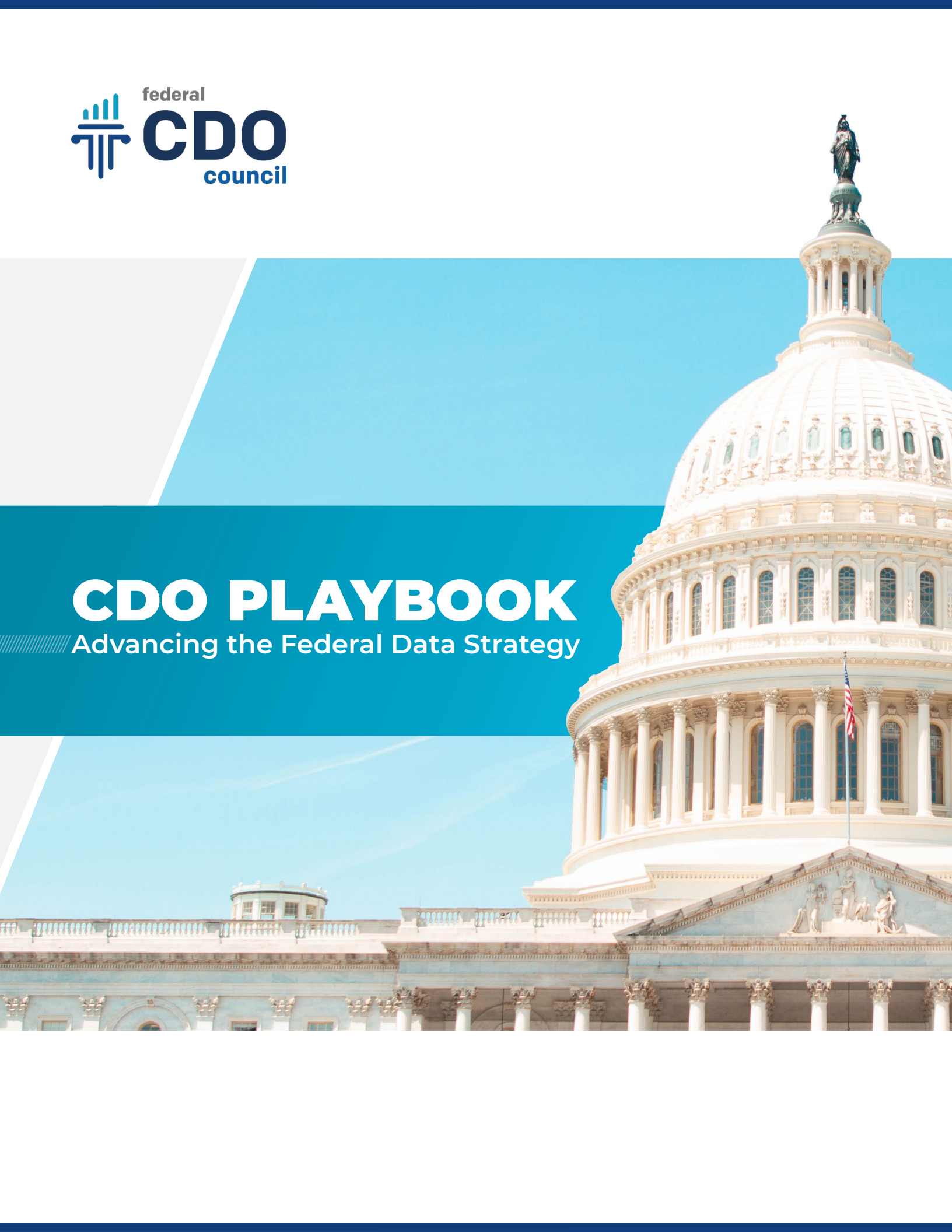# federal CDO council

CDO PLAYBOOK
Advancing the Federal Data Strategy

INTRODUCTION

The federal Chief Data Officer (CDO) position is a pivotal and transformational role that can significantly benefit the collection, organization, analysis and use of data in the agency as well as improve its value to society. The CDO must embrace the roles of change agent and evangelist to bring the inspirational vision of what data can do for all stakeholders.

CDOs must seize opportunities to leverage data as a strategic asset within their organization, otherwise, the CDO faces the risk of becoming a compliance driven position. The CDO should first focus on finding opportunities to promote the sharing and access of data within their agencies. They must build critical relationships and show value in the near-term through "quick wins," as data governance and master data management programs take longer to implement and demonstrate results. It is a hard job with a value proposition not consistently appreciated and with challenges that are critical to overcome to properly serve their stakeholders and the American people.

Federal agencies are at different points of their data journey. While some CDOs have data science teams that are leveraging advanced analytics to derive meaningful insights, others have little to no budget or staffing resources to carry out the initiatives that support their data vision and strategy. A 2020 Gartner survey shows 14% of CDOs have been in their roles for less than a year.[1] Many come into their role finding data silos throughout their agency, with data in disparate places and data functions mostly decentralized. CDO reporting and organizational structures also vary from agency to agency. Despite all this, CDOs must demonstrate early value generation, providing capabilities that build credibility and distinguish themselves as an executive far from the back office with a seat at the leadership table.

14% of CDOs Have Been in Their Roles for Less Than a Year
Tenure in current role

1 to less than 3 years **50%**
3 to less than 5 years **23%**
5 years and more **13%**
Less than a year **14%**
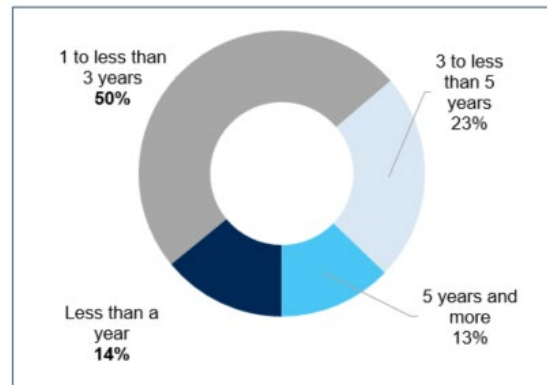
n = 469, All Respondents
D02. How long have you been in your current role?
Source: Gartner 2020 CDO Survey
ID: 20002

Gartner.

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[1] Gartner. CDO Agenda 2021: Influence and Impact of Successful CDOs in the Sixth Annual CDO Survey. March 2021.

Federal CDOs come into their role needing a wide array of skills. They must be data evangelists responsible for changing the agency culture to use data to solve real problems and to adopt enterprise data standards that improve overall data quality as a by-product. They must inspire agency offices to engage in a shared unified vision for data by demonstrating they are strategic thinkers who understand how data can drive better agency outcomes and be of greater value to society. Much like the Office of Personnel Management's (OPMs) five executive core qualifications (ECQs), it takes a variety of leadership skills, both hard and soft,[2] to build trusting relationships with key stakeholders and advance the mission of their agency.

According to federal CDOs, persons in this position must have the ability to:

- Communicate and translate complex concepts to all audiences
- Understand and prioritize organizational business challenges and deliver value in these areas
- Build and lead teams across the organization
- Remain goal oriented and focused on reaching specified objectives by establishing structure and managing towards outcomes
- Adapt and deal with different issues of importance to different customers
- Influence others to realize the mission value of data
- Manage change within organizations

The goal of this playbook is to help you be key value drivers as the federal government expands its use of data as a strategic asset.

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[2] See DOL's "Soft Skills: The Competitive" Edge for a list of example hard and soft skills
https://www.dol.gov/agencies/odep/publications/fact-sheets/soft-skills-the-competitive-edge)

ABOUT THIS PLAYBOOK

The CDO Playbook is an iterative document that explores and defines the evolution of the federal CDO role. It provides new and existing CDOs with guiding principles, opportunities for quick wins, and best practices to navigate some of the key areas that CDOs should focus on today and over the next few years.

The CDO Council's Data Skills Working Group (WG) created this playbook of four key "plays" which draws from successful practices in both industry and government. It is advice from CDOs to other CDOs, hence you will notice the informal tone and admonitions of what 'you' should consider. It leverages and cites concrete examples from federal CDOs on how they have applied specific strategies and approaches to make progress in each play to deliver value in this evolving role as a change management leader.

To prepare this playbook, a small working group of CDOs from both large and small agencies participated in discovery meetings to understand how they define their role based on each of their experiences. Their successes, agency culture, pain points, and understanding of data management were assessed to recommend and agree on the four key plays. There is no one-size-fits all approach to the strategies a CDO will execute against these plays and no specific starting point. They are highly interrelated an`d are not prescribed in any order, instead quick wins to demonstrate value are possible from any point throughout all the plays. The information provided unearthed commonalities among people, process, technology, and data distinctions prevalent in many agencies. This playbook is meant to be illustrative and insightful for recognizing value-based opportunities for any agency.

THE PLAYS

PLAY #1

Cultivate strong relationships to partner on solving mission problems with data.

PLAY #2

Promote data sharing and break organizational silos.

PLAY #3

Build a data-driven culture by taking the lead to improve data literacy and acumen within your agency.

PLAY #4

Drive transformation through a mission focused data and analytics strategy that can influence the enterprise-wide business strategy and answer key agency questions.

Cultivate strong relationships to partner on solving mission problems with data.

Establish partnerships to realize quick wins - CDOs are most successful when they engage and influence key stakeholders. Your stakeholder engagement strategy should focus on forging relationships before zeroing in on data governance activities that may risk appearing solely compliance driven.

♟ KEY STRATEGIC ACTIONS

1.1 **Identify your key stakeholders** and learn how best to engage them in problem solving through collaborative working relationships.

1.2 **Engage IT decision makers** to build partnerships around data priorities.

1.3 **Partner with stakeholders** from across agency offices to collaborate on pilot projects that solve specific business problems.

1.4 CDOs should **work with executive stakeholders** to demonstrate how data and analytics initiatives **address agency challenges.**

1.5 **Continuously engage with decision-making executives** and other key stakeholders to continue value proposition discussions and the value of data. Agency-wide representation and support gives a broader lens to the organizational drivers and constraints needed to make data-related decisions.

1.6 **Communicate to your entire workforce** the progress, successes from your quick wins, and plans for building and delivering long-term capabilities for the agency.

1.1 **Identify your key stakeholders** and learn how best to engage them in problem solving through collaborative working relationships.

KEY ACTIVITIES

- **Conduct a stakeholder analysis** starting with leadership, then moving to agency or sub-agency offices. Key stakeholders should include a variety of levels of data expertise including agency data stewards with expertise in working with data as well as offices unaware of their data capabilities.

- **Interview stakeholders** to identify their mission needs and challenges. Give them opportunities to voice their interests and priorities. Some example interview topics include priority questions, as well as data needs, acumen, access gaps, and opportunities, etc.

- **Use stakeholder needs to guide decisions** about how to remove any relevant organizational obstacles related to data goals and identify potential project opportunities.

COMMON PITFALLS

- Do not just start with data governance for the sake of data governance, partner on key questions to drive value. CDOs can improve data governance and data quality as needed to meet agency goals.

1.2 Engage IT decision makers to build partnerships around data priorities.

KEY ACTIVITIES

- **Actively engage with key IT partners** to collaborate on planned IT projects where data transformation opportunities exist or to gain access to IT environments and tools needed for future data projects.

- **Develop understanding** of the relationship between CDOs and Chief Information Officer (CIO) even where there is no direct reporting relationship.

- **Cultivate consensus** with the CIO and other leaders on shared priorities. This common understanding is significant because of the interdependent nature of the two roles.

- **Build coalitions with key IT partners** to seamlessly integrate into the IT investment and governance processes within your agency. IT and data priorities are connected and often share interdependent goals of generating increased business value.

- **Ensure you are aware** of the types of planned and current IT investments and projects to prioritize key data activities. This strategic relationship building tactic demonstrates your ability to develop meaningful partnerships.

1.3 Partner with stakeholders from across agency offices to collaborate on pilot projects that solve specific business problems.

Successful small-scale projects or "quick wins" build the credibility needed to support longer-term goals.

KEY ACTIVITIES

- **Deliver solutions** quickly and communicate wins to demonstrate value to your agency to increase support and buy-in for your data vision.

- **Plan pilot projects** such as data prototyping opportunities with interested agency offices to achieve fast results to make the case for data investment to executives.

- **Focus on the "What's In It For Me" (WIIFM)** by having value conversations and asking if stakeholders see additional business opportunities so you can further ideate on solutions leveraging analytics capabilities.

AGENCY EXAMPLE

- The CDO at the U.S. Department of Agriculture (USDA) developed Human Resources (HR) dashboards with consistent information data collected from 19 different component agencies. This quick win initiative demonstrated labor savings by moving away from siloed approaches, which ultimately led to confidence for more data projects and deployments in other mission areas.

1.4 CDOs should **work with executive stakeholders** to demonstrate how data and analytics initiatives **address agency challenges.**

KEY ACTIVITIES

- **Conduct targeted discussions** with key executive stakeholders to obtain their buy-in for your proposed data priorities and high-impact solutions.

- **Identify and prioritize** solutions to your agency's data challenges which connect to agency mission goals and manage time and risk.

- **Implement foundational initiatives,** for example, developing data definitions and standards or more focused use cases to build more capabilities over time.

- **Review lessons learned** from previous pilot projects to factor into your plans.

1.5 Continuously engage with decision-making executives and other key stakeholders to continue value proposition discussions and the value of data. Agency-wide representation and support gives a broader lens to the organizational drivers and constraints needed to make data-related decisions.

KEY ACTIVITIES

- **Ensure executive sponsorship** and support for your data priorities to build momentum and encourage investment to address data issues throughout your organization.

- **Conduct strategic discussions** with a stated purpose and desired outcome, whether it is to inform, gain support, or ask for funding.

1.6 Communicate to your entire workforce the progress, successes from your quick wins, and plans for building and delivering long-term capabilities for the agency.

KEY ACTIVITIES

- **Build organizational awareness** through agency-wide communication that keeps employees interested in your agency's data transformation journey.

- **Effectively communicate** about data transformations, how to get involved, and share tools are available to build awareness and trust.

- **Anticipate questions** from stakeholders on the value of working with the CDO.

PLAY 1 LESSON LEARNED

- **Identify data champions** throughout the agency who demonstrate how they are leveraging data for better decision-making and improving overall data quality for their programs.

- **Prioritize the data analytics community** as a key stakeholder, learn and understand their needs and identify ways to meet them.

PLAY 1 HELPFUL RESOURCE

- Example, TBM Training Module on Stakeholder Engagement

Promote data sharing and break organizational silos.

Effective data management enables data sharing and access across the enterprise which can eliminate data redundancies and lead to overall improved data quality and provide better services. Additionally, data analytics and emerging technologies are dependent on having strong and acceptable data management functions in place, so you have quality data with which to work. The CDO role is to break down organizational silos to foster better transparency and collaboration into the data needed to succeed in transformation projects.

♟ KEY STRATEGIC ACTIONS

2.1 Collaborate with your CIO Office, statistical official, and evaluation officer (if present in your agency) to **understand the history of your agency's data and infrastructure maturity.**

2.2 Identify a strategy to optimally **organize and assign data stewards** across the enterprise.

2.3 Provide opportunities to **train and empower data stewards** to be effective in their role.

2.4 Establish an automated means to **manage stewardship responsibilities.**

2.5 Collaborate with data stewards to **develop data lifecycle management best practices.** The OPEN Government Data Act mandates that CDOs establish data management best practices to improve the quality of agency data.

2.6 **Determine how your data management program will be organized.** The data management domains of your program will serve as inputs to your data management strategy (see next step).

2.7 **Develop a data management strategy** in collaboration with your CIO, Chief Technology Officer (CTO), Chief Enterprise Architect or Chief Data Architect, and agency leadership, based on the findings and inputs from earlier action steps. A data management strategy will help you think through how to prioritize investments and resource allocations (e.g., data analytics, data infrastructure).

2.8 **Develop an Organizational Change Management (OCM) plan to support your data management strategy.** Integrating change management strategies can successfully persuade stakeholders to implement or adjust data management methods or practices.

2.9 **Prioritize data sharing projects** that generate measurable business outcomes and align with strategic objectives. Using an incremental approach to data management not only delivers benefits to impacted business stakeholders but it also helps you gain quick wins.

2.10 Collaborate with data stewards to **develop common business language,** such as data term definitions for metadata. Managing metadata vocabularies, formats, and standards ensures a common understanding across the agency of data meaning and its uses.

2.11 **Identify data consolidation opportunities** across database systems including data sharing and access between business lines. Evaluating data management and analytics capabilities can help you identify open source or shared service opportunities across systems to improve cost efficiency.

2.12 Design a conceptual target data architecture and enterprise solution for databases and other data platforms creating an environment to establish formal data standards. Establishing a target data architecture brings your strategy and the technology side together to show the relationships between your agency's data functions, technologies, and types.

2.13 Begin data aggregation activities for data consolidation, integration, and service projects. This action ensures you have compiled and processed all the data from different databases needed for your data projects.

2.14 Define and track performance metrics across your data management program functions and monitor overall progress toward them. The information collected provides feedback and inputs into your data management strategy.

2.15 Routinely **assess all agency data management tools and technologies** (e.g., data analytics capabilities) including Operations and Maintenance (O&M) costs for efficiencies. With the evolution of data tools, it is important to constantly evaluate your existing resources to determine where cost savings opportunities are.

2.1 Collaborate with your CIO Office, statistical official, and evaluation officer (if present in your agency) to **understand the history of your agency's data and infrastructure maturity.**

KEY ACTIVITIES

- **Build in-depth knowledge** of the agency's data history and infrastructure maturity.
- **Gain familiarity with the business** cases for the agency's planned investments to understand context and set expectations before engaging with individual agency offices.
- **Conduct knowledge transfer meetings** to help uncover operational silos and determine data sharing needs of stakeholders who perform data management functions. Gather available documentation on existing data systems and their IT environments (e.g., the IT infrastructure).

2.2 Identify a strategy to optimally **organize and assign data stewards** across the enterprise.

KEY ACTIVITIES

- **Implement a data stewardship model** to break silos across agency offices and create partnerships between the CDO and agency offices as well as amongst data stewards themselves.
- **Organize stewards** across your organization to establish accountability and responsibility for the processes that ensure effective control and use of data. As defined in Play #1, first identify all the data stewards across various business lines performing data management and analytics functions.
- **Engage** with these stakeholders to build consensus on a standard set of core principles and clear expectations of stewards.

2.3 Provide opportunities to **train and empower data stewards** to be effective in their role.

KEY ACTIVITIES

- **Facilitate cross-sharing** of best practices for data usage by having meetings with informal data stewards to discuss the activities they perform in managing their data.

- **Work iteratively with informal data stewards** to develop a stewardship framework based on their input and feedback, and gain consensus on their role (e.g., tracking data inventories and collections.

- **Coordinate with data stewards** to identify the linkages needed between datasets, and to lead cross organizational projects. This type of framework empowers data stewards by considering their needs and opinions and fosters knowledge sharing.

2.4 Establish an automated means to **manage stewardship responsibilities.**

KEY ACTIVITIES

- **Gain additional insights across silos** of operations and support any future data standardization projects.

- **Document all existing data assets** to show the value of agency data.

- **Engage with data stewards** to obtain and document business requirements and use cases for their data systems.

- **Obtain relevant metadata** and classify the types of data being collected, used, and stored which will require an automated means for stewards to interface and accumulate such data. Be sure to provide guidance for sharing and/or obfuscating/tokenizing sensitive data. Developing a metadata inventory is important for building trust and enabling data sharing.

2.5 Collaborate with data stewards to **develop data lifecycle management best practices.** The OPEN Government Data Act mandates that CDOs establish data management best practices to improve the quality of agency data.

KEY ACTIVITIES

- **Implement a data management program** to develop decision making policies and procedures.

- **Build agency capacity** to establish formal data management policies and standards on implemented data assets.

- **Raise agency data awareness** early by developing best practices for managing **agency data in partnership with data stewards.**

- **Develop initial data standards** on the representation of data to educate agency stakeholders about the value of data management, standards, architecture, and data driven decision making.

AGENCY EXAMPLE

- The CDO at the U.S. Food and Drug Administration (FDA) created a steering committee and separate working groups both staffed by various FDA Center employees to identify data initiatives and come to consensus on recommendations for their organization. Using this approach created a process that creates a sense of ownership for data stewards, involving them in the decision-making which has led to stronger partnerships with the CDO.

2.6 **Determine how your data management program will be organized.** The data management domains of your program will serve as inputs to your data management strategy (see next step).

KEY ACTIVITIES

- **Create a data management framework** connecting your agency's data management program to the needs of your stakeholders.

- **Include senior leadership** and the agency data analytics community as stakeholders so that data management can best inform analytics.

- **Implement data management frameworks** which include specific disciplines, policies, and competencies that are applied throughout the data lifecycle.

2.7 Develop a data management strategy in collaboration with your CIO, Chief Technology Officer (CTO), Chief Enterprise Architect or Chief Data Architect, and agency leadership, based on the findings and inputs from earlier action steps. A data management strategy will help you think through how to prioritize investments and resource allocations (e.g., data analytics, data infrastructure).

KEY ACTIVITIES

- **Implement your data priorities** with a focused data management strategy that includes iterative approaches to addressing the various challenges of enterprise data management.

- **Consider including collaborative activities** and incremental data projects.

- **Align your agency's IT strategy** and modernization initiatives to the data management strategy to ensure IT and data are coordinated.

- **Explain how data analytics fits** into your strategy.

2.8 Develop an Organizational Change Management (OCM) plan to support your data management strategy. Integrating change management strategies can successfully persuade stakeholders to implement or adjust data management methods or practices.

KEY ACTIVITIES

- Most importantly, **engage** senior and executive leadership from across business lines to garner support for your enterprise data management vision which ensures you have the backing from across the organization.

- **Develop an OCM coupled with project management** and system engineering approaches to drive successful, large-scale transformations (e.g., IT or data modernization, workforce strategy, and policy changes).

- **Integrate OCM strategies into data projects** to advance strategic relations, increase teamwork and stakeholder buy-in, reduce the risk of customer resistance, and enable operations to be more efficient in achieving the full value of an initiative.

- **Assess your agency's culture** to better understand which key stakeholders need to be involved in your data management initiatives and what methods will be effective in implementing them.

- **Include consistent and ongoing communications** tactics for any desired data initiatives to help stakeholders understand why they should adapt to new changes.

2.9 Prioritize data sharing projects that generate measurable business outcomes and align with strategic objectives. Using an incremental approach to data management not only delivers benefits to impacted business stakeholders but it also helps you gain quick wins.

KEY ACTIVITIES

- **Prioritize high-value impact projects,** such as those at the management or secretary level, and leverage opportunities for data standardization and integration during planned IT projects.

- **Execute against your OCM plan,** including communicating any upcoming and major milestones of your planned data projects to key stakeholders.

AGENCY EXAMPLE

- The CDO at the Nuclear Regulatory Commission (NRC) built a master data management system for a very complex project collecting information required to determine the fee base for their regulatory service licensees. To become more transparent to their customers, they wanted to bring data from all lines of businesses throughout the agency to be granular enough to identify charges. The CDO identified data stewards from each of the offices that manage their own systems to collaborate on this project and share their data into this master data management system.

2.10 Collaborate with data stewards to **develop common business language,** such as data term definitions for metadata. Managing metadata vocabularies, formats, and standards ensures a common understanding across the agency of data meaning and its uses.

KEY ACTIVITIES

- **Establish strong metadata tags** on data assets helps you find and manage data effectively.

- **Leverage relationships with data stewards** to participate in these foundational data standardization efforts. This activity also supports data cleansing efforts for any forthcoming data projects.

2.11 **Identify data consolidation opportunities** across database systems including data sharing and access between business lines. Evaluating data management and analytics capabilities can help you identify open source or shared service opportunities across systems to improve cost efficiency.

KEY ACTIVITIES

- **Collaborate with data stewards** to identify organizational silos throughout your agency, which can uncover redundancies and overlapping data in systems, tools, and processes.

- **Assess data tool usage and costs** across the agency. Individual agency offices may be applying data analytics into their respective programs; therefore, it is imperative to assess current agency data tools including their licensing costs.

2.12 **Design a conceptual target data architecture** and enterprise solution for databases and other data platforms creating an environment to establish formal data standards. Establishing a target data architecture brings your strategy and the technology side together to show the relationships between your agency's data functions, technologies, and types.

KEY ACTIVITIES

- **Use your target data architecture** to provide the infrastructure to share or migrate data from where it is stored to where it can be analyzed. This data structure should include an infrastructure for a high-functioning analytical environment.

- **Create a solution** that solves the needs of different stakeholders and leverages data as an organizational asset, to discourage agency data silos. An enterprise solution may also lower IT costs.

2.13 **Begin data aggregation activities** for data consolidation, integration, and service projects. This action ensures you have compiled and processed all the data from different databases needed for your data projects.

KEY ACTIVITIES

- **Implement enterprise data solutions** will require gathering data from disparate sources within your agency and making sure you have high quality information data.

- **Consider data aggregation as a tool** in all initiatives and projects. This means you need good extract, transform and load (ETL) capabilities, a necessary process for you to optimize your data for analytics.

2.14 **Define and track performance metrics** across your data management program functions and monitor overall progress toward them. The information collected provides feedback and inputs into your data management strategy.

KEY ACTIVITIES

- **Link your data management performance** metrics to specific business performance metrics.

- **Design your data management program** to drive or meet business outcomes. This means tracing business outcomes back to supporting analytics output and underlying data.

2.15 Routinely **assess all agency data management tools and technologies** (e.g., data analytics capabilities) including Operations and Maintenance (O&M) costs for efficiencies. With the evolution of data tools, it is important to constantly evaluate your existing resources to determine where cost savings opportunities are.

KEY ACTIVITIES

- **Implement and maintain data management investments,** a key role of the CDO.

- **Use your budgeting and data resource management process** to show how you are prioritizing resources to meet agency needs.

PLAY 2 LESSONS LEARNED

- **Leverage a data stewardship framework** to create a stronger partnership with data stewards and increase their participation in data initiatives for the agency.

- **Identify ways to get as much done as possible early on,** especially in areas of collaboration with data stewards. Holding meetings is not enough. To continually promote participation and buy-in to your data management initiatives, you must demonstrate near-term value.

PLAY 2 RESOURCES

- **Federal Data Strategy Data Ethics Framework**

- **GSA guide to Inventory.data.gov**

- **International Data Standards**
  - » ISO
  - » United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT)
  - » W3C The World Wide Web Consortium
  - » IETF The Internet Engineering Task Force

- **US National Data Standards**
  - » American National Standards Institute (ANSI
  - » International Committee for Information Technology Standards (INCITS)

- **US Federal Government Data Standards**
  - » The Federal Geographic Data Committee (FGDC)
  - » The National Information Exchange Model (NIEM)

- **Additional Data Standards** from resources.data.gov

- **Sample Technology Business Management (TMB) OCM Guide and Toolkit**

Build a data-driven culture by taking the lead to improve data literacy and acumen within your agency.

Invest in the individuals within your workforce to create a data-driven culture by improving data literacy and skills. Focus on providing an inclusive approach to building and harnessing basic data skills, knowledge, and competencies in all staff and leadership. Additionally, part of your OCM plan should include strategies for transforming the overall agency culture by getting your workforce to understand the mission value that data can deliver.

♖ KEY STRATEGIC ACTIONS

3.1 Conduct a landscape analysis to **document existing training requirements** and **identify available training opportunities** within your agency and across the federal government that your agency may be able to utilize. Consult the Federal Data Strategy's Curated Data Skills Catalog in this process. Use existing training resources as a cost-effective approach to training implementation and to leverage potential shared service opportunities across the federal government.

3.2 **Build an education and awareness campaign** that focuses on communicating the importance and value of data throughout the organization while promoting data literacy. This OCM activity demonstrates your ability to be a change agent, influencing your agency data culture.

3.3 **Review or update your workforce skills assessment** to understand the coverage, quality, methods, and effectiveness of current staff data literacy and data skills. This step identifies where existing gaps in data literacy and specific data skills are and where additional training might be needed.

3.4 Collaborate with key stakeholder groups, including your HR Office, to **create a list of key data skills** that are pertinent to your agency's success. Use this list to **develop a training plan that prioritizes these key data skills** and links these efforts to your mission goals and objectives.

3.5 Connect with your HR office to **develop a training roadmap** that includes current and future training needs.

3.6 Determine the resources needed to **implement your training and submit a budget request** for those needs (e.g., training instructors or training software).

3.7 **Consider the type of implementation** that works best for your agency, whether that is a pilot program or a comprehensive training program.

3.8 **Develop a communications plan** to deliver strategic messages to your workforce about your planned data literacy initiatives.

3.9 Coordinate with your agency CHCO and agency CIO to **determine crossovers in data and information-focused positions.**

3.10 Engage with stakeholder groups to **learn about previous and current data and information technology-related hiring needs and plans** across agency offices. Understanding your agency's hiring, attrition, and turnover trends will help in identifying effective strategies and approaches for future hiring plans.

3.11 **Develop a hiring plan for future roles needed to fill skill gaps** for your organization or carry out CDO mandates and Office of Management & Budget (OMB) requirements.

3.12 **Assess and measure the mission value** gained from data literacy efforts.

3.1 Conduct a landscape analysis to **document existing training requirements** and **identify available training opportunities** within your agency and across the federal government that your agency may be able to utilize. Consult the Federal Data Strategy's Curated Data Skills Catalog in this process. Use existing training resources as a cost-effective approach to training implementation and to leverage potential shared service opportunities across the federal government.

KEY ACTIVITIES

- **Connect with your HR office to learn about efforts taking place** at the Office of Personnel Management (OPM) and across government regarding the data space (e.g., government-wide data science training programs, establishing data science job descriptions, etc.).

- **Coordinate with your agency's CIO, Chief Learning Officer, and Chief Evaluation Officer** to learn about parallel efforts taking place with regards to training and hiring both within the agency and through their respective cross-agency council groups.

- **Ensure there is alignment between the technology, evidence, and data sides** as there may be similar requirements and goals where opportunities for collaborative synergies exist.

3.2 **Build an education and awareness campaign** that focuses on communicating the importance and value of data throughout the organization while promoting data literacy. This OCM activity demonstrates your ability to be a change agent, influencing your agency data culture.

KEY ACTIVITIES

- **Cultivate buy-in and interest** in your data vision among key stakeholders through awareness campaigns that build broader consensus on your agency's future.

- **Communicate the value of data as a strategic asset and garner excitement** from agency offices for product or service development opportunities to use data to respond to mission needs.

- **Focus your awareness campaign on the goal of educating** your agency's workforce on data literacy.

AGENCY EXAMPLE

The CDO at the Federal Energy Regulatory Commission (FERC) facilitated meetings to demonstrate data product prototypes and basic data analytics visualizations and dashboards as an engagement strategy. These meetings showed key stakeholders' how programs were using data for better decision-making. This effort models data stewardship that facilitates improved data quality, which can lead to more trusted data products.

3.3 **Review or update your workforce skills assessment** to understand the coverage, quality, methods, and effectiveness of current staff data literacy and data skills. This step locates existing gaps in data literacy and specific data skills and where additional training might be needed.

KEY ACTIVITIES

- **Interview internal stakeholders across senior levels and job functions** (e.g., operations, human resources, program management) to identify existing gaps in data literacy and specific data skills, as well as where additional training might be needed.

- **Carefully decide how best to address the gaps in your agency** (i.e., training or hiring or both) by aligning to the needs of your staff and to your agency mission needs and priorities.

- **Evaluate the readiness of agency offices to integrate data science and data analytics into their missions,** especially those offices that may not have had that experience previously.

The CDO at the Department of Housing and Urban Development (HUD) assessed existing job positions as part of their agency's capacity assessment to determine whether job titles and responsibilities were aligned and that job with data analyst titles were in fact performing data-focused functions. The information gleaned from this assessment served as inputs into their budget requests and hiring plans.

3.4 Collaborate with key stakeholder groups, including your HR Office, to **create a list of key data skills** that are pertinent to your agency's success. Use this list to **develop a training plan that prioritizes these key data skills** and links these efforts to your mission goals and objectives.

KEY ACTIVITIES

- **Document a training plan** that connects to your broader, agency-wide business goals and objectives to create a more cohesive data literacy effort.
- **Demonstrate exactly how data literacy training provides value** and will progress your organization past its current state.
- **Create a plan which considers the current potential of your agency** and what type of training format and option will best develop data literacy skills (e.g., upskill, reskill, etc.).

3.5 Connect with your HR office to **develop a training roadmap** that includes current and future training needs.

KEY ACTIVITIES

- **Create a training roadmap** clearly outlining the main activities to progress your agency's data literacy.
- **Use the roadmap** to provide your organization with a linear timeline of events which connects to the main implementation activities in your training plan.

- **Document** exactly when each major milestone will take place.

3.6 Determine the resources needed to **implement your training and submit a budget request** for those needs (e.g., training instructors or training software).

KEY ACTIVITIES

- **Identify the necessary resources to fill identified agency gaps.** This activity allows your agency to plan and solve potential roadblocks in the future.
- **Meticulously account for resources** that you might not need immediately but may be required to sustain your training into the future.

3.7 **Consider the type of implementation** that works best for your agency, whether that is a pilot program or a comprehensive training program.

KEY ACTIVITIES

- **Strategize on the proper requirements and training format** prepares you to launch your data literacy training program.
- **Consider conducting a pilot program** to test out your program including the courses and instructors to see if they are a good fit for your agency's needs. **Note:** for those agencies that have a mature understanding of their data skills gaps, implementing a broad-scale program might be more appropriate.

3.8 **Develop a communications plan** to deliver strategic messages to your workforce about your planned data literacy initiatives.

KEY ACTIVITIES

- **Build a strong data culture by influencing individuals** within your workforce and relaying a narrative for data literacy, while highlighting the business value your initiative will bring.

- **Include communications** which explain how data and analytics can support agency offices and their business outcomes. This can include informational presentations or internal resources and guides breaking down key data science concepts.

3.9 Coordinate with your agency CHCO and agency CIO to **determine crossovers in data and information-focused positions.**

KEY ACTIVITIES

- **Identify complementary roles** between the CIO and CDO functions to potentially address immediate staffing needs.

- **Consider** that agency program officers, or the CIO may have an active or future strategy to implement data analytics or emerging technologies (Robotic Process Automation (RPA), Artificial Intelligence (AI), and Machine Learning (ML)) which could mean plans to hire for those positions. There may be existing data or information-focused positions that also support CDO requirements and priorities.

- **Connect with your CIO and Program office Directors** to determine if there are existing or future positions that could be reorganized and better aligned to the office of the CDO.

3.10 Engage with stakeholder groups to **learn about previous and current data and information technology-related hiring needs and plans** across agency offices. Understanding your agency's hiring, attrition, and turnover trends will help in identifying effective strategies and approaches for future hiring plans.

KEY ACTIVITIES

- **Consult key stakeholders** about existing hiring plans to integrate data roles into their programs and develop a cohesive approach on how these new roles will move the agency to become a more data driven organization.

- **Demonstrate your ability** to elicit change by integrating your data vision into individual program plans.

3.11 **Develop a hiring plan for future roles needed to fill skill gaps** for your organization or carry out CDO mandates and Office of Management & Budget (OMB) requirements.

KEY ACTIVITIES

- **Identify your staffing needs** early will aid in building a diverse and skilled team/workforce that can transform the organizational data culture.

- **Use staffing to create the right environment** for future resources to be successful.

- **Determine what kind of data workforce you need** to build, consider the key functional skill areas that will help address agency objectives.

- **Consider the type of data assets** you want to establish for the organization, including data and analytics methods and processes you want to employ, and tools you can provide.

- **Incorporate the results of your benchmarking assessments** as you develop your hiring plan. Consider all funding mechanisms both inside and outside of your agency including the requirements for leveraging a Working Capital Fund (WCF) to plan the budget for these staffing resources.

3.12 **Assess and measure the mission value** gained from data literacy efforts.

KEY ACTIVITIES

- **Demonstrate the measurable impact** of your data literacy initiatives on your organization's bottom line.

- **Work with your HR Office to develop assessments** to monitor the results of your data literacy initiative within the workforce.

- **Create metrics to measure progress** of data literacy training programs and connect those metrics to your agency mission objectives and larger strategic goals.

PLAY 3 RESOURCES

- CDO Council Inter-Agency Forum, contact cdocstaff@gsa.gov for more information
- Data Skills Training Program Case Studies
- Data Skills Training Program Implementation Toolkit

Drive transformation through a mission focused data and analytics strategy that can influence the enterprise-wide business strategy and answer key agency questions.

Focus on mission value creation and Key Performance Indicators (KPIs) to develop a modern data and analytics strategy that delivers tangible outcomes and value in the immediate and long-term while accounting for organizational, cultural, and technical constraints. A holistic data and analytics strategy also properly plans for budget and resource allocations for mission critical needs. Connecting mission value to your data specific investments and identifying resources that will allow your organization to maximize data for decision making and mission enabling purposes, will help move your organization forward even with a limited budget. Make sure your agency's data and analytics strategy is more than just complementary to your agency's mission and enterprise-wide business strategy. Your data strategy should focus on how to transform the organization and in turn influence and transform your mission objectives and business strategy.

KEY STRATEGIC ACTIONS

4.1 **Focus on use cases, pain points, and transformation/innovation opportunities** when interviewing key stakeholders to assess your agency's current data landscape. This assessment will present where the existing data sources and silos are and opportunities for data to accelerate change and improve existing KPIs.

4.2 **Identify any shared goals, consistent themes, and parallel findings** from the stakeholder interviews.

4.3 **Understand your agency's budget process** including the IT investment management processes to ensure that appropriate resources are planned for in future budgets as required under the Federal Data Strategy 2021 Action Plan - Action 3. Having this knowledge will help provide an agency-wide lens when incorporating budget considerations into your data and analytics strategy.

4.4 **Connect your business problems to the key agency questions** that data can help answer to prioritize transformational opportunities.

4.5 **Conduct an inventory of your data tools and analytics platforms** to see how well they are integrated into your agency's business processes.

4.6 **Understand the value of predictive analytics** to create a future-focused organization.

4.7 **Develop a strategy framework** that moves the agency to a "**future**-state" focus and positions you as a strategic change agent.

4.8 **Create a working group with stakeholders** across various agency offices to assist with any strategic planning activities.

4.9 **Identify the strategic goals, sub-goals, and key objectives** for your data and analytics strategy.

4.10 **Link data specific resource allocations to the key business problems and objectives** that are core to your data and analytics strategy.

4.11 Create vision statements on ways to transform data stewardship, analytics, data technology/tools, data literacy, and data governance.

4.12 Develop a roadmap outlining a three-to-five-year strategic plan to address key objectives and strategic goals outlined in the action plan.

4.13 Analyze any existing and planned data investments to see if they are directly addressing your key business problems, compatible with your agency's mission, and aligned with your target data architecture. Consult your agency's CPIC or budget processes for further guidance on this step.

4.14 Review any set strategic goals and key objectives to ensure they have clear timelines and metrics.

4.15 Create an action plan that outlines key objectives and strategic goals with assignments to key stakeholders (e.g., data stewards.).

4.16 Identify and prioritize the projects within your agency that can accelerate progress while building critical capabilities.

4.17 When interacting with key stakeholders to **advocate for any data and analytics investments,** emphasize the importance of these investments as integral to both the agency's IT strategy and data and analytics strategy.

4.18 Audit the action plan on a yearly basis to ensure it is aligned with changing priorities and new iterations of the Federal Data Strategy.

4.19 Measure the progress of your data and analytics strategy including your strategy framework, action plan, and critical projects.

4.20 Continuously communicate the value and measured progress of your data and analytics strategy's action plan and critical projects to external and internal stakeholders.

4.21 Consider using open and interoperable tools as a sustainable and more cost-effective resource to address your mission needs.

4.22 Prioritize centralized data analytics, Machine Learning (ML), and Artificial Intelligence (AI) projects in your data and analytics strategy and investment plans.

4.1 Focus on use cases, pain points, and transformation/innovation opportunities when interviewing key stakeholders to assess your agency's current data landscape. This assessment will present where the existing data sources and silos are and opportunities for data to accelerate change and improve existing KPIs.

KEY ACTIVITIES

- **Identify the pain points from key stakeholders** and where they see near term opportunities to transform the organization.

- **Develop a data and analytics strategy** which considers perspectives from across the organization with the goal of influencing the overall business strategy.

4.2 Identify any shared goals, consistent themes, and parallel findings from the stakeholder interviews.

KEY ACTIVITIES

- **Discover points of intersection** between stakeholder groups to connect priorities for future collaboration opportunities.

- **Create a data and analytics strategy** needs to be enterprise focused and not centered on any single agency office or entity.

- **Address the overlapping priorities of agency staff** across the organization and creating solutions that emphasize data sharing and shared services.

4.3 **Understand your agency's budget process** including the IT investment management processes to ensure that appropriate resources are planned for in future budgets as required under the Federal Data Strategy 2021 Action Plan - Action 3. Having this knowledge will help provide an agency-wide lens when incorporating budget considerations into your data and analytics strategy.

KEY ACTIVITIES

- **Gain an understanding of the IT investment management processes** (e.g., Capital Planning and Investment Control or CPIC) to help guide future decision making and get integrated into the federal budget process.

- **Ensure your budgeting and resource allocation is aligned** with the CIO Office and established federal-wide policies and practices in the future.

4.4 **Connect your business problems to the key agency questions** that data can help answer to prioritize transformational opportunities.

KEY ACTIVITIES

- **Conduct a deep dive** into your core business problems to figure out its origins to better identify solutions that the data and analytics strategy can address.

- **Create a data and analytics strategy** that clearly outlines and demonstrates your understanding of the core business problems within your organization. Only then can you specifically link these core business problems and their root causes to innovative solutions that answer your key agency questions.

4.5 **Conduct an inventory of your data tools and analytics platforms** to see how well they are integrated into your agency's business processes.

KEY ACTIVITIES

- **Connect your existing data investments to your business processes** helps you identify if these investments are still needed and are providing value to your organization.

- Catalog all your existing tools and platforms to create an inventory that documents all your existing investments in one place.

4.6 **Understand the value of predictive analytics** to create a future-focused organization.

KEY ACTIVITIES

- **Identify opportunities to gain a quick win** through predictive analytics tools and platforms.

- **Incorporate predictive analytics and its ability to identify future trends** to get your organization ahead. Predictive analytics tools and platforms can cut costs, rapidly identify solutions to future problems, and create a culture of preventing problems, not just reacting to them within your organization.

- **Investigate the power of predictive analytics tools to transform** your organization to demonstrate your vision.

4.7 **Develop a strategy framework** that moves the agency to a "**future**-state" focus and positions you as a strategic change agent.

KEY ACTIVITIES

- **Link your business problems and agency mission** to transformative solutions that are driven by greater data utilization, established data practices, and defined data management standards.

- **Establish a framework** that considers the agency's size, data priorities, and data architecture.

- **Use this framework to highlight your plans** to progress the data culture away from the current state and influence the enterprise-wide business strategy.

4.8 **Create a working group with stakeholders** across various agency offices to assist with any strategic planning activities.

KEY ACTIVITIES

- **Create working relationships** between key agency employees for information sharing and strategy building purposes.
- **Build a holistic enterprise data and analytics strategy** that brings these groups together to connect priorities across agency offices.

AGENCY EXAMPLE

- The CDO of the Department of Labor organized a weekly sub-group with the Chief Evaluation Officer, Chief Performance Officer, and the Chief Statistical Officer to strategize on how to prioritize data projects across agency offices and departments.

4.9 Identify the strategic goals, sub-goals, and key objectives for your data and analytics strategy.

KEY ACTIVITIES

- **Define the key markers for success** within your data and analytics strategy and document them in a clear and concise format.
- **Identify goals, sub-goals, and key objectives** that clearly illustrate your plans to leverage data as a strategic asset while also centering your agency's mission and data customer's priorities.

4.10 Link data specific resource allocations to the key business problems and objectives that are core to your data and analytics strategy.

KEY ACTIVITIES

- **Connect and explain** how any new data specific technologies, programs, etc. will address your agency's key challenges.
- **Understand the problems** your agency is facing and your core mission objectives before you submit plans to invest in data specific resources.
- **Include resource allocations and investment plans** that provides a solution to a business problem and further your agency's set strategic goals.

AGENCY EXAMPLE

- The USDA CDO identified a key business problem; employees had become accustomed to slow processes due to limited or no data access. Understanding this reality allowed them to dig deeper into the root of the problem through stakeholder interviews and design sprints where they identified the data that existed and the data that was needed to improve efficiency. This ultimately led to the creation of new infrastructure, the USDA's Enterprise Data Analytics Platform and Toolset (EDAPT).

4.11 Create vision statements on ways to transform data stewardship, analytics, data technology/tools, data literacy, and data governance.

KEY ACTIVITIES

- **Align the messaging in your data and analytics strategy** to the future state, moving beyond the current data environment and prioritizing the projects and activities that will transform your agency.
- **Track and account for existing data-specific budget allocations** and resources when advocating for transformation activities. Also, anticipate impacts to other strategies at the agency level including the agency strategic plan, the IT strategy, etc.

4.12 Develop a roadmap outlining a three-to-five-year strategic plan to address key objectives and strategic goals outlined in the action plan.

KEY ACTIVITIES

- **Use the strategic roadmap to demonstrate** your ability to set goals that are attainable and map out longer timelines for projects that are five to ten years into the future.
- **Provide an actionable timeline** that features each marker (e.g., goals, sub-goals, objectives, pilot projects) within your data and analytics strategy.

- **Prioritize goals and projects to tackle first,** such as the high impact projects with shorter timelines that can demonstrate value early and help you gain influence.

4.13 Analyze any existing and planned data investments to see if they are directly addressing your key business problems, compatible with your agency's mission, and aligned with your target data architecture. Consult your agency's CPIC or budget processes for further guidance on this step.

KEY ACTIVITIES

- **Create alignment** between your mission needs and your existing data resources.
- **Identify any inefficiencies** that exist within your organization to help you consider different resource options or suggest replacing certain budget requests that are not connecting directly to your core business problems.

4.14 Review any set strategic goals and key objectives to ensure they have clear timelines and metrics.

KEY ACTIVITIES

- **Set clear timelines** and metrics to track progress and account for any roadblocks to your data and analytics strategy that may emerge.
- **Provide an opportunity to revise your strategy** periodically based on goals or objectives that are not consistently achieving the required standards linked to mission KPIs.

4.15 Create an action plan that outlines key objectives and strategic goals with assignments to key stakeholders (e.g., data stewards.).

KEY ACTIVITIES

- **Ensure accountability** for each set objective and goal and a key point person who can manage its progress.

- **Develop measurable objectives and strategic goals** that are managed by individuals across your organization sets your data and analytics strategy's action plan up for success. For example, data stewards can oversee a specific portion of the strategy that best aligns to their strengths and job duties.
- **Work with data stewards** to define future success factors for their assignments as the action plan progresses.

4.16 Identify and prioritize the projects within your agency that can accelerate progress while building critical capabilities.

KEY ACTIVITY

- **Prioritize projects which demonstrate near term value** to gain trust from your key stakeholders and buy-in for future projects with longer implementation timelines and more challenging projects.
- **Include pilot projects** that can demonstrate the value data can bring to programs and build a business case for future investments that support the enterprise.

AGENCY EXAMPLE

- The Food and Drug Administration (FDA) CDO in their Data Modernization Action Plan identified "driver projects" defined as initiatives with measurable value that allow multiple stakeholders to envision what is possible, allow technical and data experts to identify needed solutions, and develop foundational capabilities.

4.17 When interacting with key stakeholders to **advocate for any data and analytics investments,** emphasize the importance of these investments as integral to both the agency's IT strategy and data and analytics strategy.

KEY ACTIVITIES

- **Emphasize the CDO role as integral** across business units and interconnected with other priorities of the organization.

- **Ensure stakeholder groups understand the mission** enabling value of data investments as equally critical to IT investments. For example, work closely with the CIO and other key stakeholders to develop a case for change to advocate for a target data architecture plan.

4.18 Audit the action plan on a yearly basis to ensure it is aligned with changing priorities and new iterations of the Federal Data Strategy.

KEY ACTIVITIES

- **Ensure your data and analytics strategy connects** to the larger priorities of the federal government and CDO community.

- **Keep your agency's data and analytics strategy moving forward** by incorporating new visions and priorities, and emerging technologies that could be used to solve business problems as your organization progresses in data maturity.

4.19 Measure the progress of your data and analytics strategy including your strategy framework, action plan, and critical projects.

KEY ACTIVITIES

- **Keep your data and analytics strategy updated** and consistent with changing priorities, mission KPIs, and lessons learned.

- **Look for any set objectives that are not demonstrating success factors** to locate potential roadblocks and identify a different path.

4.20 Continuously communicate the value and measured progress of your data and analytics strategy's action plan and critical projects to external and internal stakeholders.

KEY ACTIVITIES

- **Gain influence and create awareness of your agency's success** by reiterating the success factors of your data and analytics strategy to key stakeholder groups.

- **Find opportunities to demonstrate the value of projects** and initiatives that have been implemented, and the need for future investments to further grow progress in those avenues.

- **Demonstrate your ability** to build and grow trust within your stakeholder relationships by demonstrating how your agency is advancing.

4.21 Consider using open and interoperable tools as a sustainable and more cost-effective resource to address your mission needs.

KEY ACTIVITIES

- **Provide a low or no-cost option** that fosters greater collaboration and integrated decision-making opportunities.

- **Maximize your data use,** as directed in the Evidence Act and ease barriers to access for internal users. Unlike software that require licenses, these types of tools provide no cost options to users.

AGENCY EXAMPLE

- The Department of Labor (DOL) CDO primarily uses open-source analytical tools as a sustainable and scalable solution for its organization. They engineer the freeware version of these tools to be compatible with their organization's needs allowing more customers to gain access without having to buy licenses.

4.22 Prioritize centralized data analytics, Machine Learning (ML), and Artificial Intelligence (AI) projects in your data and analytics strategy and investment plans.

KEY ACTIVITIES

When a need or problem is clearly defined, ML and AI has the potential to recommend and/or automate decisions and actions, increasing efficiency for agency offices.

- **Implement a methodical approach** to build ML and AI pipelines.

- **Develop ML and AI models** that provide both the functionality and the procedures for how these models make decisions.

- **Communicate through your strategy,** the tangible benefits of using ML and AI to support your agency's mission.

PLAY 4 LESSONS LEARNED

- **Understand the decision-making style** (e.g., relationship-based, memo, or directive driven) and motivating factors (e.g., OMB, Government Accountability Office (GAO), or industry research) of your agency and how that plays into strategy building.

- **Create a standard definition** for how your data and analytics strategy will return value to the agency so there is a common understanding on what value creation means.

- **Consider leveraging different types of team environments** (e.g., time bound working groups, project specific teams, enduring working groups) when bringing together stakeholders for strategy building.

- **Consider the commitment, focus, and priorities** of senior leadership when identifying projects that can provide you with quick wins and show near-term value.

- **Consider the scalability of specific resources, tools, and investments,** choose options that allow better accessibility and sharing between your data consumers.

PLAY 4 RESOURCES

- [Department of Veteran Affairs Data Strategy](#)
- [U.S. Food and Drug Administration Data Modernization Action Plan](#)
- [Department of Defense Data Strategy](#)
- [Department of Commerce Data Strategy](#)

Federal Policies and Guidelines

Below is a list of relevant federal laws and policies applicable to the CDO role.

Evidence Act
- Foundations for Evidence-Based Policymaking Act of 2018

OPEN Government Data Act
- Open, Public, Electronic, and Necessary Government Data Act

FDS
- Federal Data Strategy

DATA Act
- Digital Accountability and Transparency Act of 2014

GDA
- Geospatial Data Act of 2018

FFATA
- Federal Funding Accountability and Transparency Act of 2006

IQA or Data Quality Act (DQA)
- Information Quality Act of 2000

Privacy Act
- Privacy Act of 1974

PRA 1980
- Paperwork Reduction Act of 1980

PRA 1995
- Paperwork Reduction Act of 1995

FISMA 2014
- Federal Information Security Modernization Act of 2014

M-19-18
- Federal Data Strategy - A Framework for Consistency

M-19-23
- Phase 1 Implementation of the Foundations for Evidence-Based Policymaking
- Act of 2018: Learning Agendas, Personnel, and Planning Guidance

M-20-12
- Phase 4 Implementation of the Foundations for Evidence-Based Policymaking
- Act of 2018: Program Evaluation Standards and Practices

M-13-13
- Open Data Policy-Managing Information as an Asset

M-19-15
- Improving Implementation of the Information Quality Act

EO 13985
- Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government

PMA CAP Goal, Leveraging Data as a Strategic Asset
- President's Management Agenda, Cross-Agency Priority Goals Leveraging Data as a Strategic Asset

federal CDO council

If you have questions or would like more information about the case studies, contact **cdocstaff@gsa.gov**.

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