



TN

Department of
**Finance &
Administration**

Strategic
Technology Solutions

STS ROADMAP FOR ARTIFICIAL INTELLIGENCE

Deploying and Managing Generative AI

Tennessee Department of Finance & Administration | June 2024



Contents

Introduction	3
STS's Role in Securing AI	4
Workstreams	5
Strategy	7
Use Case Portfolio	8
Architecture	9
Data Management	10
Implementation & Usage	11
Governance	12
Conclusion	13

Introduction

The State of Tennessee recognizes that as Generative Artificial Intelligence (Gen AI) technologies continue to evolve, it is imperative for the State to establish safe and effective usage. Throughout the remainder of this document Generative Artificial Intelligence will be referred to as Gen AI. The Department of Finance and Administration (F&A) and Strategic Technology Solutions (STS) are determined to address and manage risk in the underlying Gen AI as it relates to the broader goals and objectives of the enterprise. Developing a Gen AI roadmap is a critical imperative for state governments. While much of the underlying Gen AI technology and solutions are rapidly evolving, IT leaders must still plan (and replan) to support the changing environment. Part of this planning is in developing a Gen AI roadmap which will govern the State's deployment and management of Gen AI.

This roadmap is designed to promote the acceptable use of Gen AI solutions, by minimizing the potential for intentional or unintentional misuse, information security breaches and unethical use of Gen AI in State Government operations, in addition to creating a governance framework. Harnessing the benefits of Gen AI requires alignment with the Enterprise Information Security Policy for the State of Tennessee, and the National Institute of Standards and Technology (NIST) Artificial Intelligence Risk Management Framework (AI RMF 1.0).

Vision

The future use of Gen AI is intended to balance the interests of Tennessee State Government, by enabling and ensuring the appropriate, efficient, transparent, and ethical use.

STS's Role in Securing Gen AI

STS's Gen AI Roadmap and implementation of technologies will follow four strategic goals relevant to impacts by Gen AI:

Goal 1: Ensure Designate a leadership team responsible for overseeing Gen AI governance. This team will define the ethical principles that will guide the use of Gen AI within the state, including transparency, accountability, fairness, and safety. Develop guidelines and procedures for evaluating and mitigating bias in Gen AI solutions.

Goal 2: Protect Establish protocols for immediate response and mitigation in the event of harmful bias in Gen AI generated content. Implement robust cybersecurity measures to protect AI models from malicious attacks. Establish data collection, storage, and handling procedures that adhere to relevant data protection laws and regulations, based on data types. Ensure data used for training Gen AI models is collected with consent and privacy in mind.

Goal 3: Maintain Define a systematic process for developing and deploying Gen AI solutions and models. Implement safeguards to prevent the generation of harmful bias, or malicious content. Assign specific roles and responsibilities for various aspects of Gen AI governance, such as procurement, data management, model development, compliance, privacy, and security. Regularly review and update policies to ensure compliance with all relevant laws and regulations governing Gen AI and data privacy. Stay informed about changing legal and regulatory requirements.

Goal 4: Innovate Foster a culture of continuous improvement by regularly evaluating and updating governance practices, procedures, and policies. Provide training and education for staff involved in Gen AI to foster awareness of ethical considerations. Promote the hiring of staff with expertise in Gen AI.

Workstreams

This roadmap represents STS's work to unify and accelerate Gen AI's use across 6 workstreams:

Workstream 1 - Strategy: STS will define its ambitions in using Gen AI, STS will develop a Gen AI adoption strategy that supports our vision, incorporates enterprise-wide goals, and aligns with the Governor's operational priority around Investments that Transform Government. STS will evaluate it's overall readiness and potential impacts of implementing Gen AI solutions. STS will define success factors and principles for adoption.

Workstream 2 - Use Case Portfolio: STS will evaluate overall catalog of standard products and products exception for current Gen AI capabilities. STS will run use case workshops with both internal and external stakeholders to understand value creation. STS will engage with both consolidated and non-consolidated agencies and departments to evaluate value of using Gen AI in operations. All use cases will be compiled to evaluate best potential pilots of Gen AI solutions.

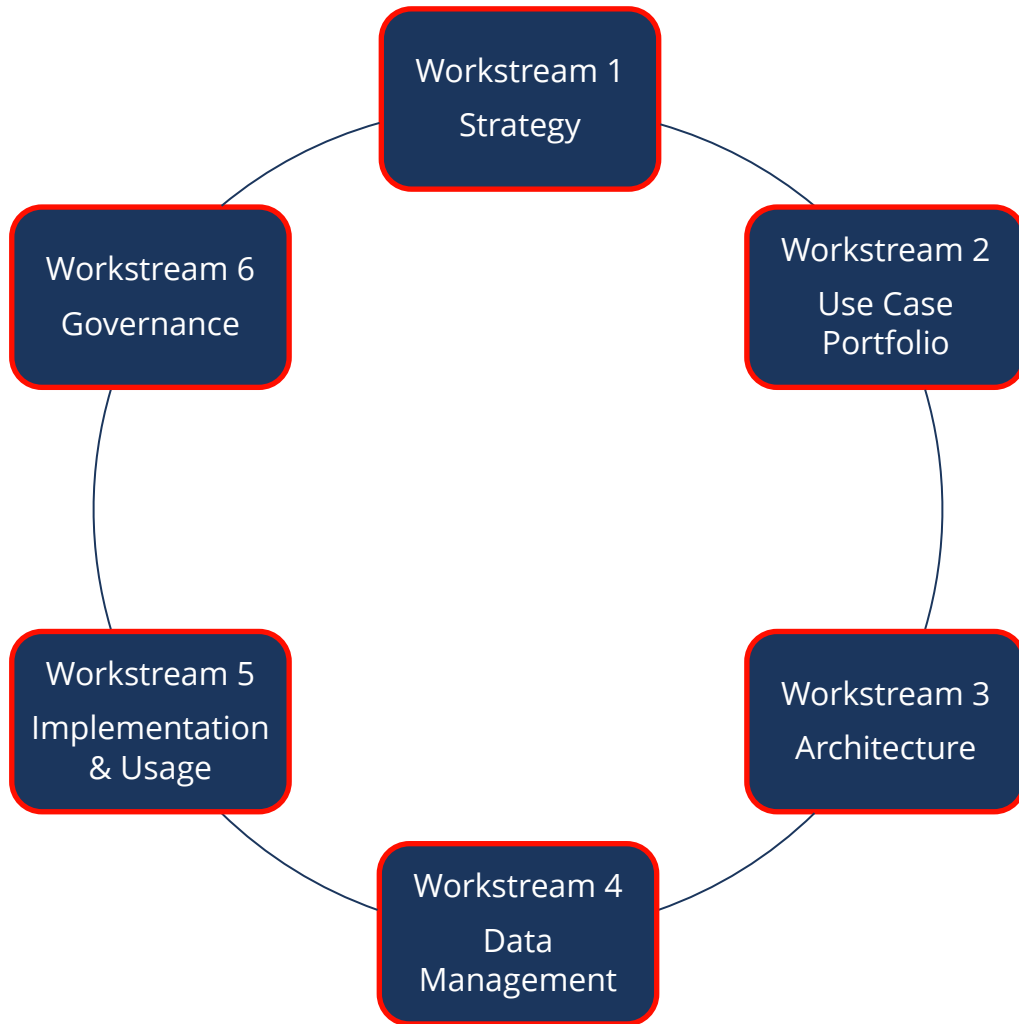
Workstream 3 - Architecture: STS will work with vendors and internal teams to evaluate a buy vs. build framework. A Gen AI reference architecture will be defined with a library of Gen AI design patterns. A vendor and application strategy will be developed to onboard applications with underlying Gen AI technology. Cost models will be developed for adoption of Gen AI applications.

Workstream 4 - Data Management: STS will identify data engineering needs to support the State's Gen AI strategy and create a data management framework to guide Gen AI deployment in alignment with enterprise policies around privacy and security.

Workstream 5 - Implementation & Usage: STS will work with all ongoing learning platforms the State has at its disposal to identify both basic and advanced Gen AI training for staff. External partners will also be leveraged to allow exposure to other Gen AI solutions and models for awareness. Gen AI guidelines will be distributed enterprise-wide with dos and don'ts related to Gen AI. Staffing needs for Gen AI expertise will be identified for hiring.

Workstream 6 - Governance: STS will set up a cross functional group to define principles and policies related to Gen AI. A Gen AI policy will be adopted by the Information Systems Council (ISC). Further Gen AI guidelines will be developed and distributed to both consolidated and non-consolidated agencies and departments for individual Gen AI policy creation. STS will audit and strengthen IP practices and protections. A Gen AI pilot for trust,

risk, and security will be performed. Ongoing governance and risk monitoring will take place and be updated periodically.



Workstream 1

Strategy

OUTCOMES

- GEN AI WORKGROUP DEVELOPMENT WITH SUBGROUPS AND DELIVERABLES
- ISC POLICY RELATED TO GEN AI
- RISK ASSESSMENT
- STANDING UP OF THE TN AI ADVISORY COUNCIL

STS will ensure that Gen AI adoption in the State is done in a methodical risk averse manner to harness the full benefit of these technologies to both internally and citizen facing.

Objective 1.1 STS will establish a Gen AI workgroup with membership from all three branches of government. The purpose of this workgroup will be to establish the current state of Tennessee State Government as it relates to Gen AI and the development of policies and governance of Gen AI.

Objective 1.2 The Gen AI workgroup will establish subgroups comprised of subject matter experts to focus on all major facets of Gen AI use and adoption. Subgroups will work with partners, both internal and external, to understand Gen AI across the industry and how best to proceed with best practices for Tennessee.

Objective 1.3 The Information Systems Council (ISC) is charged with overseeing all information technology for the State of Tennessee and will take recommendations from the Gen AI policy subgroup and adopt an Enterprise Generative Artificial Intelligence policy for the State.

Objective 1.4 The Gen AI workgroup will evaluate the State's current infrastructure and security protocols to protect against risks posed by Gen AI to the State's systems and networks.

Objective 1.5 STS and other members of the Gen AI workgroup will support the work of the TN Artificial Intelligence Advisory Council as it evaluates the effects of Gen AI on the state.

Objective 1.6 The Gen AI workgroup will assign specific components of this Gen AI strategy to members and begin implementing components of the strategy.

Workstream 2

Use Case Portfolio

OUTCOMES

- GEN AI WORKSHOPS WITH EXTERNAL VENDORS
- GEN AI USE CASE REGISTER CREATION
- ENGAGE BOTH CONSOLIDATED AND NON-CONSOLIDATED AGENCIES TO COMPILE USE CASES
- GEN AI PILOT PROGRAM

STS will evaluate current State applications and standard products for Gen AI capabilities. Engagement with business units will take place to explore value with potential Gen AI solutions both internally and customer facing.

Objective 2.1 A business value sub-group will be created under the overall Gen AI workgroup to begin evaluating both low-hanging fruit use cases and broad reaching high impact use cases for current applications begin used by the state and potential applications that could be used by the state.

Objective 2.2 The business value sub-group will engage with external vendor partners to run multiple Gen AI workshops to explore use cases that may be impactful to State operations.

Objective 2.3 A Gen AI use case register will be created to begin compiling potential use cases impacting State operations. A method for analysis and comparison will also be included in the use case register.

Objective 2.4 The business value sub-group will engage with both consolidated and non-consolidated State agencies to explore potential use cases from business units that could impact productivity and drive innovation.

Objective 2.5 The Gen AI workgroup will evaluate the use case register and identify potential Gen AI pilot programs.

Objective 2.6 A Gen AI pilot program will kickoff.

Objective 2.7 Evaluation of pilot program will take place and a outcomes and usage report will be created. The pilot program will then be evaluated for scalability.

Workstream 3

Architecture

OUTCOMES

- ARCHITECT TO VISION AND STRATEGY
- BUY VS BUILD
- MODEL DEVELOPMENT, TRAINING, AND PROMPT ENGINEERING
- RESILIENCY, SCALING, AND FLEXIBILITY
- FINOPS, LIFECYCLE MANAGEMENT, AND CONTINUOUS IMPROVEMENT

A well Architected Gen AI Solution will modernize TN Enterprise Technology Services, supporting diverse use cases and maximizing Gen AI value for Tennessee Government, and ultimately the Residents of Tennessee.

Objective 3.1 Vision and Strategy are two critical guardrails for architecting a Gen AI Solution for the State of Tennessee. Defining the architecture when partnering with vendors, learning their capability alongside the adherence to State standards is critical in ensuring requirements are met and use cases become achievable.

Objective 3.2 STS has adopted the strategy of leveraging managed service partners to provide robust technology solutions and services that our current staffing and employee skillset cannot facilitate. STS has acted as the service broker to State agencies in these cases and should persist with the Gen AI Solution.

Objective 3.3 Reusable artifacts and building blocks will be developed and cataloged for use within the Gen AI Platform, templating use case solutions. Model training and engineering will be critical per model and per use case to ensure that valid responses to data and interactions are meeting QA standards. This process will be necessary to existing models and new Gen AI model selection.

Objective 3.4 Scaling and flexibility of the Gen AI Platform will be instrumental as an enterprise service offering. The ability to adjust to business demands will be necessary. Maximum fault tolerance should be embedded in the design of the Gen AI Solution to minimize risk of downtime and promote a robust disaster recovery plan. A high density multi model approach to the Gen AI Solution will provide outstanding use case fulfillment.

Objective 3.5 The FinOps practice should be applied to the Gen AI Solution. This will ensure operational and fiscal efficiencies, while bringing cross functional ownership to the business, support, and budgeting groups. Gen AI Models should have the lifecycle management process applied and undergo continuous improvement efforts to better fulfill use case delivery.

Workstream 4

Data Management

OUTCOMES

- GEN AI DATA MANAGEMENT FRAMEWORK
- GEN AI DATA PRIVACY PROCEDURES
- GEN AI DATA SECURITY PROCEDURES
- GEN AI DATA QUALITY PROCEDURES
- GEN AI RISK MANAGEMENT AND COMPLIANCE PROCEDURES
- GEN AI DATA GOVERNANCE PROCEDURES
- GEN AI ETHICAL PROCEDURES

STS will ensure that the collection, storage, and use of data in support of the State's Gen AI strategy is managed in a holistic way that considers privacy, security, data quality, and ethics.

Objective 4.1 Support Governance subgroup as needed in the development of enterprise Gen AI policies and frameworks.

Objective 4.1 Develop a comprehensive data management framework that considers privacy, security, data quality, and ethics in support of the State's Gen AI strategy.

Objective 4.2 Develop and implement appropriate data privacy procedures and controls for Gen AI use case development in alignment with enterprise policies and frameworks and with applicable law.

Objective 4.3 Develop and implement appropriate data security procedures and controls, including incident response, for Gen AI use case development in alignment with enterprise policies and frameworks and with applicable law.

Objective 4.4 Develop and implement data quality procedures and controls for ensuring and maintaining the quality of data used in Gen AI models. These would cover aspects such as data accuracy, completeness, consistency, reliability, and timeliness.

Objective 4.5 Develop and implement risk management and compliance procedures and controls for Gen AI use case development in alignment with enterprise policies and frameworks and with applicable law.

Objective 4.6 Develop and implement data governance procedures and controls for Gen AI use case development in alignment with enterprise policies and frameworks and with applicable law.

Objective 4.7 Develop and implement ethical procedures and controls for Gen AI use case development in alignment with enterprise policies and frameworks and with applicable law.

Workstream 5

Implementation & Usage

OUTCOMES

- VERIFY POLICY COORDINATION
- RE-SKILL CURRENT STAFFING FOR CULTURAL SHIFT
- STAFFING PLAN FOR THE FUTURE IT ENVIRONMENT

Facilitate responsible and effective adoption and usage of Gen AI technologies by promoting AI literacy, managing cultural change, developing necessary skills, & fostering cross-functional collaboration

Objective 1.1 Verify that policy is guiding the successful implementation and usage of Gen AI technologies into state processes, services, and decision-making.

Objective 1.2 Identify and validate use cases while ensuring they enhance efficiency, accuracy, and State employee or citizen services.

Objective 1.3 Develop the skills and knowledge necessary for successful Gen AI adoption. This includes training staff and fostering collaboration, which plays a crucial role in managing the cultural shift that Gen AI adoption brings. This involves addressing concerns, dispelling myths, and encouraging a positive attitude toward AI.

Objective 1.5 Work with all ongoing learning platforms at the State's disposal to identify both basic and advanced Gen AI training for staff. External partners will also be leveraged to allow exposure to other AI tools and models for awareness. Gen AI guidelines will be distributed enterprise-wide with dos and don'ts related to Gen AI.

Objective 1.6 Build organizational capacity by creating centers of excellence, communities of practice, and knowledge-sharing platforms related to Gen AI.

Objective 1.7 Assess existing staff capabilities and support and recruitment of new talent as needed. This should include both technical (i.e., Gen AI pair programming) and non-technical training (i.e., Gen AI's impact on policy, laws, etc.).

Workstream 6

Governance

OUTCOMES

- Governance Protocols
- ENTERPRISE COMMUNICATION
- MONITORING OF AI USAGE
- AUDIT PLAN
- INNOVATION

Governance protocols are designed to promote the acceptable and responsible use of Gen AI tools that minimizes the potential for intentional or unintentional information security breaches, misuse of sensitive data, unethical decision-making and outcomes, and potential biases.

Objective 6.1 Develop policies that clarify appropriate use of data and AI models. Support Data Management subgroup as needed to ensure that Gen AI Data Management Framework aligns with enterprise policies and frameworks and with applicable law.

Objective 6.2 Publish and socialize across Enterprise Gen AI policy and governance framework across State Government. Engage with department and agency and leadership to encourage further understanding of Gen AI usage aligning with the published Enterprise Gen AI policy and the capacity to take accountability for their approach to Gen AI.

Objective 6.3 Develop security/IT strategy to monitor Gen AI usage including identifying risks. Develop and socialize compliance criteria and a plan to manage and remediate noncompliance with the Enterprise Gen AI policy.

Objective 6.4 Develop and socialize an audit plan to validate data being processed in Gen AI solution specific department and agency processes.

Objective 6.5 Define consequences for individuals or departments that do not adhere to the Gen AI governance framework.

Objective 6.6 Maintain comprehensive records of Gen AI model development, training, and deployment, including data sources and algorithms used.

Objective 6.7 Foster a culture of continuous improvement by regularly evaluating and updating governance practices, procedures, and policies.

Conclusion

As mentioned above Gen AI technologies and solutions continue to evolve at a rapid rate. This roadmap represents the framework the State will use to address the evolution in six specific areas or workstreams. The objectives identified in each workstream encompass the State's initial response to the extremely promising emergence of Gen AI. While the rate of change in this field will continue to increase, the State is only beginning to understand the use cases, risks, and business value that is being presented. This roadmap will continue evolve as understanding of how to responsibly deploy Gen AI for the enterprise in a way that takes full advantage of the technology while protecting the State's data with which STS is entrusted to do. To that end this roadmap will be revised on an annual basis to capture information available from technology assessments, use case analyses, proofs of concept, and benchmarking data from other states. The promise of Gen AI is significant, and STS owes it to the Tennessee citizenry to leverage these technologies responsibly. The STS Roadmap for Gen AI provides an outcome-based framework to maximize its value for the State of Tennessee.