2017 | 2019

MISSISSIPPI

STRATEGIC MASTER PLAN FOR INFORMATION TECHNOLOGY

Mississippi Department of Information Technology Services

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Message from the Executive Director

December 31, 2016

I am pleased to present the *2017 – 2019 State of Mississippi Strategic Master Plan for Information Technology.* The Mississippi Department of Information Technology Services (ITS) strives to provide trusted technology resources and services that offer proven value to all stakeholders in Mississippi government. To meet that objective, the development and publication of the *Strategic Master Plan* seeks to outline current strategic initiatives of ITS, in conjunction with needs of state agencies, with achievement oriented goals and strategies set to optimize information technology (IT) services for the State of Mississippi.

Today, no one disputes that state governments need to be focused on cybersecurity. Given its current trajectory, cybersecurity risk in state governments is unlikely to dissipate, and will likely grow, largely a result of the increase in innovation and use of technology and data. As outlined in the work by National Governor's Association (NGA), a robust governance structure for cybersecurity is a foundational element in the development of a common, shared framework to prepare for, respond to, and mitigate cybersecurity risks. In 2016, the NGA unveiled the Chair's Initiative, *Meet the Threat: States Confront the Cyber Challenge*, placing states at the center of finding solutions to increasingly sophisticated cyber threats.

Together, we are aware that the unauthorized disclosure, theft, loss, destruction or alteration of information would disrupt the financial stability of state government, deteriorate user confidence and limit the State's ability to continue to provide mission critical services. And, together, we must continue the work of providing concrete, strategic solutions to diminish cybersecurity risks.

On behalf of the Mississippi Department of Information Technology Services, I look forward to our continued work together in advancing the goals and strategies presented in this plan.

Sincerely,

Craig P. Orgeron, Ph.D.
Executive Director

PURPOSE AND CONTEXT

The *2017-2019 State of Mississippi Strategic Master Plan for Information Technology* is intended to assist state government's technology and business leaders in making informed technology decisions. It establishes a common set of statewide strategies and goals for the state's information technology (IT) enterprise over the next three years.

As part of the statewide IT planning process, selected goals and strategies have been updated and/or restructured, and new goals have been added to assist the Mississippi Department of Information Technology Services (ITS) in driving towards and delivering the most efficient and effective services set forth in this plan. ITS endeavors to work collaboratively with state agencies, universities, public education, and other public entities in Mississippi to focus on excellence through quality of service, responsiveness, innovation, professionalism, and teamwork. The *2017-2019 State of Mississippi Strategic Master Plan for Information Technology* should serve as a guide to government agencies in not only selecting technology that supports their existing business operations but also foster innovation into the digital transformation of government services.

The development of Mississippi's 2017-2019 goals and strategies are guided by the following technology leadership principles:

- Delivering state government business outcomes, goals and objectives supported by technology strategies that have a sound business case before new investments are made
- Maintain flexibility with accountability in order to respond to new service needs
- View IT in Mississippi government from the perspective of the entire enterprise, aggregating resources, where feasible, in order to reduce duplication, increase efficiency and effectiveness, and increase purchasing power
- Foster a culture that recognizes the need for investing in information security resources and implementing information security strategies
- Employ enterprise solutions capable of reducing the evolving threat and to protect Mississippi government's informational assets
- Recognize that IT is a statewide resource where technology investments should be aligned with strategic goals of the State
- Develop a process that fosters intergovernmental cooperation to share information easily within government organizations and with outside partners
- Employ technology that is flexible and interoperable so that changing business needs can be responded to quickly and efficiently
- Recognize that many agencies have substantial investments in existing technology, and devise strategies that leverage those investments when practical
- Develop an IT workforce with the skills required to develop, manage, and fully utilize the state's IT enterprise

The *Strategic Master Plan* does not replace the business-oriented plans of individual state agencies. As a companion planning document, it assists agencies in aligning their use of technology with the direction established for the state's IT enterprise. Technologies highlighted in this plan can be used by all state agencies regardless of their mission or complexity.

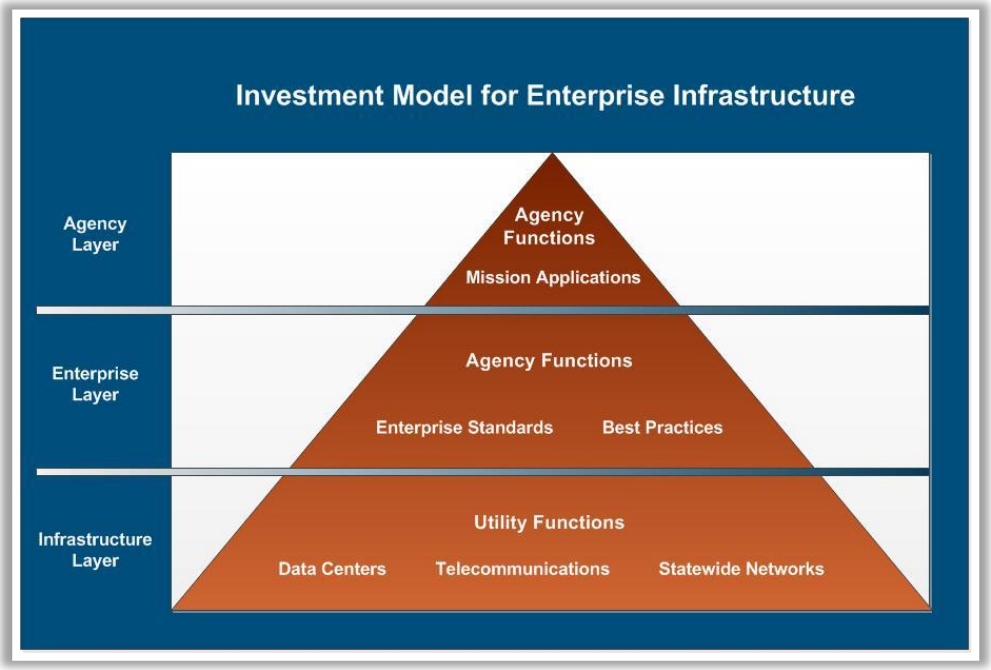
Investment Model for Enterprise Infrastructure

To ensure the effective and efficient use of public funds, ITS collaborates across state and local government agencies to effectively manage and deliver statewide IT services and technologies that are beneficial, secure, accessible, and that leverage the enterprise statewide shared infrastructure and architecture.

Complimentary to the technology leadership standards, ITS has outlined seven guiding principles for shared technology infrastructure. These principles provide the rationale for adherence, serve as starting points for difficult evaluations and decisions, and guide the design and selection of shared technology components:

- IT is an enterprise-wide resource; therefore, IT investments will be aligned with the strategic goals of the State of Mississippi through planning and enterprise architecture processes
- Statewide IT infrastructure and architecture will support Mississippi's long-term government business strategies and plans
- Statewide IT solutions that deliver products and services to stakeholders will leverage the shared technology infrastructure
- Statewide IT infrastructure and architecture will be adaptive and evolve to accommodate changes in business and technology
- Statewide IT solutions will be based upon industry standards and proven technologies that leverage the state IT infrastructure and architecture
- Statewide IT solutions will actively seek opportunities to implement common sets of shared technologies and services used across multiple agencies
- Statewide IT infrastructure and architecture will provide a reliable, secure, and highly-available network and technological infrastructure

Deployment of innovative technology solutions will expand access to information and services, equip employees with the tools needed to accomplish their jobs, and improve decision making within organizations.



Infrastructure provides a statewide framework to achieve these principles and presents a vision of a flexible and innovative shared services and technology infrastructure. The Investment Model is comprised of three layers:

- **The Statewide Infrastructure Layer** includes: Managed Service Delivery, which encompasses State Data Center services; communications technology services; ms.gov; and shared applications.
- **The Enterprise Layer** represents the areas where ITS and agencies work together to leverage Mississippi's technology investment. Another aspect of the Enterprise Layer is to ensure that effective and innovative solutions are identified and broadly communicated as best practices across the enterprise. Partnerships are an essential element of the Enterprise Layer as Mississippi government seeks to fully leverage the shared services and technology infrastructure.
- **The Agency Layer** represents agencies' business lines. It encourages creative approaches and supports an innovation-centered environment where individual agencies have the time and resources to focus on creative business solutions.

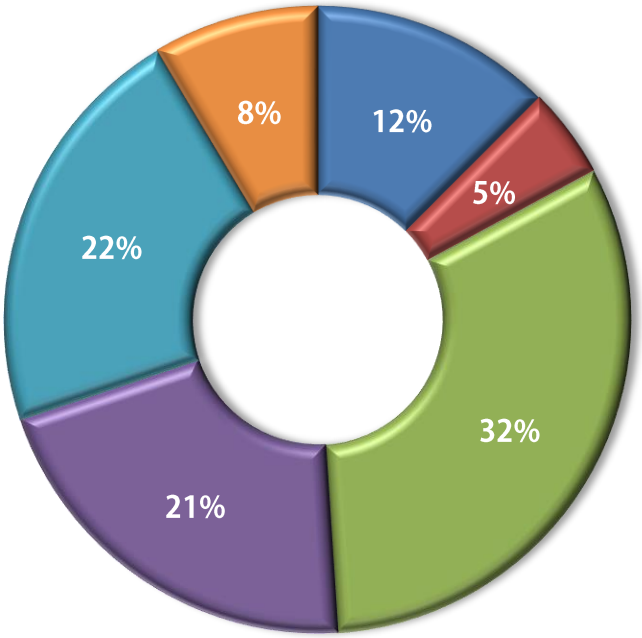
By utilizing the shared services depicted in the bottom layer of the model and by leveraging the statewide enterprise policies, best practices, standards, partnerships, and blueprints reflected in the middle layer, individual agencies are able to innovate with creative solutions that focus on fulfillment of their agency's core missions while taking advantage of enterprise statewide technology architecture. Deployment of innovative technology solutions will expand access to information and services, equip employees with the tools needed to accomplish their jobs, and improve decision making within organizations.

CURRENT IT OUTLAY IN MISSISSIPPI

The spend reflected in this section is as categorized in Mississippi's Accountability System for Government Information and Collaboration (MAGIC) and is only as accurate as the information entered by the state agency at the time the funds were expended. Payments to vendors by schools, libraries, community colleges, universities, and other governing authorities are not included in the noted expenditures. Additionally, the personnel category is not expenditures but an annualized projection of IT filled and vacant positions as of October 31, 2016.

IT OUTLAY BY STATE AGENCIES – FY2016

$246,465,260



- Equipment $30,777,513
- Hardware Maintenance and Support. $11,452,432
- Personnel $78,438,012
- Professional Services and Training $51,471,170
- Software Acquisition / Licensing and Maintenance $53,348,489
- Telecommunications $20,977,644

MISSISSIPPI STRATEGIC MASTER PLAN FOR IT

EXECUTIVE SUMMARY

GOAL 1

Provide, Protect, and Support Enterprise Technology Infrastructure Components to Enable the Effective and Efficient Use of Information Technology

STRATEGIES

- Utilize fully the Primary and Co-Processing Data Centers' technology infrastructure services
- Provide, manage, and facilitate efficient and cost-effective usage of telecommunication services
- Provide, protect, and support enterprise technology infrastructure components to strengthen the security posture of the state

GOAL 2

Investigate, Develop, and Promote Enterprise Business and Technology Solutions to Maximize the Benefits of Shared Services

STRATEGIES

- Implement and promote digital government and mobile solutions to deliver public sector services
- Implement an effective and efficient enterprise email service for state government
- Investigate, propose, and implement an effective and efficient enterprise disaster recovery service
- Investigate, propose, and implement an effective and efficient enterprise hybrid cloud solution for state government

GOAL 3

Promote the Funding, Procurement, and Management of Information Technology as a Strategic Investment

STRATEGIES

- Initiate innovative and collaborative procurement strategies and practices
- Raise awareness and seek alignment of the IT investment process
- Enhance contract management strategies and practices
- Provide innovative and timely information technology training to state employees

GOAL 4

Promote Statewide Sharing of Information Technology Between all State Agencies to Foster a Collaborative Approach to Innovative and Digital Transformation of Government

STRATEGIES

- Develop a technology blueprint that drives improved IT coordination and investment
- Facilitate and coordinate inclusive planning and outreach processes across state government
- Continue emerging technology research and strategic private sector relationships
- Provide effective communications via media-related activities to improve communication with all partner agencies, advance agency's mission and vision, and encourage public interaction

MISSISSIPPI IT GOALS & STRATEGIES

GOAL 1

PROVIDE, PROTECT, AND SUPPORT ENTERPRISE TECHNOLOGY INFRASTRUCTURE COMPONENTS TO ENABLE THE EFFECTIVE AND EFFICIENT USE OF INFORMATION TECHNOLOGY

Strategy 1.1

Utilize fully the Primary and Co-Processing Data Centers' Technology Infrastructure Services

In recent years, many state IT organizations have seen a proliferation of redundant IT hardware and software resources implemented to address state agencies' specific needs. This proliferation has resulted in state agency hardware and software infrastructures with independent operations and a broad range of technical environments, service levels, and security standards. Often, these disparate environments are more expensive to maintain and operate than a federated statewide system. This fragmentation creates a duplication of effort and can present a challenge for statewide disaster preparedness and response. Fully utilizing the investment in the State Data Centers is a critical step toward helping government build a more secure, agile, and cost-effective infrastructure for the delivery of government services.

Action:

- Investigate and implement a cloud-based Disaster Recovery for Open Systems or a dedicated Disaster Recovery collocated infrastructure to reduce cost and provide opportunity for all agencies to directly subscribe to the service as deemed necessary for support of their program areas
- Investigate and implement alternative storage strategies in the Open Systems and Mainframe environments, potentially including pay-as-you-grow and hybrid solutions, to enhance service delivery and increase scalability
- Provide planning and technical leadership to agencies in mission critical re-platforming and modernization initiatives, porting mainframe applications to a new environment, most commonly to UNIX and Wintel environments
- Implement and expand Storage Area Network (SAN) environments by upgrading SAN fabric switches, adding tape capability, and increasing online storage capacity
- Expand Disaster Recovery Services to include options for direct subscription by non-covered agencies, while enhancing and reevaluating business continuity and disaster recovery processes and software environments

- Implement a Configuration Management Database System interfacing with the Service Center System, to assist with help-desk ticket creation and verification of hardware and software components, expanding the Service Center to provide partner agencies with a single point of contact for system monitoring, ticket tracking, and knowledge database
- Build on the benefits of implementing ITIL best practices for incident management, service request management, problem management, and change management
- Provide secure and accessible hosting services in support of the Mississippi Interactive (MSI) infrastructure to support the ms.gov state portal and associated applications
- Expand the usage of Linux on zSeries and Intel platforms, as well as migrate candidate applications to the Linux environment after completing appropriate analysis
- Continue and enhance the implementation of Windows and Unix applications on platforms that leverage standard virtualization technologies and tools
- Research, select, and implement toolsets to provide seamless web access to legacy data residing on any enterprise server
- Enhance and expand the use of enterprise performance monitoring software across all technology stacks
- Develop, maintain, and test disaster recovery and business continuity processes and procedures for critical enterprise state network infrastructure

Strategy 1.2 *Provide, Manage, and Facilitate Efficient and Cost-Effective Usage of Telecommunications Services*

Statewide voice and data communications are provided for state entities and local governing authorities within the Capitol Complex, the Greater Jackson Area, and across the state through a combination of vendor contracts and directly managed services. The current contract for statewide voice and data communications leverages the state's aggregate buying power to ensure that the best possible rates and universal service offerings are available to government entities. This long term contract includes access to local and long distance telephone services, dedicated Internet, broadband data network services, and router management services. Telecommunications services provided directly to agencies within the Capitol Complex include access to the Capitol Complex fiber network, telephone system, voicemail, and high-speed network connectivity to the State Data Centers, Internet, and the Mississippi research network (MissiON).

Action:

- Manage the Statewide Multi-Protocol Label Switching (MPLS) data communications network and related contracts
- Manage and maintain the core data center network and metro area fiber network

- Manage and maintain the statewide enterprise telephone system
- Provide agencies and institutions throughout the state with cost-effective telecommunications services (voice and data) that support the missions and objectives of state government
- Provide agencies and institutions with statewide access to the Internet and computing resources through the state's shared data network infrastructure
- Enhance the state's communications infrastructure (voice and data) to expanded services and provide reliable, secure communications access to state resources and mission critical applications
- Perform annual needs assessments and upgrades to state communications resources at the enterprise level
- Install and maintain the copper and fiber cabling infrastructure in and between all State buildings in the Capital Complex area
- Provide statewide contract for audio, web, and desktop video conferencing
- Monitor, enhance, and modify all telecommunications networks to maximize utilization and decrease operational overhead
- Migrate and consolidate legacy vendor billing for telecommunications services to state approved contracts
- Promote access and use of the state telecommunications contract for governing authorities to improve infrastructure and services and reduce telecommunications expense at the local level
- Manage the implementation of technically sound and cost-effective communications platforms at all newly constructed or renovated facilities through inter-agency policies and procedures
- Coordinate relocation of communications services for all agencies impacted by new building and renovation activities
- Provide value-added services to our clients such as end-user training, enhanced billing services, system administration, network monitoring, and on-going project management
- Examine security functions and services for core voice communications platforms
- Implement Voice over Internet Protocol (VoIP) and other real-time applications, where appropriate
- Coordinate the transition to ITS managed, vendor-provided services to better utilize ITS Telecommunications resources and manage costs related to inventory, support, and maintenance of the statewide network
- Incorporate new and proven industry standards in telecommunications technologies to enhance the service and delivery needs of the state
- Perform billing reconciliations on telecommunications contracts to ensure correct billings by telecommunications vendors

Strategy 1.3 *Provide, Protect, and Support Enterprise Technology Infrastructure Components to Strengthen the Security Posture of the State*

ITS is committed to the Enterprise Security Program for improving the State's cybersecurity posture, integrating security into the business operations of supporting the Enterprise State Network and State Data Centers, operating solutions to reduce the cybersecurity risk every agency faces, and overseeing the enterprise-wide cybersecurity effort. With the complexity of the enterprise and the challenges associated with securing an environment composed of decentralized agencies, enterprise oversight helps the State better understand the aggregate security maturity level of the individual agencies. A successful enterprise approach is dependent on active participation of agencies, government leaders, and policymakers. Cybersecurity must be communicated both at the enterprise level to these stakeholders, as well as internally within each stakeholder's environment. The effort must be continuous, coordinated, and focused.

Action:

- Align the ESP and overall information security program with the National Institute of Standards and Technology (NIST) Cybersecurity Framework, the security controls defined in the 800 series of publications by NIST, the recommendations in the National Governor's Association Call to Action for Cybersecurity paper, and the CIS Critical Security Controls for Effective Cyber Defense
- Research and consideration of developing an RFP for the acquisition of an enterprise security education and awareness training solution to be utilized by agencies for increasing the cybersecurity awareness of state employees
- Research and consideration of developing an RFP for the acquisition of an enterprise virtual private network (VPN) solution for replacing ITS's exiting hosted VPN solution. The VPN solution extends the private network across a public network to both provide authorized users secure remote access to the private network and facilitate secure access to remote third parties
- Request support and funding for the acquisition and implementation of an enterprise perimeter defense solution to enhance the ability to protect SOM assets against attacks by detecting and filtering unwanted software, malicious code, and traffic to malicious sites from user-initiated Internet traffic
- Implement an enterprise managed security service log correlation solution to enhance the ability to collect, manage, and analyze audit logs of events that could help detect, understand, and aid in the recovery from an attack
- Enhance and refine the tools and processes utilized to distribute detailed notification alerts of security incidents detected by the enterprise perimeter defense systems
- Investigate options for enhancing vulnerability scanning efforts to include scanning application-level vulnerabilities

- Establish a relationship with a third party forensics firm to reduce the timeframe required to respond in the event of a major cybersecurity incident
- Research the cybersecurity insurance market for available coverage to mitigate losses from a variety of cyber incidents, including coverage for data destruction, data theft, network damage, and liability of losses to others

GOAL 2

INVESTIGATE, DEVELOP, AND PROMOTE ENTERPRISE BUSINESS AND TECHNOLOGY SOLUTIONS TO MAXIMIZE THE BENEFITS OF SHARED SERVICES

Strategy 2.1 *Implement and Promote Digital Government and Mobile Solutions to Deliver Public Sector Services*

The public-private partnership between the State of Mississippi and Mississippi Interactive (MSI) is focused on the timely and leading-edge delivery of web-based and mobile services in an efficient and cost effective manner. Citizens, businesses, government employees, and local entities benefit from the solutions provided via this program. Effective governance provided by the Electronic Government Oversight Committee (EOC) has afforded MSI clear direction to efficiently prioritize, develop, and launch over 20 interactive services each year. The goal of the partnership is to enable government entities to create program efficiencies, meet legislative service deadlines, and establish a citizen-centric website, as well as an effective social media presence.

Action:

- Provide administration and support for the effective functioning of the EOC, including the use of a methodology for prioritizing the deployment of digital government applications across state government
- Establish Mississippi as an innovative leader in mobile technology offerings
- Expand the use of the eGovernment payment engine, in conjunction with the EOC and Department of Finance and Administration (DFA)
- Continually improve Mississippi's portal, ms.gov, to provide additional information to ms.gov visitors and to encourage the use of digital government services
- Promote the use of MSI services for agency websites, digital government services and mobile applications
- Leverage the eGovernment shared services environment to give state agencies equal access to advanced technologies

- Expand the use of web-based and mobile services to localities and small boards and commissions

Strategy 2.2 *Implement an Effective and Efficient Enterprise Email Service for State Government*

February 2015, an enterprise hosted email solution was established for the state to provide the means of consolidating many agency-managed standalone systems to improve efficiencies, drive standardization, modernization, and leverage the state's volume buying power to reduce overall cost. The solution is built on Microsoft's Office 365 platform, which further expands the capabilities and benefits beyond traditional email services and is also available to local government. When fully implemented, the Office 365 platform will provide the state with a common naming convention, comprehensive employee address book, calendaring, archival, and legal hold, as well as access to other enhanced hosted service offerings such as SharePoint, Skype, and the complete Office 365 suite.

Action:

- Continue to solicit executive support for a centralized email solution with a focus on operational efficiencies and potential cost savings
- Develop a comprehensive identity management solution for state government
- Continue to communicate with state agencies concerning the core email functionality and infrastructure required to continue day-to-day operations and the desired functionalities to improve productivity
- Work toward a single licensing agreement that will consolidate existing individual contracts into a statewide enterprise solution
- Develop a comprehensive reporting and management tool to capture usage and performance measures related to the services provided
- Continue to research and implement best practices to promote and accelerate the enterprise cloud email migration strategy for the state

Strategy 2.3 *Investigate, Propose, and Implement an Effective and Efficient Enterprise Disaster Recovery Service*

The modernization of many government applications coupled with web enabled access makes it necessary for the state to rethink and significantly improve its existing disaster recovery strategy. Today's citizens expect conducting business with the government to be as instantaneous and reliable as doing business across the Internet. Having a robust disaster recovery plan and enterprise backup solution are vital to meet recovery time and recovery point objectives to sustain accessibility to government resources in the event of a disaster.

Action:

- Create an improved comprehensive disaster recovery strategy tailored to meet the state's requirements for recovery time and recovery point objectives

- Develop an enterprise disaster recovery solution through strategic partnerships
- Evaluate direct-to-cloud and hybrid backup solutions to safeguard state information
- Ensure off-site data is secure with approved encryption and security measures
- Foster executive support of the enterprise disaster recover service available to state agencies
- Test regularly to ensure disaster recovery capabilities are adequate and functional

Strategy 2.4 *Investigate, Propose, and Implement an Effective and Efficient Enterprise Hybrid Cloud Solution for State Government*

Cloud computing has moved to the forefront of IT in the public sector, with the promise of efficiencies and cost savings prominent in the value proposition. Many state governments, during the stress of the Great Recession, sought to consolidate data centers and technical services. Similarly, the foundation of cloud computing is the concept of converged infrastructure and shared services. Cloud has also simplified the cyclic Capital Expenditure (CAPEX) model – the need to procure, implement, and run dedicated infrastructure – to a more obtainable Operating Expense (OPEX) model – a pay-as-you-go shared service model. Maximizing the economies of scale in the cloud is a potent driver allowing agencies to avoid upfront infrastructure costs, with improved manageability and normalization of fluctuating and unpredictable resource demand. The rapid commoditization of computing resources has led to high growth in cloud services.

Action:

- Investigate the development of a hybrid cloud solution where the selected business partner owns and manages all technical aspects in the cloud to provide a low cost, general purpose, and virtual compute and storage environments via a self-service portal
- Leverage the State Data Center's physical and mechanical resources to support a long term partnership with a vendor to provide a robust hybrid cloud solution
- Develop a delivery model that will provide partner agencies the ability to rapidly provision compute and storage needs via a self-service web interface
- Document the development of an instance based (small, medium, large, and extra-large) service menu
- Establish a portal interface to broker select cloud solutions and allow for the transfer of services between approved cloud service providers
- Investigate co-location and cloud solutions that will provide a highly available disaster recovery and backup server environment using hypervisor technology

- Work with selected business partner to improve Service Level Agreements for disaster recovery and backup solutions
- Investigate the use of off-the-shelf technology for network/compute/storage hardware and backup software
- Document cloud best-practice industry security standards

GOAL 3

PROMOTE THE FUNDING, PROCUREMENT, AND MANAGEMENT OF INFORMATION TECHNOLOGY AS A STRATEGIC INVESTMENT

Strategy 3.1 *Initiate Innovative and Collaborative Procurement Strategies and Practices*

ITS assists state agencies, universities, and local governing authorities with the acquisition of IT hardware, software, and services. An ongoing initiative is the re-engineering and continuous improvement of procurement processes and procedures through both strategic and incremental changes. In addition, focus is placed on the identification of collaboration opportunities, whereby procurements are conducted to provide the state's technology infrastructure, to facilitate the use of that infrastructure, and where multiple agencies can benefit from a single procurement. Improvements in the procurement process focus on the following initiatives with the goal of providing better service to our partner agencies and cost savings to the state.

Action:

- Facilitate the technology procurement process through the utilization of MAGIC, Mississippi's statewide SAP Enterprise Resource Planning (ERP) solution
- Continue to enhance the procurement process to provide accessibility and transparency to both vendors and procurement clients through the utilization of web-enabled applications, including:
  - Web publication of Request for Proposals (RFP) and sole source content and advertisements;
  - Dynamic presentation of procurement status information;
  - Publication of agendas and minutes for ITS Board meetings; and
  - Publication of procurement outcome/award information
- Continue to enhance and standardize best practices for RFP and sole source format, content, and proposal evaluation methodologies
- Align government purchasing options for IT equipment and service solutions with the state's *Technology Infrastructure and Architecture Plan*
- Work with manufacturers and resellers on the Express Products Lists (EPL) business model, providing agencies with a choice of current technologies in a timely and cost-effective manner

- Enhance internal ITS procurement processes, emphasizing consistent, appropriate, and timely processing of all requests, plus, effectively respond to seasonal workload fluctuations caused by agency funding constraints
- Provide for pre-approved commodity-level procurements at IT Plan review time for agencies with comprehensive technology plans
- Provide proactive training to the vendor and partner agencies communities regarding procurement law and procedures, timelines, and best practices
- Facilitate dialog between the ITS Board and partner agencies on technology strategy and initiatives
- Coordinate the procurement process with the IT planning process to address partner agency requests and technology direction proactively
- Identify and promote opportunities for utilization of existing technical resources in lieu of procuring redundant equipment and products
- Coordinate the requirements of multiple partner agency entities in developing procurement instruments that leverage the state's combined purchasing power to achieve the best possible discounts for technology products and services
- Facilitate the acquisition and adoption of enterprise solutions to provide standard products across state government for common functions

Strategy 3.2 *Raise Awareness and Seek Alignment of the IT Investment Process*

The National Association of State Chief Information Officers (NASCIO), the National Association of State Technology Directors (NASTD) and the National Governors Association (NGA) strongly emphasize the need for a strategic IT investment process which ensures that state agencies utilize innovative, smart-buying, investment techniques. With IT becoming a critical component of state government infrastructure, many states have focused on using IT to solve problems in government operations. However, choosing an IT application requires a strong business case that it can meet citizens' needs better, facilitate business/government interactions, and improve internal government processes, at reasonable cost and with ease of implementation. Currently, the budgeting and funding of IT within Mississippi state government is accomplished on an agency by agency basis. Many opportunities exist that Mississippi can leverage to accomplish an increasingly strategic investment of IT resources across the statewide enterprise, including strategically planning for upgrades, transferring cost savings to fund applications, and implementing return-on-investment programs.

Action:

- Seek opportunities to develop and implement IT services that are common to multiple agencies and governmental programs in order to minimize duplication of efforts among organizations

- Utilize economies of scale by spreading fixed costs over larger volumes to reduce overall unit costs, efficiently leveraging scarce and expensive IT staff resources
- Focus on enhancing input and direction from the state's executive and legislative leadership with aims to achieve economies of scale, increase accountability, and implement enterprise-focused solutions
- Seek interagency dialogue to address the enterprise of state government across all functions to enable the use of common software, hardware, communication systems, data applications, and professional service contracts
- Focus on enabling strategic technology projects to be critiqued and prioritized by the state's executive and legislative leadership, with funding appropriated via a separate budgeting process and management monitored and reported through a Project Management Office
- Improve current, traditional IT funding approaches by expanding adoption of innovative and alternative funding models focused on enabling the state to deliver savings and improve services to citizens
- Investigate the transfer of savings from shared service IT initiatives to fund applications and upgrades

Strategy 3.3 *Enhance Contract Management Strategies and Practices*

ITS contracts on behalf of state agencies, universities, and other government procurement clients for the acquisition of IT hardware, software, and services. An ongoing initiative is the continuous improvement of contract development and negotiation strategies and practices, and contract management strategies and practices, with the ultimate goal of strengthening the state's contractual position with technology vendors for the mutually beneficial and efficient delivery of technology products and services to government.

Action:

- Continue to enhance the development of vendor contracts
- Incorporate contractual terms and conditions to support the evolution of technology and its implementation in state government
- Administer and manage the state's software escrow services contract for use by state government agencies
- Administer and manage the state's Cellular Master Agreement for the delivery of cellular devices and service to state and local government
- Administer and manage the state's e-Government Agreement for the delivery of electronic government services to state and local government

Strategy

3.4

Provide Innovative and Timely Information Technology Training to State Employees

ITS provides both self-paced, online training to Mississippi public entities via the Internet as well as more traditional classroom training. The online training is available to state agencies, county and local governments, public schools, community colleges, and institutions of higher learning. There are currently over 1,000 courses in technical, end-user, and professional development topics with new courses added quarterly. For classroom based training, ITS provides an ongoing program designed to enhance and improve the skills of state employees who develop or use information systems.

Action:

- Provide self-paced, online training to Mississippi public entities via the Internet
- Provide continuous curriculum updates to keep pace with new and emerging technologies including new products and new releases of software, either through instructor led training or online learning
- Provide customized information systems training for Mississippi public entities upon request
- Provide a comprehensive information systems training program for end-users, technical, and managerial personnel
- Maintain modern state-of-the-art lab facilities to provide training on new as well as mature products and releases of software

GOAL 4:

PROMOTE STATEWIDE SHARING OF INFORMATION TECHNOLOGY BETWEEN ALL STATE AGENCIES TO FOSTER A COLLABORATIVE APPROACH TO INNOVATION AND DIGITAL TRANSFORMATION OF GOVERNMENT

Strategy

4.1

Develop a Technology Blueprint that Drives Improved IT Coordination and Investment

Many states are investigating the link between a technology blueprints, often referred to as an Enterprise Architecture, and IT enterprise investments. A technology blueprint depicts the technology components for a statewide IT system. It is a holistic, comprehensive planning approach for a government enterprise that integrates information and services across government agency boundaries. A technology blueprint supports the coordination of various IT support functions. It also can create and enforce statewide standards and policies for data, security, purchasing, management, and operational procedures for all technology investments.

Action:

- Implement a standards-based blueprint for the state's use of technology, which addresses the whole enterprise of state government and enables data sharing across all government functions to enable the use of common software, hardware, communication systems, and data applications
- Optimize shared technology components, including mainframe computers, email systems, data centers, servers, vendor platforms, storage, help desks, applications, and networks to reduce initial purchase and ongoing maintenance costs, ensure better use of existing IT assets, and promote interoperability
- Review existing policies, standards, guidelines, and purchasing instruments for consistency and alignment to the state's strategic direction
- Work with agencies to identify and review business processes that are common across multiple agencies
- Support inter-agency efforts regarding collaborative initiatives for specific business areas such as GIS, employment security, retirement systems, and human services
- Develop, when appropriate, a business case that considers alternatives and recommends actions related to future shared services that will provide value and cost savings
- Coordinate statewide enterprise architecture and planning initiatives

Strategy 4.2 *Facilitate and Coordinate Inclusive Planning and Outreach Processes across State Government*

ITS desires to make the greatest impact possible through the consistent delivery of services and the efficient use of IT resources. We make every effort to work with our partner agencies to find the best and most economical solution to their technology needs. Planning for technology allows our partner agencies to invest scarce public resources in strategically planned projects in order to improve productivity of government workers and improve service delivery to the citizens and businesses of Mississippi. ITS has a dedicated staff that consults with partner agencies on the services available through the State Data Center, as well as the acquisition of technology products and services, telecommunication solutions, and security. We will continue to provide outreach to state government entities, to improve communication with our partner agencies, and to provide resources to assist with technology products and services.

Action:

- Facilitate partner agency outreach meetings to review technology based services provided by ITS, review services currently provided, help ensure partner agency satisfaction, and review agency project lists for potential opportunities to efficiently utilize information technology resources and provide capacity planning
- Develop ongoing interactive statewide IT advisory groups to help set direction and establish priorities for state technology initiatives

- Provide support and online tools to agencies, boards, and commission to assist in the budgeting and planning of technology projects
- Implement a new technology planning system that has more functionality and better reporting
- Review partner agency technology plans for statewide infrastructure impact and needs, opportunities for agency collaboration, potential volume purchases, technology training and education opportunities, and other focus areas
- Provide guidance and assistance to agencies in developing business case analysis on strategic projects
- Facilitate weekly change management calls with partner agencies to promote communications
- Develop surveys to capture information from agencies regarding services, performance, and various other topics
- Host interactive forums to inform stakeholders of changes in services, policies or procedures, standards, or costs for specific areas of service
- Facilitate statewide conferences with a technology agenda based on agency feedback
- Cultivate and strengthen existing partner agency relationships by developing mechanisms to facilitate outreach and information sharing with stakeholders.

Strategy 4.3 *Continued Emerging Technology research and strategic private sector relationships*

ITS utilizes research capabilities and vendor relationships to keep pace with industry standard technologies. ITS monitors changes and future technology trends in the IT ecosystem to embrace advanced technology to service the government needs of the state. The continued research is used in conjunction with agency technology plans, emerging technology initiatives, participation in national organizations, and vendor relationships to build strategic technology roadmaps for the future.

Action:

- Fully utilize partnerships with leading IT research and advisory firms
- Continued involvement in national technology organizations with a focus on state government
- Continued research in new innovative technologies to stay abreast of the latest advances in technology
- Enhanced partnerships with other government entities to understand how they are implementing new technologies

Strategy

4.4

Provide effective communications via media-related activities to improve communication with all partner agencies, advance the ITS mission and vision, and encourage public interaction

ITS strives to continue providing effective outreach to state government entities, to improve communication with all partner agencies, and to provide resources to assist with technology products and services.

Action:

- Identify communication challenges and customize how and what is communicated to internal and external audiences.
- Analyze communication platforms and methods to align different forms and channels of communication to audience and message.
- Develop and ensure the ITS website and social media maintains a content strategy focused on the planning, creation, delivery and governance of content.
- Manage production of strategic publications such as the *Mississippi Strategic Master Plan for Information Technology, Mississippi Technology Infrastructure and Architecture Plan, Mississippi Department of Information Technology Services (ITS) Annual Report, 5 Year Strategic Plan,* and *ITS Services Catalog* along with additional brochures, manuals, surveys etc.
- Seek out potential opportunities for award recognition on the national level in highlighting the great work done by state entities for providing our citizens with exceptional information technology services.
- Provide consultative services to coordinate the development, effectiveness, and use of electronic and printed materials for public and professional meetings, seminars, and conferences.

Mississippi IT at Work

Each year, state agencies in Mississippi work to enhance government services by leveraging technology to implement strategic systems. The systems featured in this year's "Mississippi IT at Work" section of the *2017-2019 State of Mississippi Strategic Master Plan for Information Technology* provide improved services to citizens, businesses, and state employees through the implementation of innovative IT applications.

Advanced Traffic Management System

Mississippi Department of Transportation

Mississippi Department of Transportation (MDOT) acquired and customized an Advanced Traffic Management System (ATMS) to serve as a central control for all of MDOT's Intelligent Transportation Management System field devices and traveler information dissemination systems. The ATMS allows MDOT to integrate multiple technologies in the field into one control software to collect real-time traffic data. The same system then allows MDOT to communicate that information to the public through public information platforms. The data collected is also communicated to emergency

response agencies and the media. Since its inception, MDOT has managed over 21,700 traffic incidents on MDOT-maintained roadways with its ATMS, enhancing traveler safety and helping travelers avoid travel delays.

In collaboration with other states, MDOT deployed Intelligent Transportation Management Systems improvements on bridges that span the MS River in MS, Arkansas, and Louisiana. The improvements included dynamic messaging signs, vehicle detection devices, closed-circuit television, advisory radio, fiber connections that coordinate communication across the bridges, and real-time river monitoring that help to prevent collisions by barge traffic into bridge piers. And, they enabled agencies to better manage their transportation assets with real-time information, improving efficiency, safety, and economic competitiveness for freight traffic that travels by river and highway since barge accidents can shut road and river traffic down for hours or days. MDOT's work on this project gained national attention as Mississippi was awarded the Best New Innovative Deployment award by Intelligent Transportation Management Systems America which honors the most innovative, effective and influential achievements in this area nationwide.

Architects – Online Applications

Mississippi State Board of Architecture

The Mississippi State Board of Architecture (MSBOA) sought a way to improve their outdated online application process and increase the level of involvement in which they engage citizens. MSBOA launched a full suite of eleven mobile responsive online applications aimed at placing a wealth of information and services right at user's fingertips. The suite launch made MSBOA one of the only Mississippi government entities where all business can be conducted electronically.

The application suite categorizes online services across the three professions managed by MSBOA: Architects, Landscape Architects, and Interior Designers. Constituents interested in pursuing careers can quickly access experience and degree requirements, identify accredited programs, and link directly to MSBOA resources. Users can easily complete renewals, reinstatements, applications, and purchase rosters. With the launch

of the application suite, MSBOA realized 100% electronic adoption from day one for all disciplines under the board's jurisdiction.

The updated application suite brought eleven services online into one central location while providing a modern, mobile-optimized user interface with a refreshed look. Enhancements included:

- Seamless integration of license sales with the mobile applications accessible from any device
- Addition of intuitive requests for information based on user's responses
- Reconfiguration of the real-time web service connection with MSBOA's back end license vendor
- Rebranding of the online user interface to align with MSBOA's recent website redesign
- Integration of Licensee and Certificate holder profile
- Implementation of Application regeneration
- Improvement to Continuing Education course calculations for late renewal license purchases and license reinstatement applicants

Since its launch, the revamped system has created significant operational efficiencies for MSBOA staff through the removal of manual methods. The MSBOA now has a 100% online licensee adoption after the launch of the new system. Among the cumulative page views, the application suite maintains an almost even balance of new users versus returning users. The fluidity of the mobile-optimized site and application suite allows licensees to effortlessly access information and securely complete online transactions from any platform.

COP

Mississippi Emergency Management

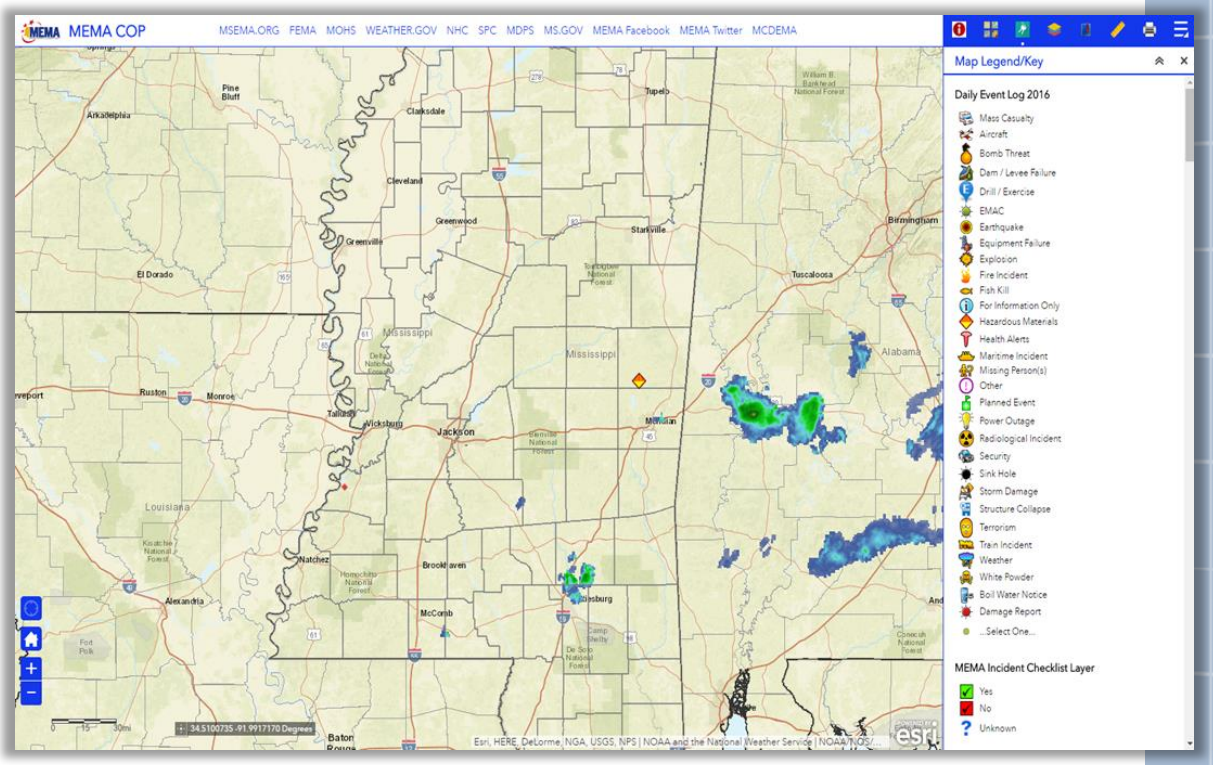
Approximately eight years ago the Mississippi Emergency Management Agency (MEMA) began looking at ways to spatially display information digitally, in real-time. Information is extremely important in emergency management. The ability to communicate this information effectively is critical to any disaster response, and subsequent recovery. The problem typically has been integrating the existing tabular data in to a Geographic Information System (GIS) dynamic digital map. These map products are referred to as Common Operating Pictures (COPs). A COP integrates information with its spatial component so that decision makers benefit by knowing the location of persons, places, things and events as they are occurring.

MEMA employs a software product called WebEOC (Intermedix). WebEOC provides the mechanism for effective information management and event reporting. As an information management tool, WebEOC is used to track files, contact information, plans and procedures. This makes it simple to access important resources enhancing emergency preparedness. Simply put, information is collected and stored for referral during disaster response. Event reporting is another facet of WebEOC. Position specific activity logging and significant events tracking provide the key elements to accurately depict the real-time COP lifecycle of an incident.

Until recently it had been challenging and costly to integrate WebEOC data into GIS. The process involved customized code writing to read the WebEOC data via its SQL database. This scenario was clunky and required an astute programmer to figure it out. If an organization lacked an in-house programmer, the process required costly development hours. As an organization, you were at the mercy of your developer if you wanted to make any changes. This was problematic given the fact that GIS software

companies such as ESRI have made great strides in tailoring GIS software for maximum use and versatility by its users.

In 2014 MEMA began using ESRI's ArcGIS Online (AGOL). AGOL in essence was cloud driven GIS. It provided ESRI users with a rich data sharing environment that allowed the creation and greater customization of web maps and applications. Templates made available on AGOL gave the power of development to the GIS professional and didn't require them to have programming skillsets. AGOL provided the tools necessary to richly depict spatial data in its purest form. It translated this data into interactive maps and applications consumers and decision makers were able to use. Fast-forward to the early part of 2016, Intermedix and ESRI joined forces to develop an API that allowed the seamless sharing of WebEOC Boards as feature services with AGOL. Feature Services contain all of the information bundled, AGOL needs to transmit the exact location of the person, place, thing, or event. MEMA uses the Daily Event Log within WebEOC to track real-time events occurring in Mississippi from the moment they are reported to MEMA to the time they are resolved. For example, if an accident occurs



on a Mississippi highway and a hazardous chemical is spilled, this information can be shown spatially and include details as to who is responding, injuries, evacuation information, etc.

In mid-2016 MEMA GIS created the MEMA COP. The COP provides real-time situational awareness based on data that is dynamically collected from WebEOC. Additionally, services are being consumed from the US Geological Survey (USGS), MS Department of Transportation (MDOT), National Oceanic and Atmospheric Administration (NOAA) and the Federal Emergency Management Agency (FEMA) just to name a few. These organizations are providing dynamic information concerning weather, earthquakes and the conditions of MS roadways to include traffic cameras.

The MEMA COP greatly enhances situational awareness and communications. It's just one more tool in the arsenal that decision makers have at their disposal during an Emergency Response.

MS.GOV

Mississippi's Official State Website

2016 marked the second consecutive year for Mississippi's Official State Website, ms.gov, to place among top five best websites in country in the Center for Digital Government's "Best of the Web" competition. The awards program is the original and most respected state and local government digital technology competition in the United States, recognizing the best government digital innovations across the country. The Center for Digital Government has repeatedly recognized Mississippi as having one of the best state websites in the country, placing top ten in 2012 and 2013, fourth in 2015, and now third in 2016.

Intuitive and visually engaging user-focused content governed the 2016 design of ms.gov. Whether it's the convenience of in-site bookmark vault, analytic driven content, or voice command technology integration, ms.gov is purposed around one priority, the user. The ms.gov site design and content organization was guided solely by citizen engagement through the use of analytics and feedback. The cornerstone feature in 2016 was the integration with the popular digital assistant, Amazon Echo. The "Ask Mississippi" Alexa skill, available to myMS users, enhances the citizen to government relationship in Mississippi, allowing residents to connect, hands-free, with state government.

Ms.gov is a joint effort between the State of Mississippi and Mississippi's eGovernment partner, Mississippi Interactive (MSI). Under a self-funded model, ms.gov's design is completed at no cost to the state or citizens. To date, the design, maintenance, and customer support efforts of ms.gov are valued at over $1.1 million. Services launched through the eGovernment program have been nationally recognized with forty awards in the past six years, including multiple AIVA Communicator Awards, IMA Best in Class Award, Gold and Platinum Hermes Creative Awards, and multiple WMA Outstanding Achievement Awards. A full listing of Mississippi's eGovernment awards can be found at ms.gov.

The eGovernment partnership between MSI and the State of Mississippi, has garnered the creation of 178 online and mobile services aimed at assisting citizens in day-to-day interactions with state government. The success of Mississippi's eGov services can be seen in the over 161,000 individual downloads of native mobile apps, electronic revenue collected on behalf of the State in excess of $178 million, and the 50+ percent mobile/tablet adoption of prime services including online hunting and fishing license sales and online driver license renewals. Through this public-private partnership, and its

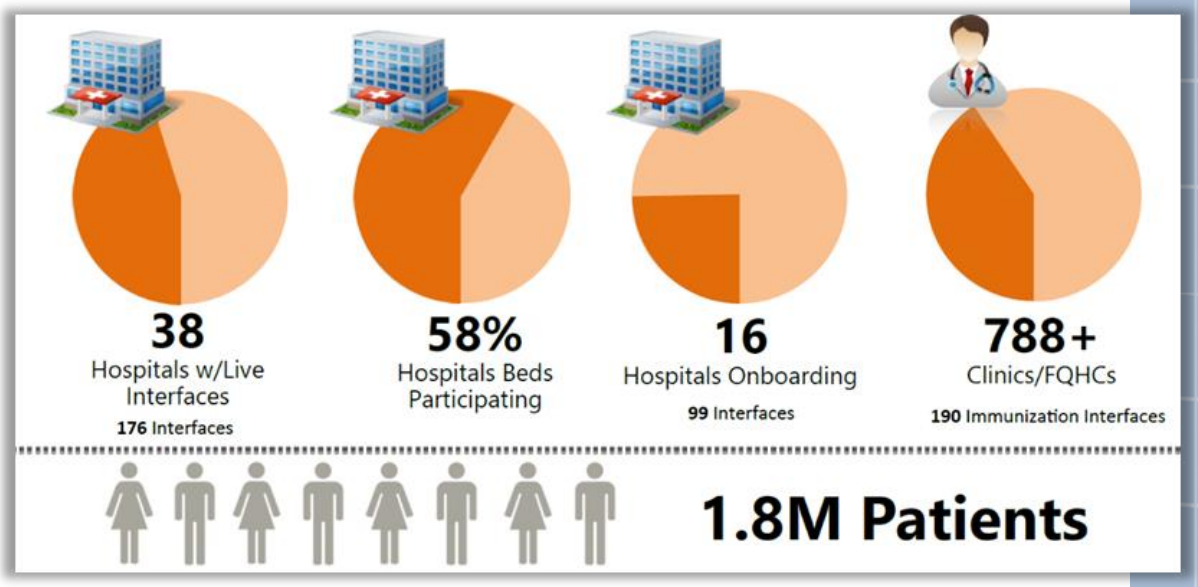
focus on efficient government solutions, the State of Mississippi has realized a cost savings in excess of $1 million per year; over $6.3 million to date.

The eGovernment program intends to continue its initiative to bring State business to the fingertips of all Mississippi citizens and visitors by way of custom web-based services, innovative mobile applications, online payment processing, enterprise solutions, point of sale, and website design. It is the eGovernment program's goal to keep the State of Mississippi at the forefront of technology and promote efficiencies for residents, businesses and visitors for many years to come.

MS-HIN

Mississippi Health Information Network

The Mississippi Health Information Network (MS-HIN) is a secure electronic exchange of patient information which allows health care providers a quick, secure, reliable access to patient health records. The MS-HIN provides a patient's complete medical history at the point of care fostering better quality care in a more efficient manner. The MS-HIN has the mission of providing a sustainable, trusted exchange of health information to improve the quality, safety, and efficiency of healthcare for all Mississippians. With the patient's consent, MS-HIN makes all relevant information securely available to providers treating a patient. In this way, informed decisions can be made about the patient's care. MS-HIN serves as MS's centralized repository of health care information, collecting data from partners and making that data securely available to clinicians providing treatment or coordinating care with their patients.



MS-HIN collects data from data sharing partners (e.g., Mississippi hospitals, commercial laboratories, and health care providers' EHRs, etc.), and makes the data securely available to clinicians who are providing treatment or coordinating care for their patients. MS-HIN also offers secure email, electronic referrals, alert notifications and medication history lookup services to Mississippi providers. In addition, MS-HIN is helping providers meet federally required health information technology standards surrounding Meaningful Use (MU). The Centers for Medicare and Medicaid Services require providers to meet technology standards which incorporate implementing

electronic health records and sharing clinical data. MS-HIN has assisted 2118 providers in receiving $159 Million in Meaning Use incentive funds.

MS-HIN has aggressively added hospitals to the network. MS-HIN has 38 hospitals sending data and soon will be adding another 16 hospitals. By the end of 2016, the goal is to have roughly 70% of the hospitals in MS contributing data, allowing providers to share data for over 1.5 million patients. These hospital connections are generating more that 7 million transactions a month. MS-HIN offers a Community Health Record (CHR) system that consolidates each patient's information into a single 'chart' for their provider.

Medicaid Patient Data Exchange

Department of Medicaid | University Mississippi Medical Center

Mississippi became the first state in the nation to exchange Medicaid patient medical data successfully in real-time with a health system. The Mississippi Division of Medicaid (DOM) partnered with the University of Mississippi Medical Center (UMMC), the State's largest public hospital, to devise a program that transfers Medicaid claims information and translates it into clinical data. Partnering with UMMC, DOM worked with Epic, the electronic medical records system utilized by UMMC, to devise a program that transfers claims information from the agency and translates it into clinical data. The process is a bi-directional exchange of data. Within 3 hours of the end of the encounter, UMMC sends clinical data back to DOM for each patient that UMMC processes. DOM stores the clinical data in a clinical repository to augment the information currently contained in the beneficiary's medical record. Physicians can now review the electronic medical history of DOM patients, allowing doctors to make better-informed decisions in real-time. Mississippi beneficiaries of Medicaid will see benefits from having their complete medical history available at the point of medical care, which will improve the efficiency, safety, and overall care of the patient.

UMMC is the largest provider of Medicaid patients in Mississippi. Consequently, this innovation results in a significant increase in the level of care for many. By increasing health data access for such a high volume of Medicaid patients, DOM and UMMC are able to deliver more informed care that will drive better patient outcomes in a highly efficient manner. And, because patient information is now digitally stored as a single, longitudinal file, other project benefits include an increased ability to track the overall health of the State's Medicaid population and detect population health trends such as those pertaining to immunizations and tobacco use. The success of this initiative has caused DOM to become a model agency for the nation in the area of clinical data exchange of patient data.

Mississippi: The Future State

Today in Mississippi state government, information technology (IT) is at the core of all government services to serve citizens, businesses, and employees. Information Technology Services' (ITS) statutory requirements directs ITS to maximize the benefits of IT through procurements, planning, and effective and efficient use of the state's enterprise IT resources by all state agencies. To that end, ITS collaborates with state agencies and institutions to assess emerging technology trends which will benefit the individual agencies, statewide enterprise IT services, and subsequently, the whole of state government.

Since its inception, ITS has fulfilled its mission by adapting to changes not only in the landscape of Mississippi state government, but also by adopting service-oriented business practices. These practices allow for more choice and flexibility in developing and implementing technology solutions, which includes research, testing, assessment, and recommendation of new technologies. Where applicable, ITS collaborates with agencies and institutions to implement pilot technical projects that would be beneficial to multiple agencies across the state.

Connected Workplace

The workforce drawn to public service will, in the future, be digitally capable, from entry-level employees to high-level administrators. As with all sectors, a premium is placed on employee satisfaction, productivity, and effectiveness. And while the mission of many public sector programs will remain intact, the nature of work and the culture of the workplace will change dramatically. The rapid commoditization of technologies, as well as ease of access to these technology products will create a work environment where employees are more agile and engaged, centered on consumer-oriented styles and technologies. Public sector IT leaders need to communicate the need to build a more social, mobile, accessible and information-driven work environment, exploiting private sector innovations, and equipping government to operate with greater efficiency and effectiveness. The public sector, mobile workplace will need to be responsive to a strategy which leverages multiple operating channels, so that each can be optimized in its own right and, when integrated with the other channels, deliver measurable benefits for all citizen stakeholders.

Digital Government Transformation

The business of government is changing at an accelerating pace in all levels of government. The digitalization of society is driving government to become more open and horizontally aware across adjacent domains in order to integrate and coordinate services for the improvement of outcomes and citizen experiences. The digital transformation is driven by the embrace of social technologies and the rapid adoption of cloud and mobile services, government organizations are becoming more accessible, open and accountable. A proliferation of configurable commercial off-the-shelf and as-a-service products makes rapid deployment of new services possible. This standardization and optimization of common business processes often entails significant cultural and organizational change. Government agencies in Mississippi must consider how digital technologies and data can be embedded into the statewide organization so that continuous business transformation becomes the cultural norm.

Enhanced Citizen Access

Mississippi took citizen interaction a step forward in 2016 with the introduction of the "Ask Mississippi" Amazon Alexa skill. We live in a world today where technology has been embraced across generations. People expect technology to respond and deliver at the touch of a button or at the sound of a command. Amazon Echo users and myMS subscribers can now take advantage of the voice command technology to connect, hands free, with Mississippi government. All you have to do is ask.

- Stay on top of important dates – "Alexa, ask Mississippi when my driver license expires."
- Contact the state – "Hey Alexa, Ask Mississippi, what is the phone number to the Department of Revenue?"

- Verify elected officials and facts – “Alexa, ask Mississippi who the current Lieutenant Governor is.”
- Learn more about our state – “Alexa, ask Mississippi to tell me story.”

Mississippi was one of the first states to (second behind Utah) to launch a government skill for the Echo.

Looking to the future, enhancing citizen access with a multichannel strategy will be required to provide intuitive access to services by diverse demographic groups, regardless of socioeconomic status or physical limitations. With the rise of digital government, many citizens have viewed government as a single entity. The expectation of enhanced access will trend upwards over time, with citizens remaining largely unconcerned about governmental boundaries and jurisdictions. A strategy of increased access will require investment, acknowledging that citizens' baseline expectations about government performance are shaped by how private-sector businesses accommodate their needs and preferences. In the realm of performance-based budgeting, metrics reflecting citizen satisfaction and achieved outcomes will play a large role in how government programs are evaluated and ultimately funded.

Delivering an effective citizen experience requires a holistic approach to the citizen: (1) using data to capture and understand the needs and desires of the citizen; (2) leveraging effective social media and communications to actively engage citizens; (3) allowing the citizen to engage on his or her own terms; (4) understanding the citizen's preferred engagement channels; (5) affording seamless transitions among channels; and (6) ultimately delivering a more satisfying set of citizen interactions. Adopting a citizen-centric information management strategy with multichannel citizen engagement opportunities will deliver quantifiable benefits.

Governments must adopt a more data-driven approach to citizen experiences and citizen engagement. Leveraging all available data (including social media and other external sources) can provide a much more complete picture of the citizens, their service perceptions and their unmet needs. Governments must be prepared to meet citizens on their own terms and via their preferred channels (for example, online, in-person, by phone, via mobile device).

Citizen ID - As government becomes more digital, digital identity will need to become more reliable in order to serve as the core for all digital transactions. Citizen electronic identification (e-ID) refers to the orchestrated set of processes and technologies managed by governments to provide a secure domain to enable citizens to access these core resources or services. Government should require online authentication and identity proofing, because in-person verification methods are becoming outdated for offering citizens integrated and seamless access to resources and services. This "no wrong door" business model must be able to associate each citizen with one unique and persistent identifier within the bounds of what is culturally acceptable and legally permissible.

IT as a Service

Many traditional IT services will be offered as a service, with cloud computing being the most generic, and prominent service discussed today. The promise of IT as a service is a financial conversion from period capital expenditures to a more stable operational expense. Cloud computing offers responsiveness, timeliness, and cost effectiveness. For public sector shared services, where typically there is already an internal cloud and large existing user base, it makes sense that consideration would be given to internal resources first, and the “as a service” catalog would be grown out of existing services

that could be effectively and efficiently adapted to the cloud model. Future cloud-based projects will be described as business initiatives rather than IT initiatives. Cost reductions combined with rapid application deployments and improved security features represent a “win-win” situation for budget conscious governments.

Internet of Things (IoT)

The Internet of Things (IoT) is the architecture of dedicated physical objects (things) that contain embedded technology to sense or interact with their internal state or external environment. The IoT is not restricted to the internet and can be experienced through any medium that supports communication between the thing and its associated applications. The IoT architecture operates in an ecosystem that includes things, communication, applications and data analysis, and is a critical enabler for digital business applications in all private-sector and public-sector industries.

Public sector agencies can expect IoT-driven changes in several different areas, including environmental or public infrastructure monitoring, emergency response, supply chain inspection, asset and fleet management, and traffic safety. Wearable devices and mobile health monitoring devices will collect lifestyle, behavioral and health data that will help manage the costs of publicly financed health insurance and healthcare programs. A forecast from the Gartner group states that we will have over 25 billion installed things by 2020, with 6.8 billion alone in smart government infrastructure, suggests that IoT deployments will become a daunting array of components, ubiquitous connectivity, embedded intelligence and software with few standards.

IoT architectures, however, offer greater opportunities when the data from IoT devices can be shared with other entities — for example, license plate recognition in order to improve the effectiveness of Department of Motor Vehicles (DMV), traffic control or intelligent traffic systems. This requires the definition of IoT architecture interoperability with various back-office processes of multiple entities, which may have different levels of understanding about the impact of IoT data on their enterprise information architecture. Assessing organizational change readiness and determining performance, security, technical, data or other requirements are essential to building environments that can accommodate differing architectures and new business models.

Smart Machines

In practice, smart machines are a diverse combination of digital technologies that do what we once thought only people could do. While the list of smart machine capabilities is evolving rapidly, it already includes deep neural networks, autonomous vehicles (mining), virtual assistants (with services for specific users, such as knowledge workers), and smart advisors (visual battlefield reporting, customer service) that interact intelligently with people and other machines.

Government IT leaders must explore smart machines as enhancements to existing business practices, and possibly as foundations for new public services or ways of accomplishing business goals altogether.

Smart machines offer and require higher degrees of automation than many existing government interactions, controls, or workflows can deliver. Governments' organizational ability to move beyond traditional thinking and incremental improvement will impact the speed at which smart machines are adopted. It is predicted that smart machines will be the most disruptive class of technologies over the next 10 years.

Social Media and Public Sector

The continuing rise of social media, platforms which foster two-way communication, allows citizens to experience a personal connection with state officials and employees, thus enhancing a sense of participation in the business of government. Real-time conversations and transparency offer a glimpse into the everyday workings of government. Social media has played a role in the creation of a more digital, and connected workplace, as well as enhancing citizen access. To this end, emerging technologies and the evolving social networking tools will require constant modifications to policy frameworks to ensure ongoing relevancy. With a third place finish in the 2016 Best of Web competition, ms.gov continues to innovate, delivering future-focused user experiences on the web, using a mobile-first approach focused on the tablet and smart phone market. In FY2016 ms.gov social media made over 300,000 citizen impressions.

Strategic Data Management

The introduction and combination of new and diverse datasets in the public sector can benefit organizations attempting to fill information gaps, and more importantly, to solve complex public policy challenges. The utilization of disparate data, conflated into a repository can be viewed as an evolution from historical analysis towards a predictive analysis. Recognizing specific patterns and trends allow the decision makers to set strategic goals for future initiatives. Government entities, within a governance framework, must embrace advanced data analysis as a tool impacting present and future initiatives. Agencies can no longer operate in silos, but must be willing to collaborate and consolidate redundant data across the enterprise to ensure the benefits of real-time analytics.

Governments in all jurisdictions, from federal or state to local agencies, will run on an application-centric digital infrastructure in which everything — people, processes, things, and data — is connected and integrated using common architectures, interoperability and open standards. Program evaluation, resource utilization management, policy or contract compliance, and fraud detection are among the functional business areas enhanced and continuously monitored by analytics, which are conducted at all junctures of the service delivery network.

Open government data portals require effective information governance, privacy, confidentiality, and security protocols, as well as intuitive analytics and visualization tools to build public trust and confidence in the quality and value of open data. The growing volume and availability of open government data drive the formation of public data marketplaces, which provide enriched open data, data algorithms and linked data to create the next generation of smart city services. The demands on government in the digital era require data management and business analytics professionals to take specific action to enhance their data and analytics architecture, environment and approach in order to put data at the heart of the organization.

The volume, velocity, and variety generated by digitization of government require that technical professionals build the data management and analytics architecture to accommodate changing and varied data and analytics needs. Forward-minded government IT organizations will realize that their current rigid data architectures, and the data silos that make end-to-end service delivery impossible, will not scale to meet the needs of digital government. The environment must not only accommodate the traditional static, structured data, and analyses, but also allow for access to less well-defined data using more advanced, iterative analytical techniques.

IT Measurement | FY2016

State Data Centers

State agencies served	120
Batch jobs processed	1.6 Million +
Transactions processed	650 Million +
Online storage (Mainframe and Open Systems)	2.6 Petabytes
Offline tape storage	5.09 Petabytes
Growth last year - Virtual servers	Increased by 10.6%
Service Center requests processed	Average 365 per month
Service Center incidents resolved	Average 225 per month

Statewide Network

Growth (Number of end sites connected)	2700+
Types of circuits available	100+
Speeds of circuits available	64k - 10G
Internet (Cost per megabit)	$3.43/Mbps
Internet Capacity	18G
Internet availability	99.99%
Wide area network availability	99.99%
Wide area network average latency	37ms
Capital Complex network availability	99.99%
Capital Complex network average latency	<2ms
Average network device uptime	316 days

Statewide Telecommunications

Telephone lines	25,250
Voice mail services	6,478 Users
Centrex systems	65 Statewide
Grade of service for PBX/Centrex at P.01	99.99%
Toll free numbers	391
Toll free usage	14,588,063 minutes
Long distance usage processed	17,212,889 minutes
Audio/web conferencing accounts	400
Total number conference calls	45,612
Number of conferencing minutes	1,639,038
Telecommunications systems availability	99.99%

eGovernment

Website Launches	10
Service Launches	25
Mobile Application Downloads	49,900
Total E-Government Applications	143
Social Media Impressions	975,000+
National Awards	7
Online Transactions Processed	477,623

E-RATE

The Schools and Libraries Program (www.universalservice.org/sl) was established by Congress to help make advanced telecommunications affordable for the nation's kindergarten through grade 12 (K-12) schools and libraries. It provides discounts on the costs of eligible telecommunications services, Internet access, and internal connections ranging from 20% to 90%. The highest discounts go to the schools and libraries serving the most disadvantaged populations. The majority of E-Rate funds have gone to the most disadvantaged schools and libraries, where over 50% of the students in the district qualify for the National School Lunch Program.

During the 19 years of the E-Rate program, schools and libraries in Mississippi have received over $642 million dollars. The following table reflects the amount received by Mississippi by year.

Mississippi's E-Rate Funding	
2016*	$20,302,040.06
2015*	$23,738,805.30
2014	$27,303,092.79
2013	$29,272,336.84
2012	$35,361,810.36
2011	$37,045,632.10
2010	$34,082,604.44
2009	$35,396,434.76
2008	$34,537,855.88
2007	$32,370,376.22
2006	$35,042,013.48
2005	$41,289,131.02
2004	$43,341,949.85
2003	$38,546,627.10
2002	$33,546,801.21
2001	$34,459,775.11
2000	$29,559,630.69
1999	$32,765,886.15
1998	$24,225,723.06
Total	**$642,562,879.38**

Source: http://www.e-ratecentral.com/us/stateInformation.asp?state=MS
Note: Some funding requests remain under review.

MISSISSIPPI IT PLANNING CYCLE

The primary goal of the IT Planning Cycle is to improve the overall efficiency and effectiveness of information technology in state government. Investing scarce public resources in carefully selected IT projects offers significant benefits, including improved services delivery to the citizens and business of Mississippi. While planning is a prerequisite to the budget process and necessary for the procurement of information technology and services, an information technology plan (IT Plan) is the single most important ingredient to the effective use of technology in an agency.

The IT Planning Cycle has four components: Strategic Planning, Legislative and Budget, Technology Events, and Strategic Publications. These components are not necessarily sequential in all aspects but they are designed to overlap to assist state government in making wise technology investments.

Strategic Planning provides a method for determining how well technology is currently meeting the business needs of an agency and helps identify technology gaps that could improve agency performance and service. As stated in §25-53-5 (a) Mississippi Legislation requires all agencies of state government to submit an IT Plan to the Mississippi Department of Information Technology Services (ITS) each year. The due date for the IT Plan is in the first quarter of the fiscal year, which directly correlates to the agency budget submission in order to assist agencies in determining the resources needed for their technology initiatives. ITS provides a planning methodology to guide agencies through the planning process, as well as staff to assist agencies through their IT Plan development.

Once collected and reviewed, IT Plan information is compiled into reports that are evaluated for possible statewide infrastructure impact and needs, opportunities for agency collaboration, potential volume purchases, IT training and education opportunities, and other technology focus areas. The information is also used to prepare the *State of Mississippi Strategic Master Plan for Information Technology*. This report is presented to the Governor and Legislature annually to advise them concerning allocation of fiscal resources to best achieve statewide information resource management goals.

Funding for technology initiatives makes the **Legislative and Budget** component essential in the IT Planning Cycle. The Joint Legislative Budget Committee meets in September of each year to consider agency budget requests and state revenue estimates and budgets are approved the following April. Agencies are also required to submit a *Five Year Strategic Plan* in the first quarter of each fiscal year. In 2013, Legislative leadership tasked its members to reinvigorate performance budgeting in Mississippi by developing ways to better integrate agency planning and performance information into the appropriations process. Agencies must align the *Five Year Strategic Plan* submitted with their budget request to the statewide strategic planning elements as close as possible to create a unified statewide strategic plan.

The **Technology Events** component includes research, communication, and collaboration which make it the vital link to all other components in the IT Planning Cycle. ITS utilizes partnerships with leading IT research and advisory firms, government technology organizations, and vendor relationships to identify, analyze, and track new technologies or products that could benefit state government. On a national level, ITS participates in technology organizations such as the National Association of Chief Information Officers (NASCIO), the National Association of State Technology Directors (NASTD), and the Multi-State Information Sharing and Analysis Center (MS-

ISAC) and subscribes to Gartner, a leading knowledge broker to stay abreast of the latest advances in technology and to understand how other government entities are implementing them. In Mississippi, ITS serves with other state agency representatives on the Advisory Board for the Mississippi Digital Government Summit, annually hosts an ITS User Forum and Security Council meetings throughout the year to share knowledge with other state government agencies, boards, and commissions.

The key deliverable of the IT Planning Cycle is the **Strategic Publications** component. Information gathered from agency IT Plans is used to assist ITS in developing the goals and strategies as reflected in the *Strategic Master Plan for Information Technology*, and the *Five Year Strategic Plan*. The technologies, architecture, and services that are developed and implemented from ITS' goals and strategies are described in the *Technology Infrastructure and Architecture Plan* and the *ITS Services Catalog*.

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