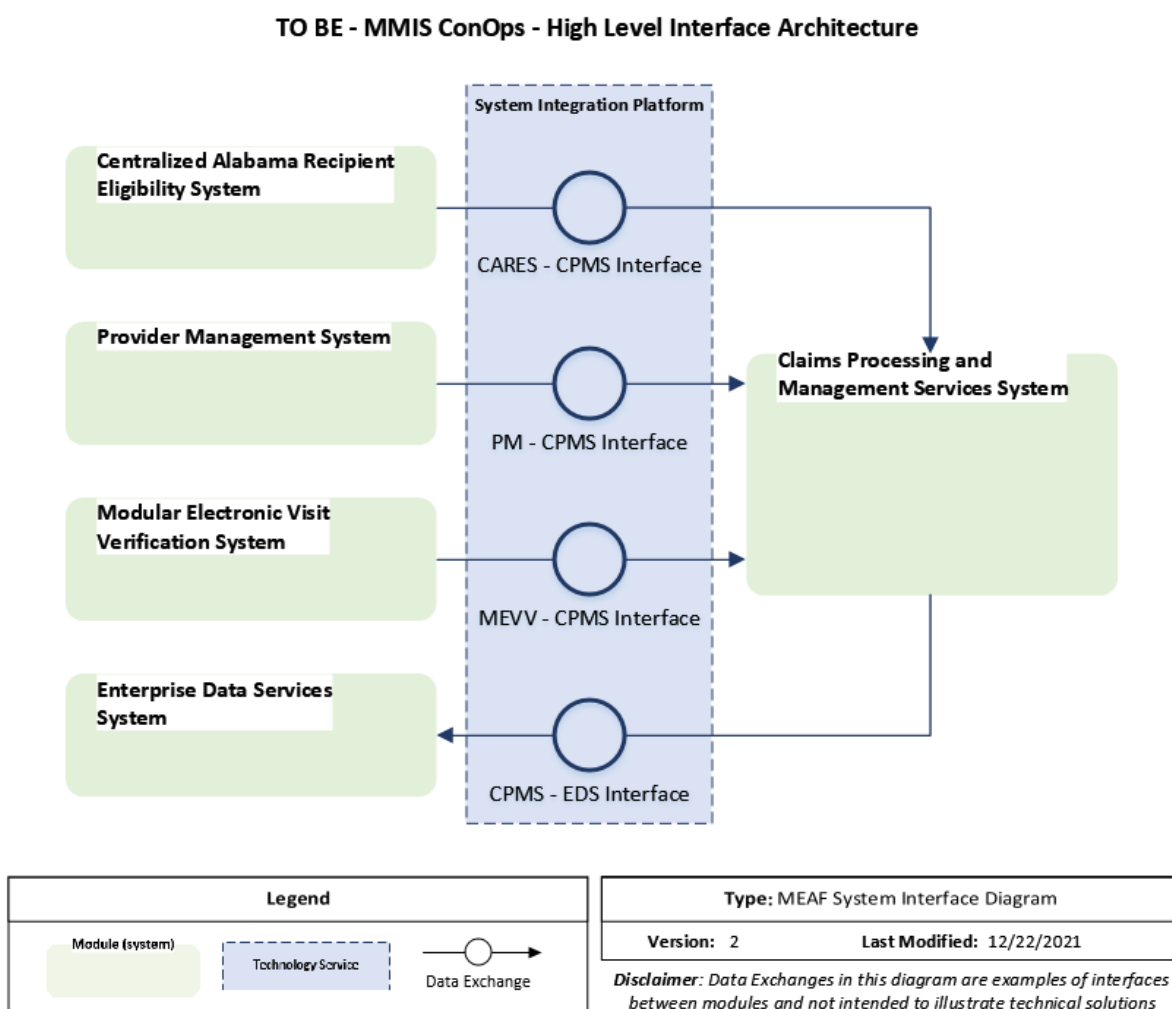
Type: MEAF Data Dissemination Diagram	
Version: 3	Last Modified: 6/15/2022



7.8 Interface Architecture

All internal interfaces, batch and real-time, will flow through the SI module. The SI module will track transaction, file, and performance data as it is passed between the modules. Numerous internal interfaces are anticipated between the system of record modules, and those needing their data to fulfill the delivery of their business functionality. The SI Contractor will be responsible for a roster of internal interfaces required between modules that will make-up the MES. The diagram below and subsequent table contain examples of internal high-level interfaces. The comprehensive list of interfaces will be developed as the SI solution is implemented.

Figure 7: High-Level Interface Architecture



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Table 12: Interface Architecture: High-Level Interfaces

Source System	Destination System	Purpose	Expected Batch/Real-Time	Related Data Entities
Centralized Alabama Recipient Eligibility System	Claims Processing and Management Services System	Provides Recipient Eligibility and Enrollment Data	Batch	Recipient Eligibility and Enrollment Data
Provider Management System	Claims Processing and Management Services System	Provides Provider Data for Enrollment and Updates to Information	Real-Time	Provider Data
Modular Electronic Visit Verification System	Claims Processing and Management Services System	Provides Electronic Visit Verification Data	Real-Time	Electronic Visit Verification Data
Claims Processing and Management Services System	Enterprise Data Services System	Provides all data from Claims Processing and Management to Enterprise Data Services to support data analytics and reporting	Batch	Buy-In Data Case Management Data Claim Data Drug Rebate Data Early and Periodic Screening, Diagnostic, and Treatment Data Electronic Visit Verification Data Financial Data Long Term Care Data Managed Care Data Prior Authorization Data Prospective Drug Utilization Review Data Provider Data Recipient Data Recipient Accounts Receivable Data Recipient Eligibility and Enrollment Data Reference Data Third Party Liability Data

7.9 Technology Architecture

This section will describe the high-level technical architecture of the envisioned MMIS at the current level of refinement.

As a review, CMS guidance for receipt of enhanced FFP indicates a preference to awarding implementation contracts for separate business and technical modules spread among multiple vendors. To meet the criteria when implementing new solutions to meet MMIS functionality, states will be required to modularize business and technical functionality to encapsulate distinct business and technical services and allow for less risky incremental implementations. CMS provides the following summary.

The Modularity condition requires the use of a modular, flexible approach to systems development, including the use of open interfaces and exposed application programming interface (API); the separation of business rules from core programming; and the availability of business rules in both human and machine-readable formats. The commitment to formal system development methodology and open, reusable system architecture is extremely important to ensure that states can more easily change and maintain systems, as well as integrate and interoperate with a clinical and administrative ecosystem designed to deliver person-centric services and benefits.

Modularity is breaking down systems requirements into component parts. Modularity also helps address the challenges of customization. Baseline web services and capabilities can be developed for and used by anyone, with exceptions for specific business processes handled by a separate module that interoperates with the baseline modules. With modularity, changes can be made independently to the baseline capabilities without affecting how the extension works. By doing so, the design ensures that future iterations of software can be deployed without breaking custom functionality.

A critical element of compliance with this condition is providing CMS with an understanding of where services and code will be tightly coupled, and where the state will pursue a more aggressive decoupling strategy.

For the Agency to meet CMS guidelines for its envisioned MMIS, implementation of a Service Oriented Architecture will be key. A SOA is essential to integrating multiple contractor modules that provide business and technical functionality. An SOA is defined as a loosely coupled application architecture within which business and technical functions, designed to meet the business needs of an enterprise organization, can be invoked using open, standard, and exposed interfaces. Documenting standards for these exposed interfaces allows components of the SOA framework to detect and utilize the functionality of other components in the architecture regardless of either's internal technologies.

Central to the Agency's implementing an SOA architecture will be its desired procurement of an SI Contractor who will be required to deploy an ESB. An ESB is a software architecture model

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used for designing and implementing communication between disparate and mutually interacting software applications in a SOA. The SI will be responsible for requesting and disseminating data between each business and technical module in a standard and consistent manner, whether using real-time transactions (e.g., web services) or passing batch files (e.g., Secure File Transfer Protocol (SFTP) services) for processing.

In addition to SI responsibilities for technical integration of enterprise modules, the SI Contractor will also be responsible for the implementation of an ODS. The exact functionality and purpose for the ODS is yet to be defined.

Potentially, the ODS will:

- Transform and store transactional data to standard data formats, naming designations, and functional definitions from across the enterprise
- Represent a short-term enterprise reporting repository where data from all modules across the enterprise has been accumulated and standardized
- Will periodically export data to the Enterprise Data Services for long term reporting
- Represent the SOR for some types of reference data, for example, county codes, diagnosis codes, procedure codes, and program codes

Modular architecture is implemented by encapsulating business or technical services. Each module would serve as the SOR for the business or technical services it provides. A business services module would be responsible for the capture and dissemination of its business domain information for the entire enterprise. Modules providing technical functionality would be responsible for ensuring standard integration outcomes for its services across the entire enterprise.

The modernized MMIS is envisioned as a collection of highly configurable components and modules, interconnected using a platform deployed, maintained, and operated by the SI Contractor. Modules and components are expected to provide cohesive functionality to achieve a specific set of business or technical purposes, providing the potential to replace individual modules as part of iterative modernization with minimal impact to other modules of the MES.

7.9.1 Platform

Prior to procurement, specific platforms are unknown. The hardware and operating systems for the new MMIS will vary depending on each procured contractor's choice in the development of their solution. While there will likely be several variations across the procured modules, platform independent applications using open standards and exposed, discoverable services will foster a successful integration.

7.9.2 System Hosting

Where the hardware physically resides will vary from contractor-owned facility to using a cloud-based, shared environment. Regardless, each environment should be highly available, scalable, and secure.

7.9.3 Connectivity Requirements

Network connectivity between modules will likely happen on the internet through extranet communications. An extranet is a private network that uses internet technology and the public telecommunications system to securely share part of a business's information or operations with suppliers, vendors, partners, customers, or other businesses.

One method to accomplish extranet communications is through the use of Web services. A Web service application provides the means for communicating and data exchange from machine to machine or application to application. It is basically a collection of open protocols used to exchange data between applications. The use of open protocols enables Web services to be platform independent. Software written in different programming languages and running on different platforms can use Web services to exchange data over computer networks. Because different applications are written in different programming languages, they often cannot communicate with each other. A Web service enables communication by using a combination of open protocols and standards, primarily Extensible Markup Language (XML), Simple Object Access Protocol (SOAP) and Web Services Description Language (WSDL). A web service uses XML to tag data, SOAP to transfer a message and finally WSDL to describe the availability of services.

XML is a protocol used to store and transfer data. XML was designed to emphasize simplicity, generality, internet usability, and to be both human and machine readable. SOAP is a protocol for sending and receiving messages between applications without confronting interoperability issues due to disparate platforms. SOAP content varies slightly depending on its purpose, whether it is requesting information or responding with information requested.

WSDL is a document that describes a Web service and how to access and use its services. The main things to remember about a WSDL file are that it provides:

- a description of the Web service
- the services (methods) a Web service provides and the data (parameters) it needs to identify the requested information
- a way to discover Web services

7.9.4 Modes of Operation

System Environments

For each module the contractor will be required to build and maintain the following environments to be used as part of their Software Development Life Cycle (SDLC):

- Development and Unit Test – development and unit test of application components
- System Test – integration testing between internal application components

- Integration Test – integration testing between external module applications. End to end testing of cross-module processes.
- User Acceptance Test (UAT) – used for Agency validation and verification
- Staging – an environment mirroring production where applications can be tested against production data before deploying to production.
- Production – primary production environment
- Disaster Recovery – a backup of production that should always align with the production environment
- Training – user training

7.10 Security and Privacy Architecture

Medicaid information systems are subject to numerous Federal and State security and privacy requirements and industry standards. The MES will be compliant with the security and privacy guidelines under NIST, HIPAA, HITECH and FIPS. It will also be compliant with Federal security standards for cloud computing environment and support a Disaster Recovery and Continuity of Operations Program (COOP) based on NIST standards. Summarized below are some of the details of the security and privacy considerations for this project.

Security Controls

- Organizational Level Controls
- The Information Security Office oversees the creation of a tight organizational security framework
- Security incident classification and response protocols
- Security training and awareness program to educate employees of potential threats
- Appropriate Business associates and non-disclosure agreements are required of third-party contractors that may have access to, or receive potentially confidential information
- Security review and sign-off of all systems
- Change control and project tracking to ensure new security risks are not introduced
- Rules based alerting on suspicious activities
- On-going risk analysis and mitigation
- Access level based on appropriate roles and authorization levels
- Regular backups
- Windows and third-party updates along with other maintenance activities are performed on a regular weekly schedule
- Enterprise level Antivirus/Anti-spam/Anti-malware suite

Application Level Controls

- Secured application authentication
- Role based security
- Secure HTTPS/TLS (Transport Layer Security) protocol for outward facing web applications

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- Strong password policy
- Session timeouts in 20 minutes of idle time
- Web application vulnerability scanning and remediation

Identity, Credential and Access Management

- Complex password
- System accounts require more complex passwords
- Password expiration (defined based on system)
- Password not to be stored in clear text, written, or provided in e-mail
- Authentications should only occur over secured protocols
- Save password features should be disabled when possible and never used when available
- Unique user accounts per individual – no shared accounts
- Separation of duties (Administrative functions are not available in a non-administrative role)
- Off boarding procedures to ensure accounts and access levels are removed in a timely manner
- On boarding procedures to ensure minimal access levels are granted
- Administration module allows supervisors or administrators to manage users

Secure Infrastructure and Cloud Computing

- Physical / Environmental controls established to identify and protect assets from physical threats such as earthquakes, fire, floods, and power outages
- Regular backups
- Robust Cloud Computing environment
- Server can be created with all security and related configuration settings in hours

Data Encryption

- Encryption of data in motion and at rest; using secure protocols
- Encryption of all confidential data

Audit Trails

- Comprehensive centralized logging on the network, operating system, and application level
- One (1) year live data retention for all logs
- Rule based alerting on suspicious activities
- Change control and project tracking
- Access controls integrated with in house tools
- Code change tracking and version control
- All permissions changes and administrative activity is logged and retained
- All Virtual Private Network (VPN) and remote activities are logged
- All database activity is logged and retained
- All web server activity is logged and retained
- All activity within the application is logged and retained

7.10.1 Authentication

MES will employ strict authentication mechanisms for front-end users and interfacing with external systems. The front-end users will be authenticated by the system using a user ID and password. The system will enforce strict industry standard password policies. Wherever possible the state's single sign on solution should be utilized with the modules to allow central administration of user authentication and authorization. A single sign-on mechanism will be employed to make sure the user is authenticated once and does not need to enter his or her user account information again to access multiple solutions.

7.10.2 Authorization

MES will employ role-based security, allowing access by users to specific features based on their defined role. Each user's role will be granted based on an assigned user type. The roles will be assigned to users by a System Administrator.

Each module will assign roles and go through an approval process during implementation. Where possible, AMMP-wide roles should be used. All roles will be reviewed and approved by the Agency.

7.10.3 Encryption

All critical data (e.g., password, Social Security Number) will be encrypted while at rest. All web traffic will be encrypted. Secure File Transfer Protocol (SFTP) will be used for batch file transfers. The batch files will be encrypted using industry standard encryption tools. The database will also be encrypted.

8 ANALYSIS OF THE PROPOSED SYSTEM

The following sections describe impacts, risks, issues, and critical success factors for the proposed system.

8.1 Impact Analysis

The organizational impact focuses on potential impacts to human resources brought about by various changes in the organization. Consideration of options for potential restructuring and improvements in operational services of the current business functionality. The following table shows the alignment of the business functions to the operations reviewed as part of the modernization planning impact analysis.

Table 13: Operational Alignment

Business Function	Operational Alignment
Member (Individual) Management Member eligibility and enrollment Member information management Member communications	The operational functions of Member Management are currently performed in two system, AMAES and CARES. The operational functions will only be performed in CARES in the future.
Provider Management Network outreach Provider enrollment and credentialing Provider communications Self-service activities	The operational functions of Provider Management are currently performed in AMMIS. The operational function of network outreach will be performed by CPMS staff while the other functions will be performed with-in the Provider Management module. Provider Outreach to verify locations for enrollment will be part of Provider Management.
Fee for Service (FFS) claims processing Claim receipt and edit Claim adjudication and pricing Financial responsibility resolution	The operational functions concerning the processing of FFS claims are currently performed in AMMIS. In the future, these functions will be performed in the CPMS module.

Business Function	Operational Alignment
<p>Analytics and Reporting</p> <ul style="list-style-type: none"> Federal reporting and data sharing Ad hoc queries Performance monitoring Program effectiveness Support for rate setting, and program planning Health outcome analysis Program Integrity Reporting 	<p>Operational reporting will continue to be performed by individual modules as part of their daily functions.</p> <p>Analytics and Reporting are currently performed in AMMIS will move to the EDS module. The EDS module will perform all federal, ad hoc and metric performance reporting across the AMMIS enterprise.</p>

8.2 Operational Impacts

Potential operational impacts of the new modular MMIS solution include the following:

- Operational efficiencies by adopting modern technical platforms and shared solutions
- Improved flexibility and scalability through use of cloud computing
- Increased automation to reduce the number of manual processes
- Elimination of older, isolated systems and processes to support business functions efficiently
- Initial slowdowns in processing as operational areas adjust to the operations of the new systems.
- Initial security and administrative setups will be required on new systems for external users so that new systems can be utilized.

8.3 Organizational Impacts

The MES modernization effort will have significant organizational impact. The staffing and allocation of resources will be impacted as a result of the efforts to support the requirements analysis, development, testing, implementation, and ongoing maintenance of this solution. Other organizational impacts include:

- Impact to current staff
- Burden of managing multiple simultaneous and more frequent procurements
- Management of multiple vendors
- Re-alignment of some responsibilities to better accommodate the new MES
- Training on new systems will be required for staff
- Time will be required for staff to build relationships with new vendors
- Impact to staffing needs
- Additional staff necessary for testing and test oversight
- Changes to process

- Creation of new Change Management and Incident Management processes
 - Addition of a Change Advisory Board to manage releases to production
 - Management of multiple production and non-production environments
-

8.4 Risks

Potential risks that may influence the new systems include the following:

- Lack of suitable COTS products to satisfy MES requirements could frustrate CMS guidance for modularity or cause the State to need to seek alternative solutions
 - Lack of standard model for System Integration product and services creates difficulty in estimation of cost, scope of service and even technical solutioning
 - Resolution of system issues and outages in a multi-contractor environment can prove problematic as there is no longer a singular responsible party
 - Hard deadline to replace current MMIS greatly influences the scope and complexity of the proposed solution
-

8.5 Issues to Resolve

Open issues that could potentially impact the modernization effort include the following:

- Lack of reference materials around modularization effort from other states
 - Competing priorities of business resources involved in the effort
 - Inadequate staffing to support project tasks
 - Coordination of the complex integration effort required to facilitate the timely transition of existing MMIS components
 - Multiple concurrent initiatives outside the modernization effort affecting the procurements
-

8.6 Critical Success Factors for Remainder of Program

Critical success factors for the MES modernization effort include the following:

- CMS Certification for each module MES
 - Defined and fully adopted standards and practices
 - Individual module success criteria to be defined at the project level
 - Successful planning and coordination of the transitioning of existing MMIS components with implementation effort for new modules
 - Successful and timely completion of the implementation efforts for all modules
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8.7 Critical Success Factors

Critical success factors were discussed in Section 8.6.

9 GLOSSARY

[AMMP Acronyms and Glossary](#)

10 APPENDICES

11 APPENDIX A - Scenarios Analysis

AMMP will modernize the AMMIS. Projects within AMMP will be undertaken to replace functionality currently provided by the AMMIS systems with new COTS solutions. The program will be guided in part by the Centers for Medicaid and Medicare Services' standards for system architecture and integration to build a modular system composed of best-in-breed applications and technology. This iteration of the ConOps is focused on the procurement of the System Integrator. It is not intended for the SI to perform any business processes. Business processes for future modules will be added to this section during the procurement cycles for those modules.

12 APPENDIX B - Conceptual Information Model

The Conceptual Information Model is discussed in Section 7.7.