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WV Purchasing Division

SAS Response to West Virginia RFI for Medicaid Enterprise System (MES)

State of West Virginia Bureau for Medical Services (BMS)
RFI CRFI BMS2200000001



SAS Response to West Virginia RFI for Medicaid Enterprise System (MES)

State of West Virginia
Bureau for Medical Services (BMS)
RFI CRFI BMS2200000001

January 10, 2022

Submitted by:

Steve Sachs, Sales Manager

Steve Sachs

Electronic signature here,

Scanned signature on Title Page & RFI Acknowledgment

(517) 992-1781

Steve.Sachs@sas.com

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Cary, NC 27513

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January 6, 2022

Attn: Ms. Crystal Husted
State of West Virginia
Department of Administration, Purchasing Division
2019 Washington Street E
Charleston, WV 25305

RE: Request for Information CRFI BMS2200000001, Medicaid Enterprise System (MES)

Ms. Husted:

The State of West Virginia Bureau for Medical Services (BMS) Request for Information for Medicaid Enterprise System (MES) is an opportunity to innovate and improve health outcomes for citizens of West Virginia. SAS is pleased to submit the enclosed information which demonstrates our position as a leader in innovation in this area and our enthusiasm to continue our partnership with the State of West Virginia.

In our response, the proposed framework we identify for you leverages one integrated software solution for data integration, analytics, business intelligence and reporting of fraud, waste, and abuse. What we offer as an EDW, analytics, and program integrity solution, is unmatched in the industry today. The expected outcomes of this framework will serve to reduce staff time and related expenses associated with managing overly complex IT infrastructure and applications. The SAS solution empowers users of all different backgrounds to harness a full range of advanced analytic features, spanning forecasting, predictive modeling, artificial intelligence, and machine learning. Even nontechnical users can use these tools to explore and visualize huge amounts of data to, among other things, identify geographic hotspots, anticipate future public health threats, measure the impact of policy decisions, and identify fraud, waste, and abuse.

We are excited to share our vision and will describe in detail how SAS can be leveraged by BMS to maintain and improve the health and welfare of West Virginians. Our response intends to demonstrate for you how we will draw upon not only our technological expertise in this field, but also our knowledge of the State of West Virginia, a relationship that spans over 40 years and across over 6 state agencies including the Department of Administration, the WV Department of Transportation, WV State Tax Department, WV Division of Rehabilitation Services, WV Office of Maternal Child and Family Health (part of DHHR), and the WV Board of Pharmacy. We also serve as the IT backbone for the West Virginia Fusion Center – supporting dozens law enforcement agencies across the state in bringing together criminal justice data into a single, cohesive source of intelligence.

SAS acknowledges receipt of all Addendums.

Sincerely,

Steve Sachs

Steve Sachs, Sales Manager
(517) 992-1781, Steve.Sachs@sas.com

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: BMS220000001

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

- | | |
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| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
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| <input checked="" type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
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| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

SAS Institute Inc.



Company
Debbie Faircloth

January 10, 2022 Authorized Signature

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
Revised 6/8/2012



Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

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| Proc Folder: 964162 | | Reason for Modification: | |
| Doc Description: REQUEST FOR INFORMATION-MEDICAID ENTERPRISE SYSTEM (MES) | | | |
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| Date Issued | Solicitation Closes | Solicitation No | Version |
| 2021-11-17 | 2022-01-07 13:30 | CRFI 0511 BMS2200000001 | 1 |

BID RECEIVING LOCATION

BID CLERK
 DEPARTMENT OF ADMINISTRATION
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 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Customer Code: 000000213810

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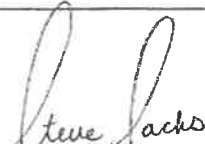
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Vendor Signature X  ***Any contract relating or resulting from this RFI shall be subject to negotiation and mutual agreement.**

FEIN# 56-1133017 **DATE 1-6-2022**

All offers subject to all terms and conditions contained in this solicitation

ADDITIONAL INFORMATION

REQUEST FOR INFORMATION:

THE WEST VIRGINIA PURCHASING DIVISION IS ISSUING THIS REQUEST FOR INFORMATION FOR THE AGENCY, WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES (DHHR), BUREAU FOR MEDICAL SERVICES (BMS), FOR THE PURPOSE OF GATHERING INFORMATION TO DEVELOP SPECIFICATIONS FOR A MEDICAID ENTERPRISE SYSTEM (MES) MODERNIZATION. INFORMATION PROVIDED WILL ASSIST THE WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES IN DEVELOPING SPECIFICATIONS AND WILL ASSIST IN THE PROCUREMENT PROCESS.

QUESTIONS REGARDING THE SOLICITATION MUST BE SUBMITTED IN WRITING TO CRYSTAL.G.HUSTEAD@WV.GOV PRIOR TO THE QUESTION PERIOD DEADLINE CONTAINED IN THE INSTRUCTIONS TO VENDORS SUBMITTING BIDS

ONLINE RESPONSES FOR THIS SOLICITATION ARE PROHIBITED

| Line | Comm Ln Desc | Qty | Unit Issue | Unit Price | Total Price |
|------|--|-----|------------|------------|-------------|
| 1 | Medicaid Enterprise System (MES) Modular | | | | |

| Comm Code | Manufacturer | Specification | Model # |
|-----------|--------------|---------------|---------|
| 93151507 | | | |

Extended Description:

Medicaid Enterprise System (MES) Modular

SCHEDULE OF EVENTS

| <u>Line</u> | <u>Event</u> | <u>Event Date</u> |
|-------------|--------------------------|-------------------|
| 1 | VENDOR QUESTION DEADLINE | 2021-12-06 |



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| Proc Folder: 964162 | | Reason for Modification: | |
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| Doc Description: REQUEST FOR INFORMATION-MEDICAID ENTERPRISE SYSTEM (MES) | | ADDENDUM 2 TO CORRECT METHODS OF RESPONDING AND EXTEND THE OPENING DATE | |
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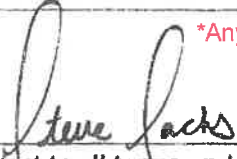
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*Any contract relating or resulting from this RFI shall be subject to negotiation and mutual agreement.

Vendor Signature X  FEIN# 56-1133017 DATE 1/10/2022

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| Comm Code | Manufacturer | Specification | Model # |
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| 93151507 | | | |

Extended Description:

Medicaid Enterprise System (MES) Modular

SCHEDULE OF EVENTS

| Line | Event | Event Date |
|------|--------------------------|------------|
| 1 | VENDOR QUESTION DEADLINE | 2021-12-06 |



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BID RECEIVING LOCATION

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City : Cary

State : North Carolina **Country :** United States **Zip :** 27513


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Vendor Signature X  **FEIN#** 56-1133017 **DATE** January 10, 2022

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Executive Summary

Modernizing Medicaid systems is no small feat and we applaud West Virginia's Bureau for Medical Services (BMS) in proactively reaching out to the vendor community for best practice recommendations. Your areas of focus are direct: to meet changing needs and priorities of the state system; apply these system changes to the various state programs and partner agencies, and execute the changes through a modular approach. These focus areas address your goals to shift towards a model focused on modularity, outcomes, efficiencies, opportunities for leverage and reuse with other states and multi-state planning, continuous improvement, data timeliness and accuracy all within a secure technical infrastructure.

It is well known that agencies, like BMS, continuously need to do more with less. The SAS Institute (SAS) recommendations presented in this request for information (RFI) response are provided as best practice recommendations from 45+ years of conducting work in state government procurements.

Our comments are developed from a number of SAS staff having worked on BMS projects for different companies over the years. We have also included ideas from delivery of services to Medicaid agencies across the country. Our goal is to provide ideas that enable the vendor community to respond to highly competitive modules which generate the best value for the best price to BMS for these services.

SAS has supported West Virginia state government as far back as 1980, when we began working with the Department of Administration. Since then, we have grown to support the WV Department of Transportation, WV State Tax Department, WV Division of Rehabilitation Services, WV Office of Maternal Child and Family Health (part of DHHR), and the WV Board of Pharmacy. We serve as the IT backbone for the West Virginia Fusion Center – supporting dozens law enforcement agencies across the state in bringing together criminal justice data into a single, cohesive source of intelligence.

Why is SAS expertise important to West Virginia?

SAS is the largest privately held software and analytics company in the world, with annual revenue of over \$3.25 billion. Yet, we are not a massive system integrator with hundreds of thousands of employees. For BMS, we offer relevant skills and experience from a vendor large enough to be dependable and reliable, but also a vendor small enough to value our

SAS Understands WV BMS MES Modernization Goals.



relationship and provide personalized service. SAS offers you the perfect balance of strong delivery and intense personal focus. You may think of SAS as specialized software for data scientists. In fact, that is what we have been for much of our 45-year history. But SAS has evolved well beyond a niche coding language. Today, our heart-and-soul is data and analytics. We specialize in ingesting data (from just about any source or format), cleansing and organizing that data, and using analytical models to turn that data into business insights. Those skills are precisely what BMS needs for Medicaid modernization.

SAS goes beyond other vendors' narrow definitions of MES modernization by including business intelligence, offering business analytics – data management, predictive analytic and forecasting capabilities – telling an organization like BMS not just where it has been, but where it should go next. SAS' EDW and business analytics modules deliver the foresight and understanding required to meet and exceed the BMS' goals outlined in this RFI.

To affirm our expertise in Design, Development, and Implementation (DDI), SAS serves all 50 state governments, all 15 federal departments and approximately eighty-five percent (85%) of federal subagencies and quasi-governmental affiliates. On average, we maintain systems and host solutions for more than 1,000 clients globally. These statistics are important to BMS because vendors need to establish their credibility in being able to deliver on time and on budget. SAS also understands the unique needs of West Virginia government.

Our modular solutions aggregate data from multiple sources, normalizes this data and creates actionable results that impact state Medicaid program operations in a single, integrated platform. The SAS solution creates client health analytics and provides in-depth, outcome-based results applied to specific goals, including program integrity. This enterprise approach allows any state user with the appropriate permissions to have immediate, real-time analytics access generated by the SAS solution.

SAS' core capabilities – data management, advanced analytics and reporting and machine learning expertise combined with decades of Medicaid experience – are precisely what's required to implement a successful modular solution. Our solution is dynamic and delivers immediate return while also providing the foundation to grow and evolve with the state for years to come. As a proof point to our delivery capabilities, SAS delivered the nation's newest CMS certified Medicaid EDW for South Carolina on time and on budget. Our state-of-the-art system was certified in February 2020 and included a program integrity module. The implemented solution fully supports and aligns to the Medicaid Information Technology Architecture (MITA) framework, as well as the Centers for Medicare and Medicaid Services (CMS) seven conditions and standards.

What we offer as a modular solution, is unmatched in the industry today. We would welcome an audience with BMS to provide specific feedback that can best be discussed after some disclosure of the various projects and BMS' needs. In advance of the Advance Planning Document (APD) submissions to CMS or discussions with the state legislature, we recommend scheduling discussions with vendors to confirm alignment of your desired scope of services with the requested budget.

Our response will:

- ◆ Address or mitigate challenges BMS faces today
- ◆ Provide thought leadership into what is available in marketplace today
- ◆ Align to the BMS overall strategy.

- ◆ Identify what is beyond the current IBM solution
- ◆ Confirm that SAS is a player in the MES space and we are serious about it

SAS Lessons Learned:

SAS is not a “Be all things to all States” type of company. Instead, our points of interest are based upon successful implementations and lessons learned from our various state modularity projects which include: EDW, program integrity, and analytics projects

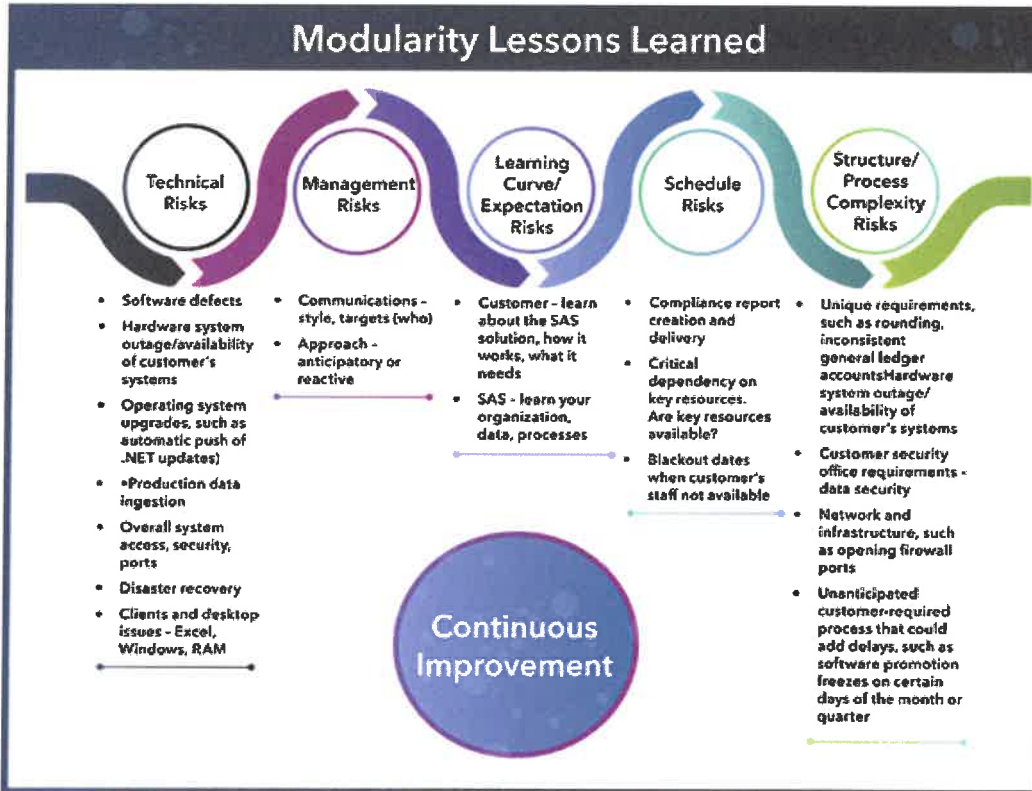


Figure 1. Our Clients benefit from SAS' ongoing improvement of products, services, and processes through incremental and breakthrough improvements.

While a conversation with the Department will provide greater detail and nuance, we have prioritized our thoughts concerning lessons learned below. Lessons learned from previous health care projects have shown us that project risks typically fall into these categories:

The System Must be Secure: HITRUST/MARS-E and NIST 800-53 Rev-4 are all useful security standards for MES modules. However, since there is no direct data exchange between BMS and CMS, having a FedRAMP authorized system limits competition to only vendors like SAS who have various FedRAMP platforms. Most state IT offices have established NIST 800-53 moderate as their standard, and CMS accepts this standard in state MES projects when certifying enhanced federal funding for development.

Preference for CMS “Pre-certified” Solutions: CMS piloted a “precertification” program from 2016-2018. However, they discontinued the program after strong pushback from the National Association of Medicaid Directors (NAMD) who collectively petitioned CMS to understand that a cookie-cutter approach to MES modularity would not work across different states. Any

vendor who has achieved CMS certification on behalf of a state, has the credibility to deliver a complex program for BMS.

Alignment of Scope and Budget: There is often a misalignment between project cost and desire of the scope of services to be fulfilled with complex services contracts. While burdensome, in addition to this RFI, we continually suggest to states to create a “draft RFP” and then ask for vendor feedback/input. Because of the FOIA laws, vendors are hesitant to provide their competitors with insight as to what their bid costs will be prior to an RFP release. In the State of Colorado while creating their MES modules in 2014/2015, the state committed to keeping RFI and Draft RFP project cost estimations from the various vendors secure until after a contract award was made. The state benefited by identifying a range of costs which they then harmonized and took to both CMS and the state legislature for approval prior to the RFP being released. The result was Colorado had budget approval from both CMS and the legislature to fund the project prior to its inception.

Do not use NASPO ValuePoint for the Procurement Process: While there is a perception that utilizing the NASPO procurement mechanism for prequalifying vendors in specific market segments saves time, since NASPO ValuePoint prequalification only happens approximately once every ten (10) years, the dynamics of the vendor community substantially change throughout this time period. Vendors who might have once been prequalified might have left the business market and newer qualified vendors are precluded from responding since they did not exist during the prequalification round. Moreover, using the NASPO process actually reduces the amount of competition for state work.

SAS understands the vision and strategic direction you have established based upon the various BMS publicly available documents we have researched. We know the technology, data, and data analytics capabilities you need to achieve that vision. We constantly improve our solutions by including new innovations which focus on areas like Value Based Payments and Managed Care Organization (MCO) oversight. We have proven we can deliver on the core infrastructure, and our team provides optimal results when a state Medicaid program is seeking significant transformation and innovation. Historically, few states have actively sought the high level of innovation that BMS desires. We look forward to an opportunity to further discuss the complexities of the WV MES modernization process before an RFP is released.

4.2 Questions

4.2.1 Vision for West Virginia Bureau for Medical Services

Please describe any elements BMS should consider incorporating into its vision, planning, and implementation for a modernized, modular MES.

BMS should consider the following elements into your vision, planning, and implementation for Medicaid modularity:

- ◆ **Communicate meaningfully with vendors** – States that are most successful with modularity are those that communicate frequently with vendors. These states view vendors as innovation partners, not as adversaries. They view vendors as a source of innovation and thought leadership. This approach aligns perfectly with the underlying purpose of modularity – generating new ideas that result in better health for lower cost. Communicating meaningfully can come in many forms. It could mean conducting periodic conference calls to provide an update on modularity plans. It could mean hosting one or more “vendor days” to allow vendors to update BMS on the latest innovations from other states. It could mean posting relevant, detailed materials on a dedicated web site for Medicaid modernization.
Vermont is a state that communicates well with vendors. Vermont issues periodic emails that communicate status of modularity planning. The state also actively seeks out interactions with vendors at industry conferences such as MESC. Connecticut maintains a [public web site](#) that disseminates information on modularity status.
- ◆ **Seek innovation** – The underlying intent of CMS in creating the modular approach is to encourage innovation and increase competition. Perhaps the best way to seek innovation is to describe your business challenges and desired outcomes to vendors, then allow vendors to present new and creative ways of solving those challenges and achieving desired outcomes. This is in stark contrast to the traditional approach that states take, in which they create a long list of standard requirements that vendors must meet. Practically, this will require BMS to take a different approach to writing RFP documents.
- ◆ **Issue draft RFP's** – SAS strongly recommends that BMS issue a draft RFP for each module that you intend to procure. The purpose of the draft RFP is to (a) seek input from vendors on how to improve the RFP, and (b) generate better proposals from vendors that are easier to evaluate and compare. States that issue draft RFP's treat them like a Request for Information (RFI). Wisconsin and Pennsylvania have used the draft RFP strategy quite successfully.
- ◆ **Set high standards for preventing conflicts of interest** – The health care industry is experiencing a dizzying array of mergers and acquisitions. Payers are creating or buying health IT capabilities. IT firms are investing in payer and provider organizations. This blurring of lines among payers, providers, and IT firms can create conflicts of interest. Unwittingly, BMS could hire a firm that has interests that do not align with the goals of the Medicaid program. For example, an MES vendor could be owned (wholly or partially) by a managed care organization that supports West Virginia's Medicaid program. That creates a conflict of interest, and it may put other managed care organizations at a competitive disadvantage. To prevent conflicts of interest, BMS should (a) require significant transparency in disclosing ownership and potential conflicts of interest, and (b) disqualify vendors that have either a real or perceived conflict with the state's Medicaid goals.

4.2.2 Optimal MES Configuration

In the projects you have been on, what was the optimal configuration of MES modules specific to functionality, integration of other solutions, and management of data?

CMS gives states wide latitude in how they define modularity—there is no standard set of modules that are either required or recommended.

It is somewhat surprising, then, that states have coalesced around a core set of MES modules. The most common modules adopted across numerous states include:

- ◆ Project Management Office (PMO)
- ◆ System Integrator (SI)
- ◆ Enterprise Data Warehouse (EDW)/Decision Support System (DSS)
- ◆ Program Integrity (PI)
- ◆ Third Party Liability (TPL)
- ◆ Pharmacy Benefit Management (PBM)

Your question focuses on the optimal configuration of MES modules. The de facto standard that has emerged seems to serve most state Medicaid agencies well. However, given CMS recent guidance on outcomes-based certification, we recommend that BMS consider several variations to this standard set of modules to advance health goals:

- ◆ **Data Analytics and Reporting (DAR) module**—There is an emerging trend in which states are defining a module that specifically focuses on data analytics and reporting. For clarity, these states differentiate between an Enterprise Data warehouse (EDW) or Decision Support Services (DSS) and the data analytics/reporting function. In such states, the EDW or DSS is purely a data repository for collecting, cleansing, and organizing key Medicaid data—including fee-for-service claims, MCO encounters, member enrollment, and provider enrollment. The separate DAR module focuses on the practical uses of that data. The DAR module may include analytical tools, reporting tools, and ongoing services from data scientists, expert modelers, and health policy experts. Generally, the DAR module focuses on more advanced types of analytics (machine learning, artificial intelligence, link analysis) and away from basic report generation. States that have created a DAR module include Wisconsin and Hawaii, and states such as Alabama and Mississippi are including a DAR module in their APD's. We recommend that BMS create a DAR module that is separate and distinct from your current EDW work.
- ◆ **Medicaid Policy module**—We are starting to see states consider a novel idea for a module—one dedicated to Medicaid policy. The genesis of this module is the demands put on all state Medicaid agencies by governors, state budget directors, state legislatures and other external stakeholders. Every session, state government leaders consider changes to the Medicaid program. They turn to the agencies like BMS to provide an impact analysis today and in the future. And, state Medicaid Directors are constantly seeking innovative ways to improve health outcomes by proposing policy changes. The challenge in all of this? State Medicaid agencies struggle to provide data-driven answers to such policy changes on a timely basis.
That's where a Medicaid Policy module comes into play. This module provides dedicated capabilities to simulate proposed changes to Medicaid policy—calculating the impact on budget, demand for services, and health improvements. It is distinct from the EDW/DSS or DAR modules because of the user community—Medicaid Directors and policy staff, who have unique needs from other types of users within BMS and need quick insights. States like South Carolina are the early adopters of this type of module. We recommend

that BMS strongly consider a stand-alone module for Medicaid Policy to strengthen your ability to provide data-driven answers to challenging policy questions.

- ◆ **Program Integrity (PI) module**—Generally, states include a program integrity module that support the Medicaid Program Integrity function within that state. A few states are expanding the scope of the Program Integrity module to include the Medicaid Fraud Control Unit (MFCU) to make it easier to share case information and to enable deconfliction of claims under investigation. Some states are also looking to expand the scope of PI to include electronic referral of certain cases to the Special Investigations Units (SIU's) of the managed care organizations that support the Medicaid program. BMS should consider expanding the scope of the PI module in this manner. We welcome a chance to discuss with BMS how states are implementing these ideas.
- ◆ **Managed Care Oversight module**—Managing MCO's is a tough job for state Medicaid agencies. Recognizing the challenge, some states are considering the creation of a module that focuses exclusively on monitoring MCO performance, members' access to care and contract compliance—as well as on rate negotiations for renewing MCO contracts. Much like the Medicaid Policy module, the Managed Care Oversight module is distinct from other modules because of the user community—compliance officers, rate negotiators, and state procurement officials. BMS should strongly consider a stand-alone MCO Oversight module to strengthen oversight and contract compliance monitoring. Being able to monitor MCO-level variances across a myriad of variables (e.g., enrollment, services) is important to ensure the right balance of cost and outcomes.
- ◆ **CMS Interoperability and Patient Access Final Rule module**—Understanding the complexity of the rules, technology, and data management implications can be daunting for all, departments and vendors alike, in supporting CMS Interoperability. Many states have already released or are planning to release RFPs for their own HL7 FHIR (Fast Health Interoperability Resources) implementations. Additionally, many departments have started hiring expertise in-house to manage these projects across various skill areas, including project management, technology, and data management. We recommend BMS to consider a similar strategy.

4.2.3 SAS' Medicaid Enterprise Solutions

Describe Medicaid Enterprise solutions your organization provides or is developing that BMS should consider during its roadmap planning. BMS is interested in learning about the following:

The Centers for Medicaid and Medicare Services (CMS) now requires the use of a modular, flexible approach to systems development that emphasizes Commercial-off-the-Shelf (COTS) software and discourages over-customization. We encourage BMS to pursue vendors that have demonstrated the successful reuse of components and technologies already developed and have proven successful in production, but also offer the flexibility to adapt to unique state policies, standards, and business requirements. SAS solutions have been implemented for over 83,000 customers in all 50 states. Most recently, SAS successfully implemented the **Enterprise Data Warehouse (EDW) and Decision Support System (DSS) module** for South Carolina Department of Health and Human Services, and currently has an in-process implementation of the EDW and Data Analytics and Reporting (DAR) module for the Wisconsin Department of Health Services.

In addition to providing EDW solutions for state Medicaid agencies, SAS also provides a **Program Integrity module** to support states in their effort to fight fraud, waste, and abuse. The SAS solution includes the use of predictive modeling, provider profiling, trend analysis,

and other analytics to identify providers with a high likelihood of fraud, abuse, or error, and prevent payments on potentially fraudulent or erroneous claims from being made until such claims have been validated.

Combined, our EDW, DSS, and Program Integrity modules provide a single integrated platform that aggregates data from multiple sources, normalizes this data and creates actionable results that impact state Medicaid and other government-funded program operations. Our solution creates member health analytics and provides in-depth, outcome-based results applied to state Medicaid and PI programs. This enterprise approach enables any state user with the appropriate permissions to have immediate, real-time analytics access generated by the SAS solution.

1. The Medicaid Enterprise business processes or discrete functionalities targeted by the Medicaid Enterprise solution.

Our solutions are compliant with MITA 3.0 and CMS's Seven Conditions and Standards. Our solutions provide the following architectural components configured to meet the needs of the state:

- ◆ **A Business Architecture**—delivers the business process capabilities required to support the reporting and analytic functions of a modern Medicaid enterprise
- ◆ **An Information Architecture**—supports business processes by providing data as the raw material used by these processes to yield actionable information
- ◆ **A Technical Architecture**—provides the modern cloud-native hardware and software infrastructure needed to implement the defined business processes and information needs

We understand, as directed by CMS, states are engaged in a long-term mission to advance their business processes to higher levels of MITA maturity. High levels of maturity require more data, intuitive data visualization, and advanced analytics—not merely static reporting. The SAS solution delivers the reporting and analytics required for BMS to advance in MITA maturity in a single high-powered and easy to use platform. These reporting and analytics functions incorporate appropriate AI & ML in the SAS toolsets. This is standard, not an add-on feature, and aids in achieving the higher MITA maturity levels at a faster pace.

Our solutions will directly support BMS in its MITA maturity journey across several MITA business areas, such as Care Management, Financial Management, Operations Management, and Performance Management. While our solutions are not directly responsible for the business processes, our solutions directly impact and support the enhancement and efficiency of the business processes managed by other systems, such as the MMIS or Eligibility system. Because our solution is interoperable and can easily exchange data, integration with other MES modules can be achieved with collaborative effort with BMS partners.

2. How the Medicaid Enterprise solution is packaged (i.e., commercial-off-the-shelf (COTS) or proprietary; modular or tightly integrated; cloud or local).

The SAS solution is packaged as a commercial-off-the-shelf (COTS) product that encourages configuration over customization. It is a modern cloud-native architecture and single-platform for integrating data, managing metadata, and building and consuming content such as reports and analytics. This allows for simplified installation and administration as well as providing seamless integration throughout the solution without the complex integration of multiple legacy data management (e.g., Informatica, Talend, IBM), business intelligence (e.g.,

Cognos, Business Objects), and advanced analytic tools. **SAS is your one-stop shop** for data management, business intelligence, and artificial intelligence.

BMS will be best served by solutions that are cloud native and COTS that are configured and not developed. Solutions should be provided as a fully managed service, inclusive of Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) or Software-as-a-Service (SaaS) capabilities. These services should be pre-integrated and include built-in configuration management and artificial intelligence/machine learning (AI/ML) functions. SAS recommends using containerized microservices, which are the foundation of what it means to be “cloud native.” Extensive cloud services integration, using Kubernetes orchestration, are tied into cloud authentication, storage, and management systems. We recommend an architecture that leverages microservices, is scalable, fully governed, and increases access to high powered capabilities to both novice and advanced users in a single unified platform.

3. How the Medicaid Enterprise solution is priced (please include methodology only, e.g., Per Member per Month, fixed price per year, data usage—please do not provide actual purchase prices).

Our MES solutions are priced as firm fixed price based on DDI scope and O&M support.

4. In how many states is your Medicaid Enterprise solution currently deployed, or expected to be deployed, and how long has it been in use.

SAS software is currently in use by various state & local agencies in all 50 states. However, our MES modules (EDW/DSS, and Program Integrity) are currently deployed or expected to be deployed in the following state departments:

| State | Module | Status | DDI Start Date |
|-----------------------------------|-------------------------------------|---------------|--------------------------|
| South Carolina DHHS | EDW/DSS & Program Integrity | CMS Certified | 11/30/2018 |
| Wisconsin DHS | EDW/DSS & Program Integrity | In DDI | 10/6/2020; 11/30/2021 |
| Oregon Health Authority | Program Integrity & Case Management | Deployed | 05/26/2021 |
| Maryland DHS | Program Integrity | In DDI | 1/3/2022 |
| Texas Office of Inspector General | Program Integrity | In DDI | 12/16/2021 |

5. Configurations and customizations typically requested to adapt the product for use in a State Medicaid Program.

Our MES solutions come with several out-the-box capabilities, such as fraud algorithms, healthcare measures, reports, dashboards, and accelerators for more complex workflows (e.g., T-MSIS). However, typical configurations requested for our solutions include:

- ◆ Configuration of our healthcare analytic data model
- ◆ Configuration of interfaces with data suppliers
- ◆ Configuration of fraud algorithms
- ◆ Configuration or customization of healthcare measures (e.g., Quality outcomes)
- ◆ Configuration or customization of reports and dashboards

While there is commonality within Medicaid, our solutions can adapt to the various nuances of each state program. We recommend BMS to select vendors with proven solutions implemented in other states built on a modern technical architecture and platform. Many

vendors still heavily use proprietary processes and legacy technology that are black box. The SAS solution is white box and provides the same tools to both the user community and the vendor team building the solution.

6. Technical architecture and processing capacity/scalability.

Microservices are self-contained, lightweight pieces of software that do only one thing. They operate independently from one another and are stateless, allowing for many instances to run simultaneously. Microservice architecture is critical to the SAS platform—achieving scalability and performance regardless of the size of data or complexity of model. This architecture aligns to the CMS seven conditions and standards. It is interoperable with other systems in the Medicaid enterprise and enables them to interact with the SAS platform over industry standard web service protocols directly (APIs) or via an enterprise service bus (ESB).

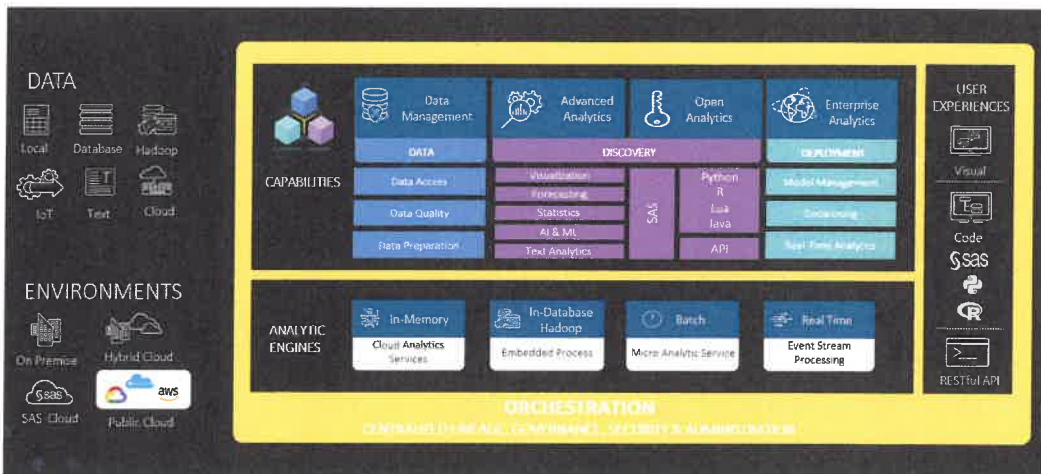


Figure 2. Microservice Architecture

We recommend solutions that take a flexible approach to cloud based and on-premises deployments hinged on a platform that is built on cloud-native (e.g., Kubernetes, containerization, microservice) technologies. This will ensure flexibility for both the Department and the vendor community to deliver solutions on the most optimal environment (e.g., Public cloud, Private cloud, Hosted, and On-premises). The most modern solutions are cloud-agnostic and can be deployed across various Kubernetes flavors (e.g., RedHat OpenShift, Azure Kubernetes Service, AWS Kubernetes). This recommendation aligns with the concept of the hybrid cloud. In this way, the Department does not lock itself into a single cloud vendor but can readily shift workload among the multiple cloud providers.

7. User-facing and self-service capabilities.

The SAS platform is highly visual and enables business analysts to quickly assess possible outcomes or estimate unknown parameters to support better decisions. Powerful, yet easy-to-use capabilities include:

- ◆ A simple drag-and-drop process empowers users to go beyond traditional reporting and visualization solutions by making the power of advanced analytics – including, AI and ML – consumable by non-coder business users.
- ◆ Using either the point-and-click interface or the programming interface, users can easily identify predictive drivers among multiple explanatory variables, and visually discover and understand outliers and data discrepancies. This ensures that business users get the

answers they need when they need them, and specialists are not burdened with constant requests for analyses.

Additionally, for more advanced users, our solution provides support for multiple programming languages through the integration of open-source technologies that differentiates us in the market. Our unifying platform makes it seamless for customers to integrate AI results and analytics into their business easily, quickly and at scale. [Main benefit here is a single tool that can manage analytic models across multiple languages, without integration of multiple tools, interfaces, and data connectors—improving efficiency for the business users.](#)

8. Interface support, flexibility, and extensibility to other stakeholders and State agencies.

SAS works with our customers to understand overall MES interface requirements, internal and external data trading partners, and other stakeholders or agencies looking to integrate with our modules. Simply put, our solution is built on modern service-oriented architecture and incorporates APIs and other mechanisms (e.g., messages, web services, legacy file transfers) to support the secure exchange of data. Our solution does not limit or price by the # of users, so extending access to other agencies and expanding the solution to support other agency business processes and data can be achieved by our highly scalable platform.

4.2.4 Benefits and Risks of Business Process Outsourcing

What do you see as the benefits and risks of including business process outsourcing (BPO) services together with technical services?

State Medicaid agencies commonly use business process outsourcing (BPO) as part of Medicaid modernization. Historically, states have outsourced only a narrow set of functions, such as Third Party Liability (TPL), which BMS did in 1994, and Pharmacy Benefit Management (PBM). These functions have a well-defined and self-contained scope, and there are vendors that specialize in these areas. That makes BPO a straightforward proposition.

It is becoming more common for states to outsource part – or all – of the IT support functions to operate Medicaid IT systems. In the past 12 months, there is a distinct trend for states to move toward public cloud hosting environments. Many states are also moving toward IT managed services for operations and maintenance.

Like many states, BMS may be facing difficulty in recruiting and retaining staff who have the skills and experience needed to manage the Medicaid program. Hence, BPO can be an attractive option for BMS to overcome the staffing obstacle.

In our experience, adopting BPO in Medicaid modernization succeeds only when ALL of the following conditions are met:

- ◆ **The business process is well-defined.** The business function/process has a well-defined flow and a clear definition of who is responsible for each step in the process flow. This is particularly true for when exceptions arise that may require special handling or consideration.
- ◆ **The business process is self-contained.** The business function/process has clear boundaries and clear lines of responsibilities, AND there are few hand-off points between BMS and vendor(s) within the process. Having minimal, clear hand-off points between BMS and vendor(s) enables easy management of BPO contract responsibilities. It also

minimizes the risk that members receive poor service because of failure points within the process.

- ◆ **Revamping of business processes is part of scope.** As the initial step in BPO, a state should work jointly with a vendor(s) to model the future-state business process for the function being outsourced. BMS should not assume that an outsourcing vendor will make any changes to business processes unless prompted by the state. Jointly defining the new process flow creates a way of operating that is well-defined, self-contained, and commonly-understood.
- ◆ **SLA's are clearly defined, and a measuring system is in place.** States that succeed in outsourcing always have clear service level agreements (SLA's) in place. These SLA's have clear metrics. And, the state and vendor establish a measuring system for capturing the metrics on a timely and accurate basis.

BMS can obtain significant benefits from BPO. If BMS shifts the burden of recruiting and training qualified employees to the outsourcing vendor, BMS gains efficiencies without creating a burden for its existing resources.

However, there are risks to outsourcing. BMS may lose knowledge and experience in how to administer the Medicaid program; so knowledge transfer must be memorialized. BMS also must be sure to build expertise in managing vendor contracts, monitoring performance, and seeking corrective action, when needed. This is a skillset that many states take for granted, and they do not invest in the types of skilled resources who manage vendors well. A final risk is vendor lock-in—in which a vendor becomes so entrenched at BMS that it is impractical for you to consider replacing one vendor with any other.

Our team has ideas for functions that BMS might consider as outsourcing candidates—ones that go beyond the traditional TPL, PBM, and public cloud hosting paths that many states take. We welcome the chance to discuss these ideas with you.

4.2.5 CMS Certification Experience

Describe your experience, if any, with CMS Outcomes-Based Certification or Streamlined Modular Certification.

SAS is assisting a current client in managing and executing the Centers for Medicare and Medicaid Services (CMS) certification activities according to Federal guidance and requirements contained within the CMS Streamlining Modular Certification (SMC) Medicaid Enterprise Systems (MES) Guidance (SMC Appendices A-D) and other sub-regulatory guidance provided by CMS for a new EDW/DAR project to achieve certification. Because of the recent shift in approach to CMS certification, SAS is on the forefront along with our client and CMS on executing within this new approach for outcomes-based certification. Our most recent certification attainment experience occurred in the state of South Carolina in assisting with their February of 2020 CMS certification for their Business Intelligence System (BIS).

SAS, working with the client Certification Team, gathers evidence for submission to CMS, include the following:

- ◆ Collecting data, documentation, and report artifacts required for the preliminary letter submission to CMS as well as all certification milestones and milestone reviews.
- ◆ Providing source documentation to the client and preparing certification folders that include the EDW & analytic specific State Medicaid Manual (SMM) and CMS required documentation, reports, and crosswalks.

- ◆ Participating in CMS site visits including provision of system access and walkthroughs for the federal certification team.
- ◆ Preparing and developing a cross-reference matrix of the EDW & analytics required data elements for each certification milestone or milestone review.
- ◆ Providing onsite resources to assist the client in certification procedures and collection of any information needed for the State to make certification presentations.
- ◆ Reviewing state outcomes metrics, help states determine evaluation criteria and evidence(s), and determine performance metrics; producing evidence for outcomes and metrics for the State for ongoing system monitoring.

Currently we are working with clients to determine evidence that will be supplied to support the State Outcomes and Metrics. Prior to the Operational Readiness Review (ORR) and the Final Certification Review (CR) SAS will ensure the client and SAS subject matter experts (SMEs) have been trained for demonstrating the capabilities of the EDW and analytic tools. This includes completing internal SAS demonstration dry runs and other preparation activities to ensure that SAS SMEs are prepared to assist the client through the Certification process.

SAS works with the state SMEs to ensure they are prepared to demonstrate their readiness and knowledge to use the tools through a series of joint SAS and BMS dry runs. SAS SMEs will participate in the Operational Readiness Review (ORR) and Certification Review (CR) certification process to ensure all CMS questions are answered satisfactorily, and any items that need further clarification or evidence are delivered within the expected timeframes.

4.2.6 Consistency in Business Process Functions and Data Architecture

What approaches to supporting consistency in business process functions and data architecture across multiple systems and vendors have you encountered?

A holistic, enterprise view of the information architecture of the MES is critical in supporting consistency across multi-vendor systems. Unfortunately, each vendor typically has standard approaches, which often become constraints to how ingress/egress of data can exchange. A few strategies where we've experienced success with include:

- ◆ **Data Management Strategy & Roadmap**— SAS believes that discipline in applying data management activities builds and maintains a foundation for meeting overall business objectives. To this end, SAS offers management consulting services that provide a review of current organizational and technology practices aligned to data management proven methodologies and then recommends what gaps need to be addressed to enable delivery of business objectives. SAS focuses attention on each of the data management capabilities as well as business engagement/process and data governance in a three-part engagement.
- ◆ **Architecture Review Board (ARB)**—involving key stakeholders and technical leaders from vendors, with overall leadership coming from client technical leadership (e.g., CTO, CIO). This will ensure all systems understand overall technical architecture (how?), information architecture (what data?), and business architecture (why or business purpose?) of the business process/function.

- ◆ **Enterprise Architecture**—establishing core technical principles and standards to which the overall Medicaid Enterprise System should adhere. This along with the ARB drives technical reviews of interfaces and data architecture
- ◆ **System Integrator**—interacting with an experienced system integrator with well-established and proven delivery of systems integration, specifically Enterprise Service Bus (ESB) technologies, Enterprise Application Interface (EAI) methodology, or microservices. A system integrator should be able to receive information from one system and apply transformations or business rules so that data can be sent to another system for interoperability and operational efficiency. This approach decouples custom business logic within each module and allows consistency in the interfaces as MES modules evolve over time.
- ◆ **Adoption of Industry Standards**—use of industry standard data formats (HL7 FHIR, 837, JSON, XML) will provide a more seamless transaction of data. Often slight configuration or customizations will be required to map data to appropriate target formats and can be done via tool or custom code (e.g., Java, python). System Integrators can often handle this translation within an ESB or EAI interface to further streamline the integration between systems.

4.2.7 Ongoing Compliance with CMS

Please provide your recommended strategy for ongoing compliance with the CMS Interoperability and Patient Access final rule (CMS-9115-F). The rule can be found at the following location: <https://www.cms.gov/files/document/cms-9115-f.pdf>.

The roadmap initiated by CMS for improving interoperability and health information access and exchange between payers, patients, and providers is inspiring. SAS is in complete alignment with this initiative. Our R&D teams are actively enabling our SAS solution to integrate directly with FHIR APIs. Additionally, our healthcare industry consultants work on specific applications to use this data for various healthcare-related cases. This initiative, if done correctly, will bring great opportunities for improved care coordination, health outcomes, access to care, and quality care. Therefore, SAS recommends the following critical considerations as states plan their compliance with CMS-9115-F:

- ◆ Consider releasing a separate module specifically for the technical implementation of the end-to-end FHIR implementation, with inclusion of U.S. Core Data for Interoperability Standard (USCDI) as a key component. Many states have already begun planning and implementation around this specification. The FHIR Da Vinci Project implementation guides provide a set of use cases to support CMS-9115-F compliance.
- ◆ CMS Interoperability solutions should include data management for transforming administrative claims (FFS->FHIR) to FHIR format, FHIR APIs that are compliant with the CMS rule and policies, data storage/repository, and a Consent Management System. In addition, we recommend FHIR solutions that are cloud-native (e.g., Azure Healthcare APIs) and can scale as needed.
- ◆ Be clear how each MES module should support the CMS Interoperability Rule requirements within each RFP. For example, we recommend that EDW and Program Integrity modules include connecting, collecting, and analyzing FHIR data as a requirement to enhance administrative claims data analytics with clinical information.

4.2.8 HIPAA and FedRAMP Compliance

Provide your strategy for compliance with the Health Insurance Portability and Accountability Act (HIPAA) and Federal Risk and Authorization Management Program (FedRAMP) Requirements.

*Information about HIPAA compliance can be found at the following location:
<https://www.hhs.gov/hipaa/for-professionals/privacy/index.html>. Information about
FedRAMP can be found on www.fedramp.gov.*

As a Business Associate of healthcare agencies, SAS and our subcontractors are bound by HIPAA Privacy and Security rules. In accordance with the Privacy rule, we defend Protected Health Information (PHI) from disclosure, allowing dissemination only to entities explicitly authorized by our clients. Our strategy for compliance with HIPAA and FedRAMP requirements is based on the principle of least privilege to ensure that users only have the necessary access to complete their job functions.

To be compliant with HIPAA and FedRAMP, our data privacy and security architecture, processes, and policies adhere to NIST 800-53 rev4 (moderate), SOC 2 type II compliance, and FIPS 140-2 as the foundation. FedRAMP specific controls above NIST 800-53 (on which it is based) is more of an "optional" based on the specific customer and their security needs. FedRAMP adds considerable cost to the overall solution and services and SAS recommends state government agencies to consider the following factors:

- ◆ FedRAMP certification can only be achieved through a sponsorship with a federal agency or Joint Authorization Board (JAB) for an Authority to Operate (ATO) or Provisional Authority to Operate (P-ATO) of cloud services. The list of FedRAMP authorized cloud service offerings (247 authorized services as of today) would limit the overall technology, platforms, and capabilities available in the market today to provide the most optimal solution for BMS and would prohibit competitive bids.
- ◆ If requiring FedRAMP, we recommend BMS be very clear on the FedRAMP levels (IaaS, PaaS, SaaS) and certified cloud service offerings that are required as part of the RFP procurement. List of current authorized cloud service offerings can be found at the [FedRAMP Market Place](#). SAS is currently in process of achieving certification of our PaaS authorization.

Our recommendation is for states to incorporate FedRAMP authorization within commercial cloud solutions only at the Infrastructure layer. Any additional FedRAMP authorized solutions at the platform or software layer should be optional or "nice to have", but not mandatory. National standards such as HIPAA, NIST 800-53, ISO 27001, SOC, etc. should be the foundation for mandatory security requirements. Further, if the state is allowing vendors to host solutions in their private cloud, FedRAMP authorization of such solutions should only be optional, of course assuming the vendor has a proven track record hosting, managing, and protecting PHI/PII data. This will provide:

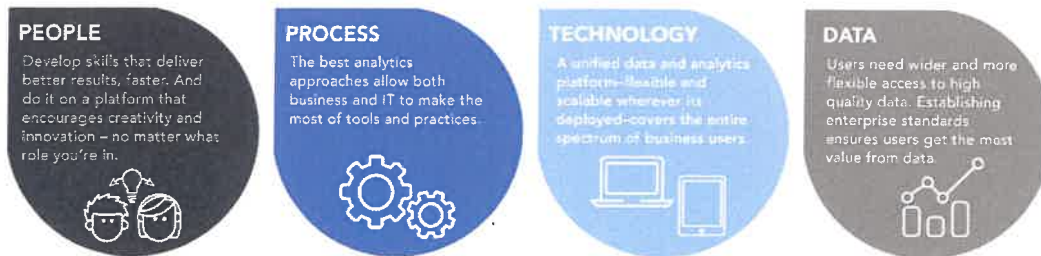
- ◆ More competitive bids with more vendor interest
- ◆ Reduced overall cost of the services and solution
- ◆ Availability of wider variety of technology, solutions, and services

4.2.9 Achieving Compliance with CMS

Provide your strategy for assisting states in achieving compliance with CMS, and federal rules, regulations, and guidance related to modularity, leverage, reuse, and outcomes achievement.

Compliance with CMS and federal rules, regulations, and guidance is top of mind at every step of our implementation. SAS' comprehensive strategy for assisting BMS in achieving federal certification and receiving maximum Federal Financial Participation is woven throughout our people, process, and technology.

WINNING COMBINATION



People: SAS offers a veteran implementation team with deep understanding of federal certification and extensive experience in guiding projects to align with CMS rules and regulations. Our certification managers draw on experience with certification in several previous states, including assisting states in navigating CMS' new Outcomes-Based Certification (OBC) methodology via the creation of outcomes statements, test case identification, and assessment of operational data.

From day one of the project, SAS will identify a federal certification lead that will be responsible for the certification management approach as well as conducting certification readiness planning and meetings throughout the DDI phase. The SAS certification lead will support all CMS certification activities and be empowered to pull resources from the rest of the SAS team as needed. Additionally, SAS subject matter experts (both business and technical) will be made available to BMS as needed to answer questions, complete checklists, create artifacts, provide insight, and be present for in-person interviews throughout the certification process.

Process: SAS understands that achieving compliance with ever-changing CMS and federal rules begins at the very start of the project, not at the beginning of operations. During Phase I of implementation, we will develop a certification management approach, which defines our proven systematic approach for obtaining federal certification. This approach ensures roles and responsibilities for all stakeholders to ensure federal certification is achieved. The approach accounts for all certification task phases, artifacts, and activities including, but not limited to data acquisition, reporting, training, documentation, and milestone reviews. The certification approach will further include all federal certification requirements outlined in the state Medicaid manual (SMM), all gate review requirements required by CMS under the Medicaid enterprise certification lifecycle (MECL), and/or all outcome statements, evaluation criteria, and key performance indicators required under Outcomes-Based Certification.

Technology: The SAS solution is based on a highly available, n-tier architecture that separates web, application, and database components into independent tiers pursuant to both MITA and CMS' three-tier architecture. Other key features for ensuring certification, include:

- ◆ **Data model:** SAS leverages a proven healthcare data model, tailored to BMS' specific business domains, that not only aligns with MITA and the CMS seven conditions and standards, but also results in faster implementation and quicker analytic results.
- ◆ **Interoperability:** Our solution follows MITA principles by using and exposing reusable, modular web services for presenting information to end users.
- ◆ **Microservice architecture:** The SAS solution is based on a microservice architecture that allows for a modular, flexible approach to systems development across the enterprise.

Data: Perhaps most important, given the shift towards Outcomes-Based Certification, is the SAS Solution's ability to assist states in their mission to ensure Medicaid Enterprise Systems (MES) modules that receive federal financial participation are meeting the business needs of the state while reducing burdens. Outcome-based certification is structured around outcome statements, evaluation criteria and supporting evidence and ongoing monitoring of KPIs. Our team works with our client to understand the overall MES modernization roadmap, understand state-specific business outcomes and metrics, then identify areas where our solution can enhance, optimize, and automate business functions. We then apply our subject matter expertise (people), analytic insights (process), our SAS platform (technology) and business intelligence (data) to deliver the require evidence (e.g., KPIs) to ensure your technology investments advance CMS and state specific measures.

4.2.10 Disaster Recovery Approaches

What approaches do you suggest for Disaster Recovery processes in a modular MES that accounts for integration and communication across multiple partners?

We suggest System Integrators (SI) take the lead on the overall MES disaster recovery testing process, if and only when multiple MES modules communicate across multiple partners. This should ensure that during disaster recovery testing modules can continue to process workloads when one of the modules fails. The SI should plan accordingly each of the tests for the interfaces managed by the SI between multiple modules, working with each vendor on test plan, timing, schedule, and execution. Lastly, each vendor should have their own Disaster Recovery plan and testing execution plans that can be incorporated with the SI as needed.

We also recommend states to be very clear on critical vs. non-critical applications as vague Disaster Recovery requirements can quickly raise the overall cost of the solution which may not be necessary based on the business need/criticality. Recovery Point Objectives (RPO) and Recovery Time Objectives (RTO) should be based on criticality of the solution in relationship to business functions. If categorization of business functionality/criticality cannot be provided with the RFP, we suggest making that negotiable during the implementation as the solution is designed.

For EDW, analytic, and Program Integrity modules, we recommend the business criticality be more focused on the RPO of data, with 24 hours as the standard. RTO times should be less stringent as high-available architectures using multiple data centers/availability zones within a geographic region make catastrophic events less likely. RTO of 72 hours or greater should be sufficient and will keep DR costs down as Hot/Warm or Hot/Hot environments will not be required.

4.2.11 Organizational Change and Communication Management

What organizational change and communications management processes have you seen employed for a modernized, multi-vendor MES implementation? How would you help support the evolution of the Medicaid Enterprise as a whole?

Organizational Change Management and Communications Management is critical to the success of systems' modernization efforts. Many other modernization projects in Health and Human Services, such as Child Welfare, often contain a component of Organizational Change Management, due to the high volume of changes to the case management process and user workflows (e.g., case workers, supervisors). Depending on the type of module, it can be

important to incorporate OCM as part of the scope of the project or alternatively release a separate OCM procurement from a qualified OCM vendor.

Communications management should be part of every module and is important to how changes within the system are communicated to stakeholders. Over time, modules will evolve and those changes can impact users, business processes, and integration with other modules. Lastly, for EDW, DSS, and Program Integrity modules, SAS believes effective UAT and on-going training of our user friendly solutions, will be sufficient and will keep overall project costs and schedules controlled.

4.2.12 DDI Management

How does a multi-vendor environment change how you manage your own Design, Development, and Implementation (DDI) work? How should dependencies be identified, negotiated, and implemented in a multi-vendor environment?

As a leader in EDW, reporting and analytics solutions, SAS understands the complexity and challenges of integrating MES modules and data. BMS will be best served by solutions that are cloud native and COTS. Modules should be configured, not developed during DDI and offer business value early in the project timeline. Modules should be packaged as Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) or Software-as-a-Service (SaaS). As cloud native solutions, modules should use containerized microservices and should be fully scalable and fully governed. Setting the architecture vision will help set expectations for how modules should integrate in DDI and Operations.

The SAS solution can be very helpful to BMS in a multi-vendor environment by providing a foundation of industry leading data management and analytic capabilities that will help BMS understand and improve the operation of business process modules. Using SAS during DDI and Operations of MES modules will give BMS the ability to evaluate the data and results of a new implementation so issues can be found and mitigated as soon as possible.

SAS has deep experience working in multi-vendor environments. SAS provides an end-to-end solution on a single unified platform (PaaS) and working with other modules does not fundamentally change the implementation of SAS. We will highlight key dependencies in our plan and will help BMS manage the risks that come with multi-vendor environments. Effective and efficient data exchange between vendor modules is key to success overall and these are some of the approaches to consider:

- ◆ Data Use Agreements (and/or other data sharing compliance steps) are executed as soon as possible, data is available to the dependent module very early in its implementation timeline—this avoids delays, misunderstood requirements and rework.
- ◆ Security policies are updated for the new environment before work begins – this will avoid building policies on the fly as new roles are identified for user access, new data exchanges are implemented, etc.
- ◆ Systems Integration and PMO responsibilities are agreed upon and finalized prior to project initiation. This includes overarching System and Integration Testing between modules, Operational Readiness Testing, and establishing critical path planning for the MES – this will significantly reduce the likelihood of post go-live issues.
- ◆ Put language into vendor contracts that make successful transfer of analytic-ready data from source data providers a performance measure—SAS is typically on the receiving end of data from business processes and, in our experience, contract terms in each vendor contract around downstream data dependencies help prioritize the success of MES overall.

- ◆ BMS should have the ability to independently analyze the data during DDI to ensure data quality and outcomes of MES modules are validated before go-live—this is one area the SAS solution will provide impactful benefits.
- ◆ Recognize that change is inevitable and build in a modification pool of hours during the operations and maintenance period to allow BMS to adapt to new or modified requirements and modules are implemented.

All the functionality needed to start using your data to drive better decisions is built-in/out-of-the-box in the SAS solution. We recommend SAS as a foundational tool that will help BMS achieve its MES vision.

4.2.13 Experience with Collaboration Tools

Describe your experience, if any, with collaboration tool(s) such as or equal to Jira®, Confluence, and IBM® Rational Team Concert (RTC) or other tools to track items, which include, but are not limited to, project milestones, deliverables, and/or implementation testing. Do you recommend any specific approaches or tool(s) for collaboration in a multi-vendor environment? Does your company prefer using its own collaboration tool(s) to support an implementation, or do you prefer using collaboration tool(s) provided by a state and/or a systems integrator (SI)?

SAS has extensive experience with collaboration tools such as JIRA, Confluence, and SharePoint.

SAS uses **JIRA** for issue tracking and as project management application with a focus on task assignment, tracking, change management, approvals, and overall task/issue status. JIRA is a preferred tool for SAS and is fully integrated in SAS system monitoring process for alerts.

Jira is a feature-rich product that provides the following:

- ◆ Ability to manage all project issues, features, tasks, and improvements and track signoff
- ◆ Ability to track components and versions
- ◆ Highly customizable dashboard views and workflows
- ◆ Full text searching and filtering
- ◆ Automatically generated project roadmaps
- ◆ User/group permissions and security
- ◆ Ability to add file attachments to issues
- ◆ Highly configurable email notification of ticket updates

SAS uses **Confluence** as our proven document management system, providing hosted delivery of documents to our customers. It leverages the group permissions defined in Jira to control access to document spaces. It provides:

- ◆ Fine grained security with space and page level permissions
- ◆ Hyperlinking between documents
- ◆ Searchable pages and attachments secure versioning of all documents, including attachments, by maintaining a history of the changes from one version to the next

The **Project Repository** on SAS Confluence is a web-based system that offers advanced search capabilities and creates a comprehensive repository of documents and other materials related to the project. SAS updates and versions the content of these items so the information is current and relevant. The site contains at a minimum:

- ◆ Contact/Phone Lists
- ◆ Communication Plan

- ◆ Requirements Traceability Matrix (RTM)
- ◆ Business Process Models
- ◆ Workflow Design
- ◆ Functional and Technical design documents (FDD and TDD) and test plans
- ◆ Schedules and calendars
- ◆ Microsoft Project plan
- ◆ Minutes and agendas
- ◆ Lessons learned documentation
- ◆ Customer provided documentation (policy, business, etc.)
- ◆ System documentation
- ◆ Change orders and related documents
- ◆ All Deliverables

Similarly to Confluence, **SharePoint** is used as a Project Repository for On Premises customers.

Through the use of Jira, Confluence, SharePoint and in alignment with a mutually agreeable communication plan, we will work with customers to develop procedures to share all project information in a timely manner across the Customer and SAS organizations to reduce siloes and create best practices throughout the project.

Although JIRA and Confluence are our preferred tools, we will work with customers and vendors to adopt the best, most appropriate collaboration tool.

For multi-vendor environments, establishing a cross-vendor communication plan will be key to ensuring effective collaboration.

4.2.14 System Integrator Roles and Responsibilities

What roles and responsibilities have you seen for a system integrator (SI) in a modular systems environment? Was this role fulfilled by a separate vendor, incorporated with other services, or performed by the state Medicaid agency itself? What are the key success factors and risks to success related to using a SI?

Over the past 10 years, states have reviewed the roles of System Integrator's (SI) continuously. The current belief of most state agencies, as demonstrated in their RFP releases, is the SI role is too important for the success of the other MES modules to allow the SI to pick up additional work of other modules. The key success factor is by limiting the SI only to the integration oversight of the other modules, no conflict of interest is created. The SI can objectively report and coordinate across the multiple vendors. Any state MES project is complex. By prioritizing the SI module procurement first, the other modules can then be systemically implemented and coordinated across multiple vendors. The most recent examples of RFPs precluding the SI from responding to other MES modules is found in the TennCare Data Ecosystem and Fraud Waste and abuse RFPs where the SI – Deloitte – was precluded from bidding on other modules. Other states who have excluded or limited SIs from bidding other components of the MES modules include, Alabama, Colorado, New Mexico, and North Carolina.

In our experience, the following factors are critical to the success of the SI:

- ◆ The SI should be conflicted out of bidding on other MES Modules. This restriction ensures that the SI keeps a focus on the success of all modules and does not favor the modules for which it is contracted to deliver.
- ◆ Extensive experience delivering MES solutions, as a technology platform alone is not enough to handle the complexity of connecting Medicaid/HHS modules.
- ◆ Performance of the SI is evaluated by the enterprise-wide success not the success of one component or module. The SI is responsible for ensuring the end-to-end operation of the MES performs as required and can be easily maintained.
- ◆ The SI has oversight responsibility for end-to-end testing to assure operational readiness of the MES, managing defects affecting MES operations and for impact analysis for changes to the MES.
- ◆ The SI is responsible for establishing an enterprise framework that supports both interoperability and modularity with the flexibility to scale and swap out modules without disrupting the MES operational stability.
- ◆ The SI must implement a framework that supports both legacy and modernized systems and aid the Department in achieving modernization initiatives.

In summary, each of the MES modular components are important. While some economies of scale can occur by one vendor having multiple modules to execute, we strongly recommend that the SI module be kept distinctly separated from the rest of the modules due to the issues noted above. A lot depends upon the success of the SI.

4.2.15 Vulnerability Scans Recommendations

Describe your depth, breadth, and frequency recommendations for performing periodic vulnerability scans of production and development environments?

SAS recommends a [continuous monitoring strategy](#) for all environments, which includes the reporting of applicable privacy and security controls to the customer and/or applicable regulatory organization. Ongoing internal security monitoring and assessments are performed in accordance with the security categorization of the information system.

Activities conducted, in partnership with our customers may include:

- ◆ Assessing vulnerability scan output and determining remediation activities and owners
- ◆ Alerts from vendors or security agencies that require remediation
- ◆ Installation of security patches
- ◆ Account reviews
- ◆ Review of reports generated from the logging and monitoring solutions

The results of these internal security and monitoring activities are reported regularly to our customers. Material changes in the environment are reflected and updated in both internal and external documentation (for example, inventories, diagrams, and procedures). A continuous monitoring strategy is used throughout the system delivery life cycle.

Lastly, because many solutions are likely based on commercial-off-the-shelf (COTS) products, the specific COTS application source code would not be scanned. The product owners or vendors developing the COTS products are responsible for such vulnerability (both static and dynamic) of their software. However, rest assured that COTS solutions have gone through rigorous security testing as part of each major and minor release.

4.2.16 Optimal Data Sharing throughout MES

What processes, techniques, and solutions does your organization consider critical for delivering optimal data sharing throughout the MES?

Effective and efficient data sharing is critical for the MES. SAS recommends that BMS have an As-Is/To-Be vision that considers both the legacy data sharing requirements and the modernized vision for data sharing in the MES. Requirements should detail legacy batch processes, incremental and full replacement data streams, specifics on any data conversion, all data formats, and all inbound and outbound data (transactions, reference data, messages, etc.). Vagueness in the data requirements can lead to errors in technical design and scope estimations in vendor responses and misaligned understandings between BMS and the vendor. Where further discovery is needed, we recommend a phase be built into the contract(s) to clarify and adjust data requirements. The SAS solution includes robust data discovery tools with advanced AI assistance that can be applied to all types of data (structured, semi-structured, unstructured).

SAS has extensive experience as a hub for data sharing. The considerations, processes, and solutions we recommend include:

- ◆ Data Use Agreement (DUA) for any data inbound or outbound for a MES module there is a data use agreement in place that governs how the data is exchanged, how is used, how long it is kept, and who has access to it—in the SAS solution the DUA is stored as metadata (easily found and readily available) and amendments are added as versions to show the lifecycle of changes.
- ◆ Interface Control Document (ICD) is the technical counterpart to the DUA so every data exchange has a technical specification that governs how and what data is transferred (frequency, technical protocol, encryption methodology, layout of the data, etc.).
- ◆ Vendor solutions should be able to perform mapping of data from source to target that includes logic for transformations, formatting applied, etc. – SAS offers an ability to map data across multiple data sources with ease so even a non-technical user can swiftly get adept in data mapping functions, data lineage should be automatically generated and viewable in the solution.
- ◆ Maximize use of standard transaction sets and standard interfaces to avoid custom interface development wherever possible—this minimizes development and rework, provides BMS the ability to switch out modules with the minimum impact to MES.
- ◆ Module solutions should provide out-of-the-box connectors and APIs for industry standard data storage and healthcare data formats.
- ◆ Modules should work with existing legacy data as-is to minimize conversion work and/or change requests to systems that will be replaced—the As-Is and To-Be requirements and dependencies should be in the module contracts.
- ◆ Wherever possible the MES should utilize standard transaction formats and APIs to avoid customized interfaces that require development on the source and target side and can be costly to build and maintain.
- ◆ Include scope for FHIR interoperability standards with detail about how, where, when FHIR will be used.

Data classification is an important step to separate and organize data into relevant groups based on their shared characteristics, level of sensitivity, and compliance regulations that apply. Data sharing in a cloud architecture should follow patterns and conditions based on data classification and BMS guidance/approval for data should be shared (i.e. static, direct access, replication, data portal, etc.).

4.2.17 Data Standards and Practices

What standards and practices would you recommend with regards to key data governance, master data management, data stewardship, and data-sharing concerns? What approaches do you recommend for engaging business data owners separately from technical data system managers?

Data governance as an ongoing and evolving process and methodology that should be owned by the BMS. Vendor partners should have the experience (and capabilities built into their solution) to support BMS in performing data governance at whatever level you require. Vendor partners should have Medicaid data governance experience, a robust set of data governance standard processes and controls that can be used/adopted and that integrate with the established BMS governance processes and controls. The solution should provide both business and technical support for:

- ◆ CMS MITA Framework 3.0—a solution has been certified by CMS and aligns with MITA architecture, business processes, data standards, and the seven conditions and standards
- ◆ Data Quality—operational and analytical data quality rules that are out-of-the-box and can be modified/created to apply to the Department data as it arrives and is processed; dashboards and alerts that are published to stakeholders
- ◆ Master Data Management (MDM)—multiple-domain MDM methodology that includes the processes and technology needed to provide a trusted view of critical data assets; using an embedded data quality engine to analyze existing data sources, build a unified view and manage mastered data throughout all stages of its life cycle.
- ◆ Metadata Management—ingest, analyze, and derive metadata for Department data sources; integrate and make available metadata across the entire solution
- ◆ Data Stewardship—work with the data stewards and MES stakeholders throughout the lifecycle of the project to prioritize the metadata that is most important to the business. Involving the data stewards in this process helps ensure that the project is concentrating on the information that is most important to the business.
- ◆ Data Privacy and Security—NIST 800-53, HIPAA, FIPS 140-2, etc.
- ◆ Data Governance—support Data Governance Council (DGC) processes in applying and enforcing strategy, objectives, and policies for the Department
- ◆ Data Architecture—data models based on experience organizing Medicaid data domains for specific business processes and healthcare analytics; conceptual, logical, and physical data models for data marts and other structures to support BMS
- ◆ Data Sharing—stakeholders, both internal and external to BMS, get access to data as approved by you where and when they need it; configurable application rules drive what data is shared, in what form, with the correct data protection

Both technical and business-focused users should be able to search and discover cataloged data assets from multiple data sources. Users should be able to explore data assets for quality and fitness of the data. Users should be able to take actions to further prepare data, create reports, or build models. Key features include:

- ◆ Search and Discover data assets using advanced capability like Elasticsearch
- ◆ Metadata, Data Profiling, Semantic Type
- ◆ Inference Graph database for metadata repository
- ◆ Natural Language & Advanced Search
- ◆ Metadata Measures
- ◆ Descriptive Measures
- ◆ Data Quality Measures
- ◆ Column level graphs

Based on prior experience working on data governance projects with our customers, SAS recommends the following approaches to engaging business users to create your enterprise data catalogue:

- ◆ **Start small**—business users can be leery of projects like this where it may not be clear what value they'll receive for their time. One tip is to gather one to two business users max for each business unit (e.g., financial, program management, provider management, program integrity, etc.). You can even meet with each business unit separately to keep the agenda focused and not wasting other business unit team member's time.
- ◆ **Assign Data Stewards**—assignment of data stewards for business domains, either by identifying and formally acknowledging the work of existing data stewards or appointing new ones. Stewards are critical to clarifying data meanings which is essential when the data is sourced from a wide variety of departments and source systems.
- ◆ **150 terms max (to start)**—to go with the start small theme, many in the industry believe a data catalog for most industries can be covered by at least 150 terms. These will be spread out amongst each business unit.
- ◆ **Start with common reports**—to get the business users to think about which terms are most important/used, have them bring the most common reports or type of reports they run. This will help narrow down on the specific data elements which they use the most.

4.2.18 Fiscal Agent Roles and Responsibilities

Describe your company's current roles and responsibilities as a fiscal agent, if applicable, in a modular systems environment. Describe how you coordinate with other vendors to incorporate their services in a modular systems environment. What are the key success factors and risks for separating Fiscal Intermediary functions from technical functions?

Not Applicable.

4.2.19 Division of Responsibilities for Multi-Vendor Environment

Describe the division of responsibilities on successful projects, in relation to a multi-vendor environment, between vendor and subcontractor Project or Portfolio Management Offices (PMO), and an Enterprise PMO provided by either BMS or a separate vendor?

Multi-vendor environments require clearly defined roles and responsibilities to support successful implementations and operations. The State PMO is accountable for establishing cross vendor communication and facilitating cross vendor dependencies. In previous engagements we have found that it is very important to create repeatable, standard processes that all vendors can follow to ensure effective communication, knowledge transfer and successful, on time coordinated deliveries.

SAS Project Managers work with BMS to document communication plans, dependencies, and roles/responsibilities early in the project. For instance, as the solution vendor, SAS is accountable for configuration, implementation, testing and operation/maintenance of the acquired solution. Additional roles and responsibilities will vary based on the solution procured.

SAS COTS solutions enables states to minimize risk in a multi-vendor environment. SAS solutions are fully developed and tested, have been implemented over 80,000 times and our patented delivery processes provide rapid feedback to customers so that requirements can be validated early and often.

4.2.20 Complex Relationship Management for MES Modules

Describe your recommended approach to addressing the complex relationships between a variety of vendors working on separate parts (or modules) of the overall Medicaid Enterprise System. To what degree do you recommend BMS require these approaches in any RFP(s) it issues?

Managing a multi-vendor environment is not only complex, but requires effective communication, collaboration, and coordination to be successful. For inter-dependencies within MES modules, we recommend the following approaches for BMS to consider:

- ◆ Assign both a project manager and technical resource from BMS staff to act as liaison between working vendors. They should be responsible for scheduling, facilitating, and capturing notes during meetings and raising issues/concerns as needed.
- ◆ PMO and Systems Integrator RFPs should include project management requirements to support module integration efforts and should support BMS in module-to-module project dependencies, scheduling, and coordination.
- ◆ As described in 4.2.6, consider holding Architecture Review Boards (ARBs) with vendor stakeholders to increase collaboration, communication, and transparency throughout the project to ensure successful implementation.

4.2.21 DDI Acceleration Factors

What factors (technologies, development methodologies, frameworks, etc.) would you recommend BMS require in an RFP in order to accelerate the DDI of MES modules?

SAS believes in reducing the time to value as much as possible which is why the SAS solution is delivered ready-to-use on a unified platform that can be quickly deployed in any cloud architecture. The SAS tools used to deliver analytic value as soon as data is available are fully accessible and easy to use—end users can manage data through the analytic lifecycle without coding or specialty application knowledge. SAS project managers utilize our patented Analytic Delivery Approach, which is essentially an iterative waterfall methodology, to provide value to the customer early and throughout DDI. SAS also brings healthcare, fraud and Medicaid specific accelerators to our our projects, including a library of over 1400+ program integrity algorithms, healthcare analytic data model, ETL scripts, and other jobs to support complex workflows such as T-MSIS.

Specific to EDW, analytics, and program integrity, we recommend the following factors to require in future RFPs:

- ◆ Modern cloud-native architecture which leverages Kubernetes, containers, and microservices and that is cloud-agnostic. Solutions built on modern architectures can streamline deployments and provides scalability for future expansion much quicker than manual/legacy system deployment models.
- ◆ Continuous Integration / Continuous Delivery (CI/CD) methodology, which replaces the concept of versioning with the concept of aligned releases. CI/CD is a paradigm where improvements to software are pushed, tested, validated, and deployed to production in a continuous automated manner.
- ◆ Of course, MITA and ITIL Frameworks should continue to be the foundation of the module architecture. Other frameworks, like TOGAF, can be optional (although many vendors utilize TOGAF as standard methodology).

4.2.22 MES RFP Structure for Competition and Innovation

Describe ways you feel BMS should structure an RFP to encourage competition and innovation from Medicaid Enterprise solution bidders.

There is a myriad of issues which cause vendors to not respond to state Medicaid projects. Some of the most prevalent resistance areas include:

- ◆ Budget is not aligned with the desired scope of services: States often engage outside consultants who have limited delivery experience for the creation of the Requests for Proposal (RFP). These organizations query previous state procurements and harmonize the various state projects without:
 - Understanding the differences in the scope of services across different states and their budgets.
 - Investigating the change orders which occur within the first two years of a project to see what changes were trued up with their associated budgets.

Vendors will then resist responding to the proposals since they merely cannot execute the work with the limited funds available. As we have previously addressed in the Executive Summary “Lessons Learned”, the more interaction the states have with the vendors to obtain ranges of cost prior to an RFP release, the more confident BMS will be that the scope and budget align.

- ◆ Key Staff Personnel: States often over-prescribe the amount, type, and qualifications of key staff. The result is smaller vendors cannot respond because they do not have a bench of staff with qualifications that can be listed in an RFP response or show up for oral presentations. Additionally, even larger companies are hampered by the time delay between contract award, contract negotiations with the state, possible protests and appeals and CMS approval. Staff who were available at the delivery of the RFP response might be tasked to other projects that occur from the 6-18 months of delay. Qualified vendors will have numerous people on a modularity project. However, our recommendation is to limit Key Staff as described in our response to 4.2.30.
- ◆ Vendor Experience requires extensive qualifications: The vendor community studies the capabilities of their competitors in very sophisticated ways. The reason is company staff often move from one vendor to another and carry with them the capabilities of their past employers. When a state over prescribes the specific qualifications for experience, the vendor community rapidly ascertains if there is a preference/bias within any state to select a specific vendor. Any vendor who can produce three (3) references of similar scope and size, is qualified to respond to a competitive RFP.
- ◆ Hosting Preferences: The vendor should have a flexible approach to cloud-based and on-premises deployments hinged on solutions that are built on cloud-native (e.g., Kubernetes, containerization, microservice) technologies. This will ensure flexibility for both the Department and the vendor community to deliver solutions on the most optimal environment (e.g., Public cloud, Private cloud, Hosted, and On-premises). The most modern solutions are cloud-agnostic and can be deployed across various Kubernetes flavors (e.g., RedHat OpenShift, Azure Kubernetes Service, AWS Kubernetes). This recommendation aligns with the concept of the hybrid cloud. In this way, the Department does not lock itself into a single cloud vendor but can readily shift workload among the lowest cost cloud providers.

4.2.23 Procurement and Implementation Timelines

What recommendations do you have for establishing procurement and implementation timelines that help deliver value sooner, reduce risk, maximize Federal Financial Participation (FFP), and achieve Outcomes-Based Certification or Streamlined Modular Certification,?

The MES modular projects vary greatly by scope and complexity. Every state Medicaid program is different from the next. An initial important thing for the vendor community is for the state to establish is an RFP schedule that will not fluctuate. The rationale for a well-planned, standing schedule is vendors need to identify staff who will be committed to the project. Fluctuations in timing disrupt vendor staff planning. Additionally, when a state extends a response deadline by one to two weeks, vendors do not have enough time to substantively upgrade their responses. If extensions must happen, vendors need four weeks to edit their responses and produce a final response. Anything less than four weeks results in few substantive changes.

In a similar manner, if a state decides to extend a response date within 48 hours of the previously identified schedule, the vendors are usually executing their final production reviews of the response. It is also common for vendors to submit responses 24-48 hours prior to an RFP response deadline to ensure response upload issues can be resolved with state procurement staff and not jeopardize the response deadline.

As state staff well know, Federal Financial Participation (FFP) funding is maximized during the DDI stage at a 90/10 match rate. Operations and maintenance (O&M) FFP are usually at 75/25 match and might dip as low as 50/50 depending upon the state. Therefore, the more that milestone deliverables can be front loaded, the greater the FFP benefit to the state. Early recognition of software and hardware during the initial few months of DDI commencement directly benefits both the state and the vendors.

Another area that impacts early value to the state is data availability. The earlier that data formats and dictionaries can be provided to the vendors, the quicker vendors will be able to identify quick hits for value. If visibility into the various data sets is delayed, the entire DDI process is impacted until visibility is achieved.

Agreements on requirements also impacts the ability to rapidly deliver value to BMS. Once an award is made, we suggest the state and awarded vendor work on requirements gathering concurrently while executing the contract negotiations. While there is some risk to the state in starting the requirements gathering phase of the project prior to contract approval from CMS, this gathering of requirements speeds up the DDI process.

4.2.24 Major Trends and Innovation in MES Solutions

Describe the major trends in your Medicaid Enterprise solution category that you believe BMS should be aware of, including any product or approach changes that you believe will come to market within the next 12 – 24 months. How do your Medicaid Enterprise solution roadmaps stay current with such trends? If possible, please be specific regarding how these trends affect Medicaid, WVCHIP, or healthcare IT in West Virginia.

SAS Research and Development (R&D) is constantly investing in new innovations in the data management and data science arena, including specific focus in various industries (e.g., Fraud and Security Intelligence, Healthcare, Banking, etc.). With that in mind, our industry consultants, engineers, and product teams are constantly looking at new innovations in the marketplace that can enhance and optimize our own products and services. This may include 3rd party tools, open-source technology, or new

Continuous innovation through reinvestment in R&D and customer commitment has propelled 45 years of consecutive profitability for SAS.

methodologies and frameworks. Here are a few of the upcoming trends we believe BMS should be aware of:

- ◆ **Analytics Engineering**—the concept of applying software development best practices to analytics projects, enabling SQL developers to create and develop clean data sets and data models that are clean, tested, and documented. SAS Studio enables advanced users to create their own data flows, transformations, data models, and orchestrations to curate data for analytic use in a graphical user interface.
- ◆ **Zero Trust Architecture**—from a cyber security perspective, zero trust is becoming very much the standard approach and methodology to how systems are designed. Led by the United States, by 2022, zero trust architecture will grow by 50% to protect national security in democratic and autocratic nations.¹
- ◆ **Democratization of Data**—making data accessible, searchable, and catalogued with enhanced data classification capabilities will continue to trend in the coming years. New tools to make this easier for data governance teams will accelerate this process and bridge the information gap between data and insights. By 2024, 30% of governments globally will double investments in data protection, data governance, and data sharing capabilities to orchestrate a digital ecosystem and speed up the launch of new services.²
- ◆ **Hybrid Workforce**—as the pandemic has forced flexible work and fully remote work arrangements and the “great resignation”, hybrid workforces will allow government agencies to attain and retain the best candidates regardless of location. By 2025, 70% of agencies will support a hybrid workforce at scale, overcoming technical debt and moving beyond protecting the perimeter to securing workers anywhere.³
- ◆ **Rapid Cloud Adoption**—as business and IT roles work more closely together, organizations are quickly adopting cloud technologies. It is becoming a widespread and common practice to place various computing layers into containers rather than into virtual environments. By facilitating the execution of SAS workloads in a more compact and elastic way, IT allows the organization to turn data into decisions, scale to any challenge, and attain agility in both public and private clouds. With SAS for Containers, you get:
 - Data locality: Many data sources are being migrated or accumulated in cloud platforms. It is becoming a best practice to locate data and analytics processing as close to the data as possible.
 - Flexibility: Both IT and business organizations are looking at more ways to instantiate methods and tools to solve analytical challenges. This includes embracing both open source and commercial container solutions.
 - Scalability: Containers start and stop significantly faster than traditional virtual machines and use fewer OS resources. This allows IT or data scientists to instantiate multiple instances of SAS, either the SAS 9.4 engine or SAS® Viya®, to meet the wide variety and scale of computing demand.
 - Agility: Data scientists can use containers to gain access to preconfigured environments, upgrade to new releases, promote through dev/test/prod standards, and easily manage code and application versioning.

4.2.25 Innovations for Medicaid Business Priorities

Identify any innovations in your Medicaid Enterprise solution for addressing Medicaid Business Priorities (cost savings, performance efficiencies, improved care outcomes, etc.).

¹ IDC FutureScape: Worldwide National Government 2022 Predictions

² IDC FutureScape: Worldwide National Government 2022 Predictions

³ IDC FutureScape: Worldwide National Government 2022 Predictions

SAS' long history of expertise in analytics as well as our continual investment in new technology and advancements enables us to provide our customers with extensive tools, capabilities, and services that address top business priorities such as cost savings, performance efficiencies, and improved care outcomes. Innovation is at the heart of what we do. From R&D, to IT, to project management and professional services, SAS has created a culture that fosters, values and rewards new approaches to existing challenges. Our award-winning workplace culture has long been recognized, not only as an incubator for innovation in product, but as an innovative approach to training, recruiting, and retaining analytic talent. That innovative spirit visible throughout our solution, including the following features:

- ◆ **Data Agnostic Tools:** One of government's largest pain points is the inability to combine and use disparate data sources. Digital transformation, including government's cloud journey, is only amplifying this struggle. BMS should ensure its analytic tools are data agnostic and can easily ingest data in nearly any format. The SAS Solution has numerous out-of-the-box connectors for Application Program Interfaces to communicate with operating systems and microservices, which are critical to supporting care management and coordination efforts that address whole person care.
- ◆ **Single Platform for Advanced Analytics:** Using a single, integrated platform will help BMS avoid the laborious effort of integrating and maintaining multiple tools to integrate, analyze, and visualize their data. The SAS Solution is a data management, analytic, and AI/ML platform designed to offer seamless data integration, data preparation, reporting, and analytics capabilities enabling everyone—data scientists, business analysts, developers, and executives alike to collaborate and realize innovative results faster.
- ◆ **Powerful Artificial Intelligence/Machine Learning (AI/ML) Capabilities:** The SAS solution is built to make powerful AI/ML algorithms available, accessible, and relevant to the needs of forward-thinking Medicaid agencies. Using our tools, BMS will have access to the most comprehensive set of modern statistical, machine learning, deep learning, and text analytic algorithms to accomplish things like simulating the costs of a policy change, forecasting shifts in enrollment and utilization, and predicting the risk of an opioid overdose. Moreover, our AI/ML models include out-of-the-box capabilities around data/model lineage, bias assessment and monitoring, and plain language interpretability so that BMS can have confidence they are getting fair and responsible results.
- ◆ **Expanding Use of Visual Text Analytics:** Medicaid agencies are increasingly seeing the value in leveraging data that was previously locked away in unstructured text. The SAS solution has the capability to parse data into words and phrases, extract relationships between text, analyze sentiment, and visualize insights. This can be especially helpful for identifying key insights from LTSS-based assessments, identifying trends in caseworker notes, and analyzing notes in clinical records.

4.2.26 Technical Risk Management Innovations

Identify any innovations in your Medicaid Enterprise solution for addressing technical risk management.

Fragmented, rigid systems are expensive, produce inconsistent results and disrupt business. The SAS solution balances costs and agility with a fully integrated cloud-native platform that will enable BMS to insulate from technical risks, accelerate your mission-critical goals and protect your investment for years to come. While other vendors will spend time and effort integrating and managing disparate applications for data management, data quality, governance, metadata management, decision support and analytics, SAS will go right to work delivering value on our innovative prebuilt platform. Our cloud-native capabilities, combined with a single unified SAS solution, provides protection from common technical risks, such as

performance, capacity, outages, and usability, that affect the level of performance of your investment or lead to project delays or failure.

It is no secret that technology changes at alarming rates which is a key factor in technical risk management. To mitigate this risk, SAS supports the Continuous Integration / Continuous Delivery (CI/CD) methodology, which replaces the concept of versioning with the concept of aligned releases. CI/CD is a paradigm where improvements to software are pushed, tested, validated, and deployed to production in a continuous automated manner. Because SAS is continuously integrating and delivering new features, updates and downtime are minimal, and BMS gets the latest innovations the moment they are ready. Furthermore, BMS will not have to worry about how major releases, patches, and backwards compatibility impact the different components of the solution because it is one SAS solution.

Lastly, how a vendor manages the quality of their solution will impact technical risk. SAS quality management focuses on verifying that the solution satisfies the evaluation criteria agreed upon by the client and the project team and finding and correcting any defects in our software products. We apply proven continuous quality improvement principles to both system development and client data quality activities. At SAS, our quality management methods emphasize proactive quality assessment and align project expectations, internal design evaluation, and signoffs. We measure our performance against your expectations and continually refine our performance. Additionally, SAS is accustomed to blending component/module test plans on enterprise initiatives. Our proactive approach extends to other modules as needed to support the performance the entire solution.

4.2.27 Innovation Use Cases

Describe 1 to 3 use cases where innovations in your Medicaid Enterprise solution would apply and the value your Medicaid Enterprise solution would add when applied to them.

The SAS Solution provides BMS stakeholders, both technical and non-technical users, with advanced analytic tools, as well as out-of-the-box reports, to explore and visualize key trends affecting Medicaid operations and member outcomes. Use of these tools will improve BMS' ability for evidence-based decisioning such as easily identifying key drivers of utilization, pinpointing potential gaps in care and monitoring improvements in population health.

As examples, SAS can provide BMS with data-driven insights to advance health goals within specific policy priorities:

- ◆ **Whole Person Care:** Understanding a person and community's holistic health and social needs is critical to achieving whole person care, advancing better outcomes, and avoiding costs. The SAS solution provides state-of-the-art methodologies and analytical tools for risk-based analysis utilizing both out of the box models and individualized model development. These data enrichment features, such as risk stratification, enables BMS to measure, group and predict health risk and member engagement based on a variety of health and socio-economic factors (e.g., lack of stable housing and poor management of chronic disease). Using the Solutions' robust data integration capabilities, BMS can identify and analyze the complex relationship between social, health and economic factors to understand treatment adherence and access barriers. These insights will help BMS gain a more holistic understanding of members' needs and identify factors that undermine improvements in outcomes, such as preexisting social vulnerabilities. As social determinant data becomes increasingly available, models can be configured to predict utilization and support continuous quality improvement.

- ◆ **Opioids:** The opioid crisis is multi-faceted, complex, and ever evolving. We applaud BMS' approach for leveraging data to gain a more holistic understanding of its members' needs, how they interact with services across the care continuum and pinpoint gaps in care for improved policy decisions. SAS has partnered with government health agencies for improvements in both access and utility of their opioid-related data to design evidenced-based interventions and evaluate outcomes. Leveraging the Solution's pre-built statistical algorithms and intuitive visualizations, BMS will gain improved situational awareness into members at risk for opioid misuse, pinpoint providers with risky prescribing patterns and evaluate impact of evidence-based interventions across the care continuum to assess where changes might be needed.
- ◆ **Access to Home & Community Based Services:** The pandemic solidified the importance of states' investments in strengthening the infrastructure and services necessary to provide community-based care for our most vulnerable populations. Data analytics is key to successfully modernizing home and community-based services to serve more unduplicated clients. BMS has access to valuable information across claims, encounter, enrollment, eligibility, and assessments. Through the solution's robust data integration capabilities, BMS will gain improved situational awareness into geographic/community variation in utilization and enrollment, understand the demographics of people who are eligible for services today and may shift between waivers (i.e., churn), quantify actual demand for future program planning and redesign waiver services to align with clients' needs. Additionally, unstructured data continues to grow in importance as we think beyond eligibility to design models of care that evolve clinical needs. SAS has experience working with unstructured data to pull out key factors that contribute to high-risk events (i.e., institutionalization) or disparities that impact access. With these insights, BMS can modernize its Home & Community Based Services (HCBS) infrastructure and support to ensure community-based care is equitable and accessible.

4.2.28 Higher Value Outcomes

In the states where you have implemented, what have been some of the higher value outcomes? What performance metrics were you able to provide to substantiate this success?

SAS solutions have been implemented for over 83,000 customers in all 50 states. Some examples include successfully implementing the enterprise data warehouse (EDW) module for South Carolina Department of Health and Human Services, an in-process implementation of the EDW for the Wisconsin Department of Health Services, and dozens of reporting and analytic solutions for government payers and public health. Through these successful implementations, the SAS Solution provides reusable components and technologies that offers Medicaid agencies quick-time-to-value for data-driven insights and business process improvements, as well as offer the flexibility to adapt to unique state policies, standards, and business requirements. Some examples of outcomes achieved within existing EDW, reporting & analytics and Program Integrity implementations include:

South Carolina

- ◆ South Carolina's Business Intelligence System was implemented on time, on budget, and the first MES modular implementation to receive CMS certification.
- ◆ CMS publicly acknowledged the quality and timeliness of South Carolina's T-MSIS submissions.
- ◆ The SAS team includes health policy and clinical SMEs work closely with South Carolina's users to create dozens of reports and dashboards aligned with reporting and analysis

needs (e.g. behavioral health acute services dashboard to longitudinally monitor outcomes and pinpoint gaps in care).

- ◆ SC state staff recently credited SAS' performance for a positive ROI of 19:1.

Other Examples:

- ◆ SAS has extensive experience building analytically driven reports off a state's T-MSIS, an often-underutilized data asset for policy and programmatic decisioning. SAS successfully delivered a State's Medicaid leadership team a suite of utilization and outcomes-based dashboard to monitor key trends within three months of project initiation (e.g., joined homeless indicators from HMIS with T-MSIS member information to create indicator of homelessness filter).
- ◆ With the help of SAS' integrated data platform and entity resolution, Riverside County, California and Riverside University Health System (RUHS) achieved confidence in their data analysis and reporting which enables them to better serve their clients and maximize reimbursement for services. For instance, RUHS staff no longer rely on manual excel spreadsheets to identify a client across programs as SAS enabled them to pull this information electronically, verify a person's identity across programs, and identify specific variables to map care pathways to health outcomes. This improvement in care coordination has led to better outcomes for vulnerable populations

4.2.29 Legacy System Management and Lessons Learned

Discuss any experiences you have had integrating your Medicaid Enterprise solution with legacy system management and lessons you have learned for implementing new Medicaid Enterprise solutions. Do you recommend any specific approach for modifying, interfacing with, and managing the legacy system while implementing a new Medicaid Enterprise solution?

As a leader in Enterprise Data Warehousing (EDW), reporting and analytics solutions, SAS understands the complexity and challenges of integrating a modern Medicaid Enterprise solution with legacy system management. SAS recommends utilizing standard transaction formats and APIs (X12, FHIR, etc.) wherever possible to avoid customized interfaces that require development on the source and target side and can be costly to build and maintain. All interfaces should be based on open standards and not utilize proprietary methods. The solution should facilitate interface design between modules and implement interfaces that adhere to set standards and can easily adapt to changes with backward and forward compatibility. SAS incorporates built-in APIs, transactions, and models for the typical Medicaid Enterprise solution and healthcare data exchanges—that is an accelerator that you should expect from any vendor.

At SAS, we find that successful integrations set clear expectations and capture appropriate documentation on interfaces, but impose little to no change on the legacy system. Adapting the legacy system to the needs of an EDW solution adds unwanted risk without adding value as these types of requests are not fundamental to a legacy system's business operations. SAS' experience dictates that the Medicaid Enterprise solution should be flexible, support both legacy and modernized systems and provide a framework for interoperability, such as an Enterprise Service Bus, Enterprise Application Integration processes, Source to Target Mapping/Translation, Web Services, APIs, and Secure Data Transfer Protocols. The solution should include integrations and communication protocols from batch processing flows to real time messages that can handle both synchronous and asynchronous communications. It is critical to avoid a solution that handles "modern" methods only. BMS will want to avoid unnecessary work that provides no business value. For example, forcing a batch weekly claims payment cycle to send data over an Enterprise Service Bus because that is the new

technology provides no business value—it does not make claims information real time and adds a pass through that introduces a potential failure point.

4.2.30 Staffing Level Recommendation

What staffing levels, including experience and skillset, are typically required to implement your Medicaid Enterprise solution? What are the suggested state Medicaid agency staffing levels to support DDI and ongoing operations? How do these staffing requirements compare to other offerings in your Medicaid Enterprise solution?

Staffing levels depend on the solution being implemented and requirements of the state regarding ongoing support during operations and maintenance. SAS is mostly focused on three main modules: Enterprise Data Warehouse, Program Integrity and Data Analytics and Reporting. During DDI there are roles common to each solution; however, the allocation of resources may vary significantly.

SAS recommends BMS identify only the minimum key resources in RFPs so that the state can minimize cost while fully realizing the benefits of SAS' highly efficient implementation approach, described in question 4.2.31. Key roles typically require more expertise and cost. In addition to a small number of key named staff, your requirements for their qualifications should meet industry standards but not include specialized certifications, unnecessary personal or professional references or experience beyond the norm. Additionally, excessive onsite requirements will increase cost to BMS. SAS has experienced immense success working remotely with clients and having onsite meetings as needed. The onsite meetings are typically heavier at the beginning of implementation and then may increase again during testing.

Below is a sample of key roles for implementation and ongoing operations:

DDI

- ◆ Engagement Manager
- ◆ Project Manager
- ◆ Business Analyst
- ◆ DDI Manager
- ◆ Technical Manager
- ◆ Data Analytics and Reporting Manager
- ◆ Testing Manager
- ◆ Training/Knowledge Transfer Manager
- ◆ Certification Manager

Operations and Maintenance

- ◆ Engagement Manager
- ◆ Operations Manager
- ◆ Project Manager

State Medicaid agency staffing levels to support DDI and ongoing operations will be dependent on final requirements, but is typically limited to the following types of roles:

- ◆ Project Manager
- ◆ Lead Business Analyst
- ◆ Data Steward
- ◆ Subject Matter Experts

◆ User Acceptance Testing Lead

These staffing recommendations would apply for most modules within the Medicaid Enterprise solution.

Finally, states vary in their approach to staffing references. Today, job experience is easily confirmed by various internet websites if needed. While well intentioned, asking for three personal references of proposed staff is a waste of vendor time and state review efforts. A trusted vendor always wants to put their best foot forward when it comes to key staff. Trusting them to propose well qualified staff will save considerable time for all parties involved.

4.2.31 SDLC Approach

Describe the System Development Lifecycle (SDLC) approach that you use for implementing your Medicaid Enterprise solution. Can your SDLC approach be incorporated into an environment that uses a traditional "waterfall" SDLC approach? What about "agile" methodologies to support the implementation of your Medicaid Enterprise solution? If so, how can this be accomplished?

SAS uses our patented Analytic Delivery Approach, which could be described as an Iterative Waterfall method to manage solution implementation. This approach combines the benefits of both Waterfall and Agile methodologies and enables our teams to deliver multiple components/sub-modules in paralleled work streams and provide value quickly. Each time our team iterates through results with the State and your stakeholders, it is an opportunity to capture additional nuances in requirements. The goal of each analytic iteration is to maximize analytic findings. Artifacts created during analytic iterations (prototypes, data preparation, design artifacts, requirement updates) are fed into a more structured work stream that includes typical design, deployment, testing, and release tasks.

SAS' phased and iterative approach for requirements elaboration, system design, development, quality assurance, User Acceptance Testing (UAT) and implementation for each system component generates both immediate results and long term, sustainable success.

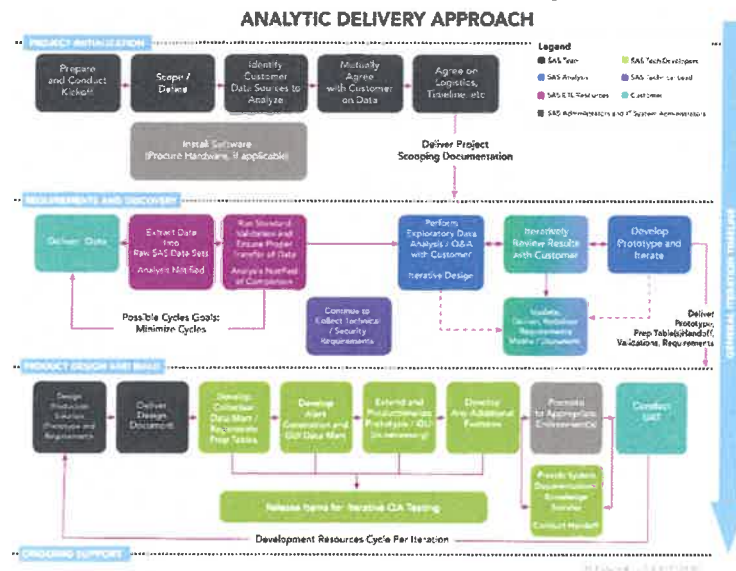


Figure 3. BMS will benefit from SAS' patented Analytic Delivery Approach.

4.2.32 Project Duration

What is the typical duration of a project to implement your Medicaid Enterprise solution? How does this timeline break down across the planning and DDI phases?

Implementation duration will depend on the specific requirements of the State, data availability, and vendor engagement. As stated earlier, SAS' typical Medicaid Enterprise solution is primarily focused on three main modules: Enterprise Data Warehouse, Program Integrity, and Data Analytics and Reporting. Depending on the module(s) selected and State requirements, the implementation timelines will vary.

SAS strongly emphasizes the importance of clear requirements and planning time for a successful implementation. Typically, SAS would use 2-6 months for planning, which is key in delivering overall project success. Using SAS' patented Analytic Delivery Approach, Figure 3 above, our goal is to provide an early time to value by prioritizing key requirements to deliver a solution which meets the needs of the State and sets the stage for further analytic development, additional data source intake, and the ability to expand data modules into other analytic solutions. By allocating sufficient planning time to prioritize requirements and strategize a delivery model, SAS is able to provide the solution in an iterative manner to ensure value is delivered throughout the lifecycle of the project. In other engagements, SAS has delivered value to the customer within the first six months through early planning and the delivery of accurate base data sets.

Including planning time, optimal duration for an initial implementation is 18-24 months, including a suite of pre-defined reports and some ad-hoc functionality. A follow up 12-month period is also recommended to create efficiency and address additional reporting and data needs. As described above, SAS strives to deliver value earlier than this timeframe through an iterative delivery approach.

4.2.33 Cost Drivers for MES Solution

What do you see as the key cost drivers for implementing your Medicaid Enterprise solution? What recommendations do you have for managing MES costs and demonstrating outcomes that mitigate any unnecessary costs of a Medicaid Enterprise solution?

The largest driver that impacts costs are state mandatory requirements for key staff. The greater the staffing requirements the greater the cost impact. Recently a state mandated 17 key staff to be named with specific qualifications for each of the positions. However, SAS' experience with the state specific qualifications that were mandated, increased the staffing costs by 60% beyond what was needed for a project of that size.

Additional requirements that impact vendor costs are mandating specific hardware and software configurations for the project. When considering that it might take up to twelve months after an RFP is released – due to evaluation of the proposals, state and vendor contracting, CMS contract approvals etc. – to start DDI within the twelve months, significant changes might have transpired within the vendor community that could reduce costs or increase efficiencies, but the vendors would be burdened with including outdated technologies. It is more prudent for a state to identify minimum architecture requirements and enable to vendors to surpass those requirements.

4.2.34 Phasing In Guidelines

Using your Medicaid Enterprise solution as an example, what guidelines do you recommend for "phasing in" your modules and/or services? How do these guidelines maximize efficiency and/or minimize risk? What constraints would they place on DDI partners and BMS?

Phasing in modules and the sequence of such phases is important across many levels as availability of data, module dependencies, staff/resource constraints (both vendors and state), costs, and others can be negatively impacted if not managed appropriately. The SAS solution for EDW, DSS/DAR, and Program Integrity makes that phasing much more seamless and reduces risk as our solution is built on a single unified platform. However, our platform can also be configured alongside or on top of other modules if so desired. Some guidelines we recommend around phasing of modules include:

- ◆ Avoid parallel implementations of both MMIS and EDW modules. Project schedule constraints, availability of data, and other factors will considerably hinder on-budget, on-schedule delivery of modules. Furthermore, the time demands on BMS staff will be overwhelming with a parallel implementation of these modules.
- ◆ Have a roadmap established for the modernization of MES modules, including the "as-is" environment to desired "to-be" state, and sequence procurements and implementations in alignment with roadmap.
- ◆ Consider beginning with the EDW, DSS/DAR, and Program Integrity modules in the initial sequence of procurements. Each module can be independent as many states (e.g., Wisconsin, Hawaii) have taken such strategy to reduce risk, project dependencies, and resource/staff constraints on state staff. Having the EDW, DSS/DAR, and Program Integrity modules implemented first can bring early value and impact to the Medicaid program through advanced analytics, fraud detection, and business intelligence to the several units within the agency. Generating value early helps BMS to justify additional investment in Medicaid IT from the Legislature and the State Budget Office.
- ◆ Systems Integrator and PMO procurements should also happen early on, and before other modules (e.g., Eligibility, PBMS, TPL, MMIS, etc.) are procured as those modules will directly interface with other modules. SI and PMO vendors can help facilitate and achieve the desired end state of the "to-be" architecture, working and coordinating with the other vendors.

4.2.35 Optimum Duration and Minimum Duration for DDI

What do you believe would be the optimum duration and the minimum duration for DDI of your Medicaid Enterprise solution?

As referenced in 4.2.32, typical durations vary based on the module selected and the State requirements. Optimal duration for an initial implementation is 18-24 months with a follow up 12-month period to create efficiency and address additional reporting and data needs. However, SAS' delivery approach focuses on providing the Medicaid Enterprise solution in an iterative manner to ensure value is delivered throughout the lifecycle of the project.

Although we strive to deliver value early, much of the implementation hinges on data availability and vendor engagement. Depending on the availability of the data sets, SAS would work collaboratively with the State to identify early value wins both pre and post initial go live. In other engagements, early and accurate delivery of the base datasets has enabled SAS to deliver value to our customers within the first six months.

4.2.36 MES Documentation

List and describe the documentation developed by your company and/or the state Medicaid agency that is essential to DDI and operations of your Medicaid Enterprise solution.

SAS provides COTS solutions that have been developed and enhanced over the past 45 years. The maturity of SAS solutions and delivery approach has allowed SAS to refine our deliverables with an eye towards fulfilling CMS Certification requirements while remaining as efficient as possible. SAS has created a robust Medicaid Project Management template library as a starting point for most required deliverables. This library includes many non-PM deliverables and Certification-focused templates as well.

SAS adapts our project management templates to client standards and modifies our deliverables to accommodate state specific requirements. Following are the typical PM Deliverables recommended by SAS:

- ◆ Project Charter
- ◆ Communication Plan
- ◆ Risk and Issue Management Plan
- ◆ Quality Management Plan
- ◆ Change Management Plan
- ◆ Project Schedule
- ◆ Requirements Matrix
- ◆ Implementation Plan

SAS recommends the following non-PM deliverables:

- ◆ Testing Plan
- ◆ Certification Management Plan
- ◆ Detailed System Design
- ◆ Security and Privacy Management Plan
- ◆ Disaster Recovery/Business Continuity/Cyber Incidence Response Plan
- ◆ Operating Procedures Guide
- ◆ Annual Business Plan

Additionally, SAS has created the following Outcomes-Based CMS Certification deliverables:

- ◆ Defect reporting
- ◆ Testing reporting (Unit testing, QA and UAT)
- ◆ Production Release notes

With every engagement, SAS uses lessons learned to continue to create and refine our deliverables and templates.

4.2.37 Confidence in Health Data

Detail how your Medicaid Enterprise solution could support BMS in improving data analytics and reporting capabilities, data sharing initiatives, and overall confidence in health data.

The SAS solution will support BMS in improving data analytics and reporting capabilities by democratizing data and analytics and delivering it with extraordinary performance so that everyone can make faster, better decisions. SAS' scalable cloud platform integrates disparate technologies, skills, and processes with end-to-end capabilities powered by automated AI to help advance BMS's data sharing initiatives. And with the SAS solution, BMS will be able to

make transparent and explainable decisions to build trust for the long-term and improve overall confidence in health data.

Data Analytics and Reporting Capabilities

The SAS platform provides a unified, scalable, in-memory engine along with an easy-to-use interface. The combination of interactive data exploration, dashboards, reporting, and analytics empowers business users to discover valuable insights without coding or the need for advanced data scientist skills. Users can examine and understand patterns, trends, and relationships in data with a complete spectrum of analytic and reporting features.

Users of all skill levels can visually explore data, use automated analysis, and create visualizations while tapping into massively parallel processing (MPP), in-database processing, and powerful in-memory technologies for faster computations and discoveries. In fact, most queries run in less than one second. SAS differentiates itself from other solutions on the market through heavy utilization of in-memory analytics, which represents an important paradigm shift in how organizations use data to tackle a variety of business challenges. With in-memory analytics, rather than accessing the data on a disk or in a database, data remains suspended in the memory of a powerful cluster of computers. Multiple users can share this data across multiple applications rapidly, securely, and concurrently. The bottom line—BMS users will spend less time waiting for insights and more time acting on them.

The SAS solution delivers advanced tools that offer artificial intelligence (AI) and machine learning (ML) capabilities, such as predictive modeling and forecasting as part of SAS' unified platform. This ensures that users do not have to switch from one tool to another or have multiple administrators for mixed toolsets. AI and ML technologies represent the future of Medicaid analytics, as these advanced approaches are what will drive significant innovation in healthcare delivery going forward. Most importantly, SAS models embrace supervised learning techniques to ensure that when biases are identified (which happens at the start of any model or algorithms), humans can correct the biases once the results are reported.

Moreover, SAS operationalizes AI and analytics to help you act on opportunities and accelerate time to value. With SAS, BMS will have one place to

- ◆ Oversee models so you can understand performance across all applications
- ◆ Integrate with business rules so that models are built within the appropriate business context
- ◆ Monitor and manage the performance of all your analytic models for consistency across the entire portfolio

Data Sharing Initiatives

The SAS solution will advance BMS's data sharing initiatives through its microservice architecture, Sandbox offering, and flexible data publish and consumption options.

The SAS microservice architecture aligns to the CMS seven conditions and standards and allows for a modular, flexible approach to systems development across the enterprise through exposed APIs. These microservices act as baseline capabilities that can be used by anyone across the enterprise to securely share data and solve business problems. The SAS platform supports both SOAP and RESTful web service access either directly from other systems or via an enterprise service bus (ESB). Additionally, SAS' information architecture provides data standardization, standards-based interoperability, data privacy and security,

and data governance. Through this layer, data is shared via web service or data extract with those authorized to view it.

The SAS solution also provides a Sandbox, a user-oriented data area where external data can easily be landed in the solution for sharing, analytics, or reporting. Sandbox users have complete administrative control over their sandbox including the ability to import external data, create and delete tables, join to other data, and share with other user's data from their sandbox. Importing of new data sets can be done through the web-based, graphical user interface using intuitive drag and drop controls. Newly imported data is easily joined to existing data using the same interface. The sandbox gives power users developer-level access to the solution increasing their productivity and efficiency.

Lastly, SAS develops all tools with the mindset of being data and platform agnostic so that data is available and consumable to all users in their preferred setting. Users can share and export their data, reports, and finished products in a variety of standard formats such as csv, html, xlsx, pdf, and other web-based outputs. Users can easily distribute results via email, to a portal, or directly to a BMS repository. Our tools are compatible with all major operating systems and browsers. Mobile device users can use native apps for Windows 10, iOS, and Android available for free from the Microsoft Store, Apple App Store, and Google Play to quickly view dynamic reports and dashboards on tablets and smartphones.

Overall Confidence in Health Data

As data continues to proliferate and with more widespread AI and machine learning, organizations struggle to trust data, understand usage and ownership, and foster ethical adoption of AI. Poor data quality and gaps in understanding the data lead to waning user adoption. SAS offers centralized management of data quality, metadata, open source and SAS models, pipelines, data lineage and templates, giving users full visibility and control over all data and analytics activities.

A lack of checks and balances erodes trust and slows decision making. Therefore, SAS asserts a steadfast approach to and integrated features for data quality. We ensure that data balances back to the source system and the data is verified and trusted. Our data quality reporting and best practices are the best in the industry due to our analytical focus. Our automated processes verify source system validity, completeness, and reasonableness not only from an operation perspective, but specifically for healthcare analytic results. Most vendors stop their data quality measurement at the operational level. That is, counts, sums, missing fields, etc. As analytic experts, SAS evaluates the analytical quality of the data as well to ensure its sufficient for BMS stakeholders to get the actionable information they need.

SAS metadata is the single point of truth for management of reports, data sources, data models, data lineage, tables, fields, and security/access to components within the proposed solution. Through the establishment of a single source of truth for all metadata in the enterprise, the SAS solution will allow BMS to provide stakeholders with a common understanding of the architecture, business rules, attributes, and definitions. Because the metadata is centralized and governed by the data stewards, it allows for feedback to be raised to a data governance council through an organized, defined process. This commonality and feedback mechanism keeps all members of the organization aligned while engraining confidence in the data and the solution.

According to Gartner, only 53% of projects make it from AI and ML prototypes to production. With SAS' robust centralized model management features, BMS will be able to manage all analytical/AI models from one place and realize their value in production operations with transparency and governance. Models can be audited as they change hands and model definitions are visible to end users to promote trust. While new machine learning techniques, especially deep learning, might yield more accurate models, they tend to be black boxes—it is hard to know what is going on under the hood. With SAS, we pry open that black box to help explain what is going on. Our gray box models explain why the system made the choices it did which is essential for compliance with new legislation like GDPR.

In summary, SAS' intuitive analytics, visualizations and geospatial maps help everyone quickly obtain insights from data to better solve complex business problems. Powered by in-memory technology, BMS users will have answers to complex business problems at their fingertips within seconds. BMS will be able to operationalize AI and ML assets with confidence and clarity while reducing time to value. Through open API architecture and robust data publishing features, the SAS solution will be able to support BMS's data sharing initiatives. Finally, SAS' built-in governance, transparent advanced analytics, and consistent data quality will instill confidence in health data and build trust for the long-term.

4.2.38 Data Visualization Capabilities

Describe or illustrate your data visualization capabilities.

In a single unified platform, the SAS solution provides a wide array of data visualization capabilities that support descriptive, diagnostic, predictive, and prescriptive analytics to satisfy the needs of the BMS analytic community. SAS' easy to use interface enables users to quickly build compelling data visualizations using drag and drop capabilities for subsetting, stratifying, trending, and drilling down into the data within geo-maps, bar charts, line charts, heat maps, regressions, clusters, decision trees, neural networks, and dozens of other visualizations.

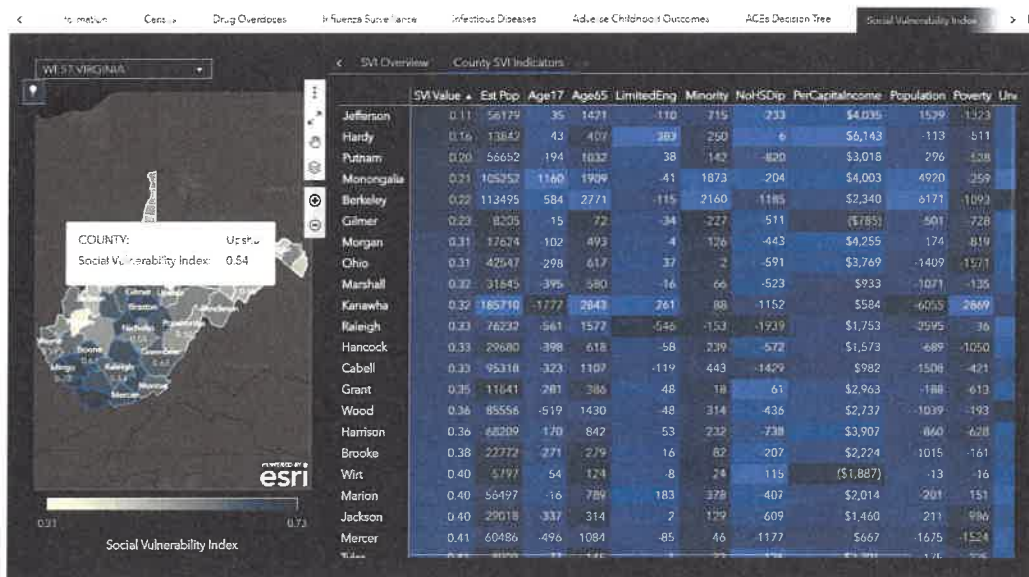


Figure 4. Easy-to-use, dynamic visualizations to monitor key trends impacting outcomes

Key value visualization allows you to display important metrics (numeric or categorical value) in an infographic style for quick reference. Path analysis (Sankey) diagrams visualize sequences of events, such as the flow of recipients through stages in eligibility determination.

The Automated analysis object determines the most important underlying factors for a specific response variable, creates a relative importance score and an exploratory plot for each predictor, and summarizes the results in a narrative fashion using natural language generation.

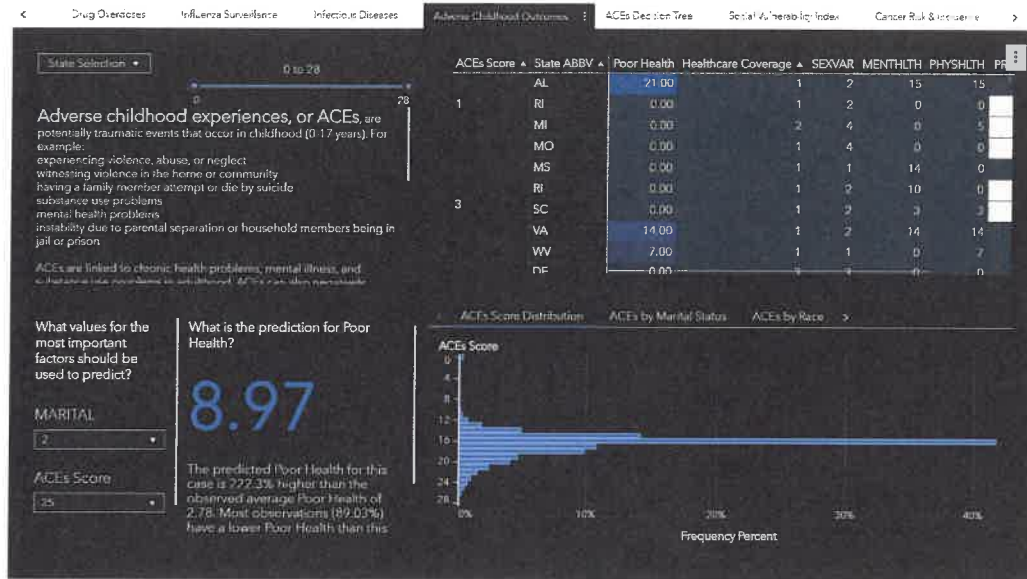


Figure 5. Automated analysis determines the most important underlying factors for a response variable and automatically summarizes the results in a narrative fashion.

The SAS programming interface also provides visualization capability enabling users to graph bar charts, line charts, pie charts, histograms, box plots, bubble plots, scatter plots, and series plots in addition to visualizations that accompany statistical analyses such as frequencies, correlation matrices, and regression fit lines.

To help users save time and discover new options for their data, the SAS solution automatically builds visualizations based on the data selected and surfaces them as suggestions to the user, which they can drag into their report and dashboard. Features such as Autocharting intuitively guide users as they build data visualizations helping them deliver the appropriate chart or graph for the data selected.

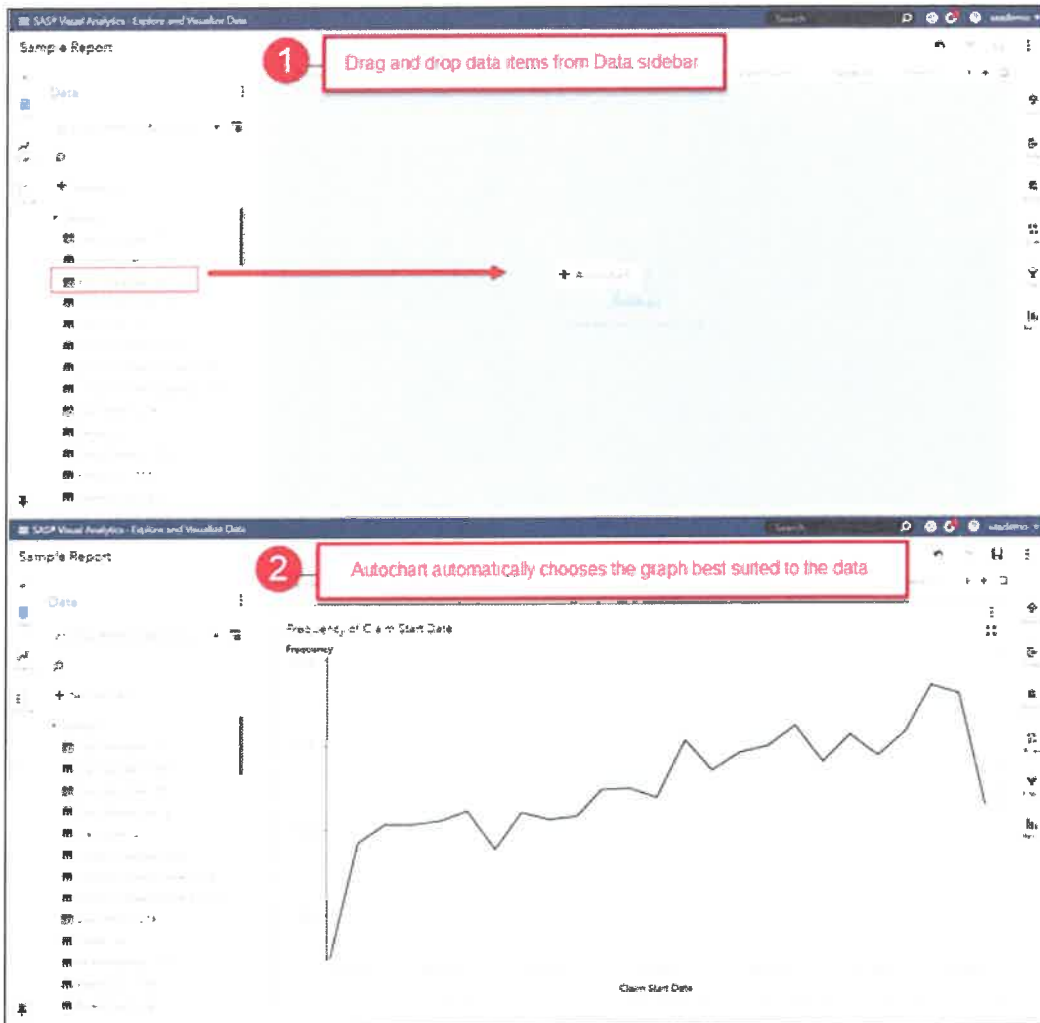


Figure 6. Autocharting automatically chooses the type of visualization best-suited to display selected data.

Additionally, SAS offers the flexibility for users to create and save their own unique visualizations. In terms of accessibility, users with visual impairments or blindness can explore data visualizations through alternative presentations of visualizations that include enhanced visual rendering, text descriptions, tabular data, and interactive sonification.

The intuitive drag-and-drop user interface allows both business and advanced analytic users to explore their data visually, determine why something happened, and identify critical drivers to make better decisions without having to go to a technical consultant.

4.2.39 Improve Coordination of Care

How does your Medicaid Enterprise solution improve the coordination of care, detect and prevent fraud, waste, and abuse to support Medicaid program integrity, and improve stakeholder access to state Medicaid Enterprise data?

SAS offers the marketplace an single platform, integrated solution that synthesises disparate data sets to provide a holistic view of members, providers, and the Medicaid program. Three key benefits of our approach include the enhancement of care coordination, robust fraud,

waste, and abuse capabilities, and improved access to crucial data assets for improved outcomes.

Clinical Analytics for Care Coordination

SAS has worked with multiple clients to improve the coordination of care across their membership. By consolidating data across multiple sources, SAS can identify population cohorts that can improve care. Our unified view of health incorporates social determinants of health data for a complete picture of drivers of health for specific groups. We have worked across governmental organizations to deliver whole person care solutions that improve patient/member outcomes while reducing costs for governmental payers.

Uncoordinated care is expensive and results in sub-optimal outcomes. SAS combines disparate data (health & non-health data) with state-of-the-art visualizations and sophisticated analytics to calculate patient/member risk. This calculation of risk is the initial step in delivering proactive interventions that improve member outcomes. Characteristics and utilization patterns of vulnerable members are identified through individualized risk profiles. These profiles, both at the system level and the individual level, enable targeted interventions to better support care delivery while improving outcomes.

Our technology and approach enable states to develop disease registries while proactively facilitating disease management and health coaching. Our solution can provide real-time alerts for care coordinators to better impact the delivery of health services. These actionable insights impact lives and improve program performance. Specifically, the aggregation of individual risk profiles along with analytics provides the foundation for understanding population needs. This approach informs policy makers with key insights to for coverage and pricing. By connecting individual risk profiles to populations, the consolidated data within the SAS solution can strengthen BMS programs while enhancing services to your members.

Innovative Enterprise-wide Approach to Fraud

Our one, integrated software solution fully supports the detection of fraud, waste, and abuse in Medicaid claims – both fee-for-service claims and managed care encounters. Importantly, the solution goes beyond just detecting suspicious providers and claims. The SAS solution supports the day-to-day work of your program integrity staff – allowing fraud case management, recoupment of overpayments, and coordinating fraud-fighting efforts with MCO Special Investigation Units (SIU's) and the WV Medicaid Fraud Control Unit (MFCU).

Spotting fraud early and moving aggressively to deal with it requires an enterprise-wide fraud strategy. An enterprise approach is characterized by the fact that it:

- ◆ Eliminates data silos and provides a holistic view of data across programmatic and departmental boundaries.
- ◆ Helps coordinate fraud detection and interdiction efforts across all agency programs and departments.
- ◆ Uses analytics to detect and generate fraud alerts at the enterprise level so that anti-fraud efforts can be prioritized based on the overall egregiousness and value at risk for each entity being investigated.
- ◆ Focuses on eliminating fraud by preventing payments as opposed to paying for services which generates payments that are then difficult to recoup for financial restitution.

The SAS solution improves your current fraud detection capabilities by using a hybrid analytics approach. What does this mean? Traditional fraud detection systems use reports and queries to search for a specific “bad” behavior by providers. SAS takes a different approach. Instead, we execute over 1,400 fraud models and rules concurrently – searching for all types of known “bad” behaviors. Then, we summarize all the model outputs into a single score for every provider in the Medicaid program. That summarized score allows your investigators to find providers who are the most suspicious across all kinds of fraud schemes. However, you also retain the ability to search and sort on a specific fraud scheme that requires special attention by your Program Integrity team.

The solution’s fraud analytics engine uses multiple techniques (i.e., statistical identification, automated business rules, outlier analysis, predictive modeling/Multivariate Anomaly detection, text mining, multi-field crossmatches, network link analysis, etc.) to uncover the likelihood of FWA and other improper payments that cause loss and compromise program integrity.

Our experience tells us that to successfully fight FWA, high-quality alerts identifying overutilization and quality of care issues are essential. This is the heart of operationalizing fraud analytics: high-quality alerts, strong visualizations, ease of access to key data, and the ability to disposition, track, and report the related work processes using automation

Improving Access to Data through Analytics

The BMS MES system needs to be user friendly and have the ability for ad hoc reporting. BMS is also interested in learning more about advanced technologies that can look seamlessly across systems in order to spot inefficiencies, eligibility concerns, outliers, or potential fraud, waste, and abuse, and provide meaningful insights to include actual case studies. These meaningful insights may include identifying variations in professional practices across facilities, providers, or regions or the impact of certain prior policy decisions or proposed policy decisions on Medicaid program costs. The system also has a number of significant goals to achieve such as, but not limited to:

1. **There was a belief years ago that by shifting Medicaid recipients into Managed Care Organizations (MCOs) that those organizations would be more capable of preventing FWA activities.** Unfortunately, fraud in MCO claims remains rampant because many of the MCOs have limited resources to focus on FWA which might have led BMS to create this RFI. SAS tools have been used across a number of MCOs with great success wherever SAS, the States and the MCOs closely team together to focus on preventing and eliminating fraud. **With respect to existing MCOs in WV, SAS has worked with WV Healthy Families, AmeriHealth Caritas, and Well Sense Plan directly so we understand the difficulties they face when fighting FWA.** The types and nature of alerts and FWA reports would need to be specifically developed for WV as each state identifies different programs and services for managed care. This potentially includes value-based payment models. Further data exploration would capture anomalous data and behaviors that may be related to unscrupulous MCO practices such as lemon dropping, patient diversions, etc. Most states have not reached this level of sophistication in FWA analytics. Yet, the SAS Solution is fully capable of handling these types of efforts because the solution is an end-to-end analytics platform. Our data scientists and subject matter experts can help if BMS determines to explore this analytics path.
2. **The breadth and flexibility of the SAS Solution enables States to integrate massive amounts of different data types for analytics purposes.** These different data sets enable the power of SAS to be applied to discover activities that might have been missed due to

siloeing of data. Most importantly, through SAS' Artificial Intelligence (AI) and Machine Learning (ML), processes that were once manual and cumbersome can now be significantly automated to enable staff to focus on the highest probability returns on identifying FWA within the Medicaid system regardless of whether the activities are taking place in MCOs or Fee-For-Service claims. **To confirm the extensiveness of SAS, in one State, we combine data across 28 disparate agencies with over 305 data feeds. It is the most sophisticated state enterprise-wide data analytics system in the country.** The purpose – while not merely focused on program integrity and fraud – was specifically designed to enable interagency coordination for benefits and services. Because of that experience, we were elated by WV State's similar vision.

3. **SAS' drag and drop technology enables customizable reports**, predictive modeling and forecasting integrated with mapping capabilities provided by ESRI ArcGIS. Our training program focused on the SAS 1,400+ FWA specific configurable algorithms right out of the box, enables staff to run models on Day 1 and by Day 5, staff are knowledgeable to deliver sophisticated forecasting and predictive models. **All of these pieces can be accessed through one single platform and includes users who desire open source tools such as R, Python or Lua.** The users can either code in open source and hit a one-button translator key to convert to SAS or create their models in SAS and translate to open source code if desired. There are no restrictions since SAS is structured to accommodate nearly all user preferences.
4. SAS believes that no matter how strong a solution is, if the program does not deliver objective, **measured KPI and ROI results**, value is always questioned. We work closely with our clients to ensure that what we measure and report will be of value to the Executive and Legislative branches of the States.
5. For most state staff executives, they are not interested in actually creating their own dashboards but rather having simple reports readily available in order to respond to legislative, executives or media inquiries. **The SAS Solution incorporates AI, ML and geospatial analysis that too can be displayed on an easy to configure dashboard and allows for predictive modeling, and forecasting in the single system.** SAS has the ability to produce these dashboard reports within the SAS system or integrate with dashboard tools such as Tableau. While there are a number of other COTS products that can create nice visuals, these dashboards are usually populated with simple, static reporting content and their drill down capability is limited. The SAS difference makes investigations much more precise to prevent or eliminate FWA.
6. **SAS delivered the nation's newest CMS certified Medicaid EDW which includes Program Integrity and was implemented by SAS on time and on budget for South Carolina.** This state-of-the-art system was certified in February 2020. Our implemented solution fully supports and aligns to the Medicaid Information Technology Architecture (MITA) framework, as well as the Centers for Medicare and Medicaid Services (CMS) seven conditions and standards.

4.2.40 Access and Shared Use of Data

Describe how your Medicaid Enterprise solution increases access and shared use of data with both the State and other vendors, improves healthcare quality management, and increases automation capabilities.

Increase Access

Our single technology platform solution connects people across your organization as well as vendor stakeholders to a single source of truth data store to perform data visualization, advanced analytics, and data preparation. This is done via self-service data access and will allow decision makers to explore focus areas like health care quality, preventive measures,

early intervention, and social determinants of health to evaluate and improve care for West Virginians.

As noted above, SAS uses a single platform approach, so that all system components are speaking the same native language. This approach realizes the goal of having a single, centralized metadata store that enables staff to access, create, maintain, and detect changes to metadata for the Department's applications and data stores. Through this enterprise perspective, you can avoid silos, while enabling greater access to the single point of truth for BMS data.

Our implemented solution fully supports and aligns to the Medicaid Information Technology Architecture (MITA) framework, as well as the Centers for Medicare and Medicaid Services (CMS) seven conditions and standards. SAS has integrated disparate Medicaid data sets and brings decades of experience with data intake, cleansing, and organization to ensure all your Medicaid Enterprise Systems modules access and utilize data in an efficient manner.

Improve Health Quality

SAS has worked with our clients on defining quality, measuring quality through interrogation of data and improving the quality of care through actionable insights. SAS' platform empowers BMS to not only identify high-cost drivers such as fragmented care and inappropriate utilization of services, but also looks deeper into previously disparate data elements to develop actionable policy solutions. By integrating members' claims data with Medicaid enrollment, social determinants of health, employment, and other information, our platform provides a robust look into Medicaid membership that can be leveraged to drive quality health outcomes.

Centralized data makes for robust quality metrics including HEDIS and NCQA. Our approach enables BMS to manage, minimize and mitigate risks. By centralizing data, clients can perform robust quality metrics including HEDIS and NCQA. This approach maximizes collaboration in improving care while enhancing the flexibility to support new practices and models of care. Our single platform coupled with advanced artificial intelligence (AI) and machine-learning (ML) will enable BMS to implement risk management tools that keep members safe while improving quality of care.

Automation

SAS works to automate as much of the regular operations processes as possible. Data acquisition, ETL jobs, monitoring, and auditing reports, among others, are all automated to remove the manual element and reduce long term cost to BMS. In addition to data acquisition automation, SAS innovation and openness also allows users to execute models built in open-source applications (such as R and Python) via the single SAS platform. This integration confirms our solution can evolve to support new technology and program requirements such as new data subjects, sources, tables, and dimensions.

Along with automation, SAS solution includes artificial intelligence (AI) and machine learning (ML). AI and ML are already included within the SAS solution. AI and ML matter greatly to BMS, as these advanced approaches are what will drive significant innovation in healthcare delivery for West Virginia. AI and ML will yield innovation and ROI for healthcare organizations across the globe.

4.2.41 Improve Access to End-Users

If applicable, how does your Medicaid Enterprise solution improve access to end-users, such as a user's data or access to additional services?

The SAS solution improves access to end-users through our innovative data management approach and our modern cloud native architecture helping drive BMS towards its goals for improved data timeliness and use. SAS' self-service data management approach will enable BMS to reach throughout the health and human services enterprise and perform any number of activities, such as data import, point-and-click exploratory analysis and access to third-party systems. BMS will have the ability to link to data sources, databases, and all other types of information using a guided, graphical user interface that gives all authorized users the ability to manage data. Users will be able to quickly and easily create specific, individualized steps to address unique data transformations and analytics requirements to promote broader usability across the enterprise. Designers will be able share work with the user community thereby promoting reusability of transformations that results in consistency/repeatability, plus time and effort savings.

In previous generations of technology, rolling out these types of functions directly to business users was impractical. Those older technologies required specialized skills including programming and query writing to operate. SAS' modern technology platform is different. It will enable BMS to roll out data management capabilities directly to business users, with only occasional assistance needed from IT resources, thereby improving data timeliness, use, and accessibility. Along with our self-service data management approach, our modern cloud native architecture provides greater access to end users.

Having a solution based on a microservice architecture allows for a modular, flexible approach to systems development. Modularity should be supported across the enterprise through exposed APIs. Microservices serve as baseline capabilities that can be used by anyone across the enterprise to solve business problems. A business rules engine stores rules in both human and machine-readable formats. When offered on SAS' single platform, these definitions are natively shared across the entire solution without any additional bridges or transformations necessary that might alter the definition of critical business terms. Native communication throughout the solution is critical with data delivery as it strengthens confidence that data pulled from the solution is identical regardless of how it is delivered to the end user.

BMS and its partner agencies will benefit from enhanced user access through SAS' innovative self-service data management approach and our microservices architecture, both moving BMS towards modularity, and improved data timeliness and use.

4.2.42 Gaps in Health Outcomes

How can your Medicaid Enterprise solution help address gaps in health outcomes? Please provide outcomes from other engagements, if applicable.

The SAS solution provides state-of-the-art methodologies and analytical tools for risk-based analysis utilizing both out of the box models and individualized model development. These data enrichment features, such as risk stratification and impactability scores, will enable BMS to measure, group and predict health risk and member engagement based on a variety of health and socio-economic factors (e.g., lack of stable housing & poor management of chronic disease). Using our solution's robust data integration capabilities, BMS can identify and analyze the complex relationship between social, health and economic factors to understand

treatment adherence and access barriers. These insights will help BMS gain a more holistic understanding of members' needs and identify factors that undermine improvements in outcomes, such as preexisting social vulnerabilities. Some examples from existing implementations include:

- ◆ **Riverside County, California:** With the help of SAS' integrated data platform and entity resolution, Riverside County achieved confidence in their data analysis and reporting which enables them to better serve their clients with behavioral health diagnoses and maximize reimbursement for services. For instance, Riverside University Health System staff no longer rely on manual excel spreadsheets to identify a client across programs as SAS enabled them to pull this information electronically, verify a person's identity across programs, and identify specific variables to map care pathways to health outcomes. This improvement in care coordination has led to better outcomes for vulnerable populations.
- ◆ **South Carolina:** The Acute Services level of care has been an area of focus for oversight and quality improvement. These dashboards were developed to provide SCDHHS more complete information on length of stay, repeat admissions, and what treatment services were received following discharge from Acute Services. By monitoring readmissions to Acute Services, PRTFs, outpatient services, and other care, these dashboards can provide insights into whether Acute Services treatment was effective, and where there are opportunities for improvement and provider support and education.

4.2.43. Payment Milestones

Describe your experience with payment milestones during the DDI of your Medicaid Enterprise solution. In other DDI projects, were payments tied to deliverables, acceptance criteria, and/or other DDI milestones?

Within the MES modularity guidelines, CMS identifies that projects should contain withholds until a specific milestone is accepted. However, CMS does not mandate that 100% of the funds be withheld pending milestone acceptance. Under a 100% withhold payment plan, the vendors are then burdened with carrying all staff costs until the milestone is accepted. In order to carry costs with milestones that might take six to twelve months to complete and be accepted, the vendors must then add carrying costs into their project plans since the vendors would be effectively funding the state during the delivery period.

The most reasonable payment plan which enables vendors to not have to add additional carrying costs and yet provides an acceptance withhold is to pay the vendor for 75% of its costs on a prorated monthly basis and still withhold 25% of each milestone payment until accepted. This split in payment aligns the goals of both the state and the vendor to complete a milestone and accept the project as rapidly as possible. Delaware's CDMS RFP issued in Dec 2021 is the most recent example of a 20% withhold for milestone payment.

4.2.44 Demonstration

Do you have a short demonstration of your approach and/or Medicaid Enterprise solution that you would like to present to BMS? If so, please describe the method of presentation for the demonstration and suggestions for who should attend. If BMS wishes to take part in a demonstration, they will reach out to the Respondent for further information.

SAS desires to demonstrate our analytics functionality for predictive analytics and forecasting for BMS at its earliest convenience. Pursuant to the RFI details, BMS is interested in the quick value ROI and SAS' demonstration would include artificial intelligence (AI) and machine learning (ML) functions that provide increased efficiencies to state agencies. When combined

with our expertise in fraud waste and abuse fields of work, there are direct performance deliverables that BMS should consider for inclusion in any MES RFP.

Our preferred venue is for in person demonstrations for a period of one to two hours to allow for dialog between SAS and BMS.

Due to our experience throughout the COVID pandemic, the SAS team is also quite accomplished with delivering these demonstrations via video teleconference. Our preferred video teleconference technology is Microsoft Teams, but we can accommodate other venues just as well.

The recommended participant list should include BMS personnel from the following areas:

- ◆ **The user community.** End user participation confirms or denies the usefulness of any vendor system.
- ◆ **The information technology team.** These people can attest to system capacity to scale and confirm security compliance.
- ◆ **The RFP project team.** Personnel constructing the RFP would receive immediate direction from both the user community and the IT personnel on requirements to include in an MES procurement.

4.2.45 Additional Information about SAS MES Solution

Is there additional information you would like to share with BMS related to the topics addressed in this RFI?

SAS recommends the following best practices for your consideration during upcoming procurements:

- ◆ **Scope detail**—To have more consistency among the vendor solutions design, we recommend the state provide detailed system requirements to size the system properly (e.g., the types and numbers of reports to migrate, number of data sources to be included, and extracts to be generated, etc.).
- ◆ **Advanced analytics**—The EDW RFP should include requirements for advanced tools that offer artificial intelligence (AI) and machine learning (ML) capabilities, such as predictive modeling and forecasting as part of the system platform. This ensures state users do not have to switch from one tool to another or have multiple administrators for mixed toolsets. AI and ML technologies represent the future of Medicaid analytics, as these advanced approaches are what will drive significant innovation in healthcare delivery going forward. Most importantly, the models should embrace supervised learning techniques to ensure that when biases are identified (which happens at the start of any model or algorithms), humans can correct the biases once the results are reported.
- ◆ **Open-source considerations**—Open-source coding can have performance impacts when data volumes increase exponentially. Open-source software also has weak security. The vendor should embrace simple integration of open-source codes such as R, Python, Lua etc. and have the ability to convert this open-source code to provide the security and speed deficiencies not typically included in open-source tools.
- ◆ **Oral presentation/demonstration**—Required oral presentations should be based on demo data provided by BMS. Vendors should demonstrate the tools' capability, including advanced analytic capabilities, in a live environment.
- ◆ **Experience/qualifications**—Vendors should have at least two healthcare data warehousing and analytics projects (e.g., Medicaid, Medicare, or MCOs, etc.) within the past 5 years. A recent relevant State RFP is Wisconsin.

- ◆ **Key staffing**—The RFP should minimize the number of named key positions and should not be overly specific on the qualifications and certifications associated with the positions as experience on similar projects can be more important than education and professional certifications (e.g., the Account Manager does not need a PMP certification but instead has proven experience in previously implementing similar projects of size and scope). Requiring a long list of Key Staff drives cost and may reduce the number of responders to the detriment of choosing the most qualified vendor solution. Please see our specific recommendations within our response to 4.2.30 above.
- ◆ **Conflict of interest**—All Medicaid MCOs currently providing services in the State should be precluded (including subsidiaries/affiliates) from responding to any subsequent solicitation because of the potential conflict of interest in the evaluation of encounter data. While the argument is often made that MCOs have internal firewalls, those separations are highly suspect and provide an MCO bringing the EDW and analytics with an unfair insight into how their competitors are delivering services and at what price points --impacting MCO contract negotiations.
- ◆ **Limitation of liability**—Vendor's liability should be limited to the 1x total contract value of the procurement. This enables the state to cover any risk in a vendor failing on a contract and yet provides enough monetary coverage to replace a failing contractor. States that require unlimited liability create the unintended consequence of greatly limiting the number of bidders – resulting in less competition, less innovation, and higher price.
- ◆ **Unlimited users**—The solution should account for unlimited named users to allow the Department to expand usage of the system over its lifespan without additional charges per named user.
- ◆ **Agile / Iterative development**—We recommend a process that promotes both continuous improvement and user trust. This form of development is accomplished by iteratively refining the solution based on customer feedback and through repeated cycles of review during design. Through the iterative development cycles, Systems Integration Testing (SIT) is performed by testing teams in the Test environments before releasing the solution to the users for UAT. However, by the time users engage in a final UAT, this process enables the client to have reviewed and evaluated the functionality many times before through the iterative design cycle.
- ◆ **Continuous Integration / Continuous delivery (CI/CD)**—SAS supports the CI/CD methodology. This methodology enables the concept of versioning to disappear and be replaced by a single version with aligned releases. CI/CD is a paradigm where improvements to code are pushed, tested, validated, and deployed to production in a continuous automated manner.
- ◆ **Automated Testing**—As part of progressive artificial intelligence and machine learning practices, we recommend automated testing when and where possible to improve the efficiency and effectiveness of testing. This allows not only vendors and department staff to both complete significant testing in the most efficient manner. Automated testing involves the use of specialized software that executes pre-defined test scripts and cases without human intervention. This type of testing will record test results, produce testing statistics, and provide automatic notification to appropriate personnel of test defects.

5.2.4 SAS Corporate Overview

Corporate Overview (2 pages only)

SAS is the largest privately held software company in the world, with annual revenue of over \$3.25 billion. The heart-and-soul of SAS is data and analytics. Our mission is to deliver superior solutions that give you the power to make the right decisions.



Founded in 1976, SAS serves more than 83,000 government, university, and business sites in 147 countries. SAS solutions are used extensively by all 50 state governments, all 15 federal departments and approximately eighty-five percent (85%) of federal sub-agencies and quasi-governmental affiliates.

We are no strangers to Charleston. SAS has supported West Virginia state government as far back as 1980, when we began working with the Department of Administration. Since then, we have grown to support the WV Department of Transportation, WV State Tax Department, WV Division of Rehabilitation Services, WV Office of Maternal Child and Family Health (part of DHHR), and the WV Board of Pharmacy. We also serve as the IT backbone for the West Virginia Fusion Center – supporting dozens law enforcement agencies across the state in bringing together criminal justice data into a single, cohesive source of intelligence.

SAS software tools and solutions are behind many of the data driven decisions made across the West Virginia State agencies we serve.

Experience

SAS is more than a generic analytics vendor. We have supported Medicaid programs for decades. With the advent of modularity, SAS has quietly emerged as a leading provider of MES solutions for state Medicaid agencies. This shows the depth of our Medicaid experience in the last 20 years.

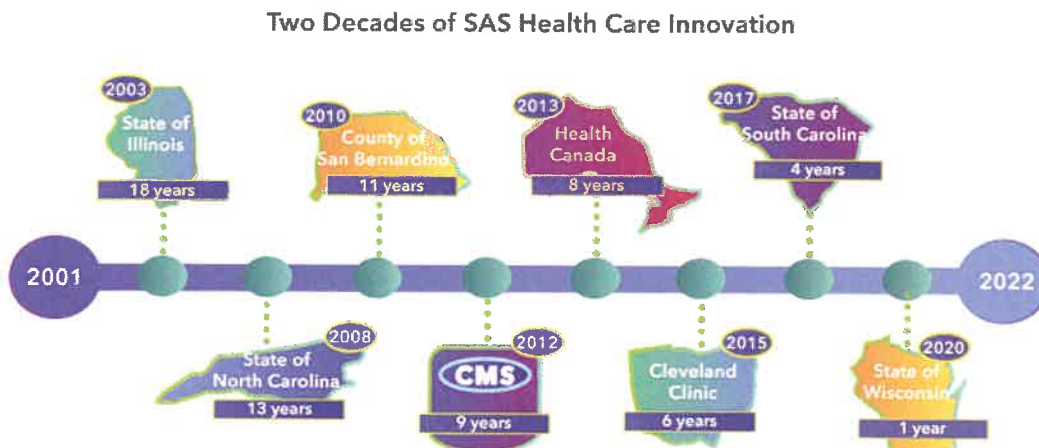


Figure 7. Breadth and depth of SAS experience in Medicaid

South Carolina Medicaid engaged SAS to deliver the Business Intelligence System (BIS) – an Enterprise Data Warehouse (EDW), analytics platform, and program integrity solution. South Carolina was the first state to receive CMS certification for this MES module. Similarly, Wisconsin Medicaid engaged SAS to deliver the Enterprise Data Warehouse (EDW)/Data

Analytics and Reporting (DAR) solution. Maryland Medicaid engaged SAS to deliver a SURS/PI module, and the Texas Medicaid Inspector General engaged SAS to build fraud detection models for the Medicaid program.

Staffing

SAS has 14,000 employees. We maintain a dedicated team that focuses on delivery and execution of MES projects. Our staff includes former state Medicaid officials – including the CIO of Arkansas Medicaid, the Program Integrity Director for Ohio Medicaid, and the CIO of New Jersey Medicaid. Collectively, our team has delivered Medicaid projects in over 25 states.

Ownership

SAS is a privately-held firm and is co-owned by Dr. James Goodnight and Dr. John Sall.

Technical Maturity

SAS offers BMS a commercial off-the-shelf (COTS) solution that supports three common MES modules:

1. Enterprise Data Warehouse (EDW) or Decision Support System (DSS)
2. Data Analytics and Reporting
3. Program Integrity

The solution provides all functionality needed in a single, integrated platform. This platform is built on a modern, cloud-native architecture. And, it has been certified by CMS in other state Medicaid agencies.

For these reasons, SAS provides BMS with a highly mature solution that can support WV for the foreseeable future.

Signed RFI Acknowledgement

On the following page, please find SAS' signed acknowledgement of this RFI.

Request for Information
CRFI BMS220000001
Medicaid Enterprise System (MES)

By signing below, I certify that I have reviewed this Request for Information in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this response for review and consideration on behalf of my organization.

SAS INSTITUTE INC.
(Company)

STEVE SACHS, SR. MANAGER
(Representative Name, Title)

T: 919-531-4231
(Contact Phone/Fax Number)

1-6-22
(Date)

*Any contract relating or resulting from this RFI shall be subject to negotiation and mutual agreement.

