

IMPLEMENTING FEDERAL-WIDE HR DASHBOARDS

**CDO Council Special Projects
Final Recommendations
December 2021**

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FEDERAL-WIDE HR DASHBOARDING PILOT

EXECUTIVE SUMMARY

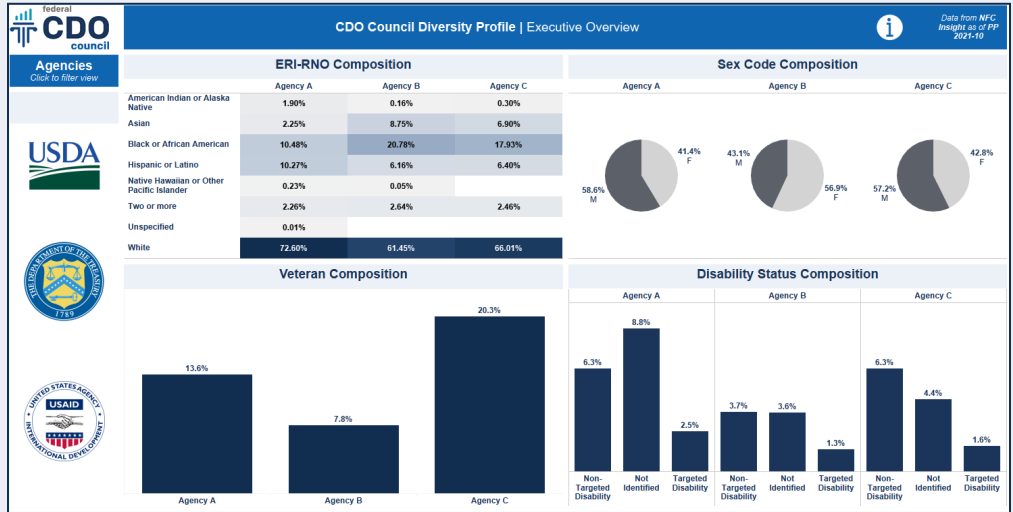
PURPOSE

With the goal of advancing data-driven decision making, innovation, and data practices across the Federal Government, the Chief Data Officers (CDO) Council partnered with the Department of the Treasury (USDT), the United States Agency for International Development (USAID), and the Department of Transportation (DOT) – collectively referred to as stakeholder agencies – to develop a Diversity Profile dashboard and demonstrate the value of shared HR decision support.

DASHBOARD PILOT

In support of the Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government and the Executive Order on Diversity, Equity, Inclusion, and Accessibility in the Federal Workforce, our team developed a Diversity Profile dashboard using USDT, USAID, and USDA personnel data from NFC INSIGHT.

DIVERSITY PROFILE



The Diversity Profile provides access to and compares key metrics on each organization’s diversity composition according to ethnicity and race, sex code, age, disability status, and veteran status.



HOW IS THIS DASHBOARD DIFFERENT FROM WHAT EXISTS TODAY?

This pilot demonstrated that data from different agencies could be brought into a single dashboard, examining data access and data mapping processes as they relate to a universal dashboard template. It illuminates relevant points of comparison for key HR metrics, facilitating conversation between agencies on best-practice HR strategies.

FINDINGS



HR PROVIDER DATA ACCESS CHALLENGES

The main challenge faced during this pilot was gaining access to data from multiple agencies. This cross-agency collaboration required HR providers to create and work through new processes.

GENERALIZABLE TOOLSETS PROVIDE VALUE

This pilot was successful in proving that agencies can benefit from efficiencies created as a result of standardized, best-in-class dashboards that can be shared and reused across the federal government. By leveraging the leading work of peers, agency development efforts can be streamlined, ultimately reducing duplicative development efforts, saving costs, and improving key HR processes and metrics government-wide.

USDA DIVERSITY PROFILE DEVELOPMENT
2 mos.

PILOT DIVERSITY PROFILE DEVELOPMENT
2 wks.

POTENTIAL TIME SAVINGS

Based on the hours our team spent developing the USDA and Pilot Diversity Profile dashboards, other agencies can expect similar time savings when leveraging a template like this.

FEDERAL-WIDE HR DASHBOARDING PILOT

EXECUTIVE SUMMARY

Informed by the pilot proof-of-concept, we recommend the following HR data visualization services to provide decision support tools and facilitate collaborative analytics across the federal government.

RECOMMENDED SERVICES

1 Standardized dashboard templates

Source best-in-class HR dashboard templates from agencies across the federal government to host and offer to all agencies. These templates would follow United States Office of Personnel Management (OPM) data standards and would be accessible to all agencies to tailor them to fit mission or business needs.

2 Dashboards with comparisons, data insights

Offer dashboards as a service, including access to production dashboards via authenticated login. Agencies could use the service's infrastructure rather than standing up their own to use the dashboards. Agencies could view their data in relation to a masked segment of agencies with similar size and mission to provide a benchmark. Data insights and HR strategy recommendations can help improve trends illuminated by the data visualizations.

3 Ad-hoc, custom analytics support

Offer a third service option in which analytics staff or contractors provide ad-hoc HR analytics support for agencies that may not have a robust data analytics program in place. The team could assist agencies that would like further tailoring of their dashboard templates but don't have their own internal team to support the customization effort.

The following entities can support the implementation of these three services:

IMPLEMENTATION RECOMMENDATIONS

GOVERNMENT LEAD	HR PROVIDERS	AGENCIES
<p><i>A government lead, such as OPM or the HR QSMO, should be identified to:</i></p> <ol style="list-style-type: none"> 1. Serve as an authoritative source for dashboard templates 2. Incorporate OPM data standards and support templates for various data visualization tools 3. Coordinate template sourcing and sharing for HR topics across the HCBRM 4. Establish agency comparison and analytics support services and technical infrastructure 5. Facilitate HR community roundtables on shared HR tools and best practices 	<p><i>HR Providers could:</i></p> <ol style="list-style-type: none"> 1. Enhance existing dashboard services to incorporate above recommended services 2. Help customers collaborate through standardized language on data elements, security protocols, and processes for cross-agency data sharing 3. Create secure APIs for customers to easily access their data 	<p><i>Agencies could:</i></p> <ol style="list-style-type: none"> 1. Participate in round-table conversations 2. Share agency HR strategies and dashboard templates 3. Assess or implement data analytics infrastructure, including selecting preferred data visualization tools or services 4. Integrate end-to-end HR data sources and create data dictionaries 5. Establish processes for HR and analytics staff collaboration and data cleaning

The graphic features a light blue background with a thick, dark blue diagonal line that curves from the top right towards the bottom left. A vertical dark blue line is positioned to the left of the text. The text 'PROJECT OVERVIEW' is written in a bold, dark blue, sans-serif font.

PROJECT OVERVIEW

INTRODUCTION

THE PILOT

With the goal of advancing data-driven decision making, innovation, and data practices across the Federal Government, the Chief Data Officers (CDO) Council partnered with the Department of the Treasury (USDT), the United States Agency for International Development (USAID), and the Department of Transportation (DOT) – collectively referred to as stakeholder agencies – to develop a Diversity Profile dashboard and demonstrate the value of shared HR decision support.

THE PROOF-OF-CONCEPT DASHBOARD

We developed a Diversity Profile dashboard displaying data from the USDT, USAID, and USDA. This effort supports the Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government and the Executive Order on Diversity, Equity, Inclusion, and Accessibility in the Federal Workforce. It also demonstrated that tools like these offer significant value by creating efficiencies through novel insights and visualizations; reducing duplicative development efforts across government; and ultimately realizing cost savings for agencies and the broader USG.

THE REPORT

This report explores key takeaways from our pilot and recommendations for government-wide implementation of a similar solution, as well as the benefits and challenges of this solution, alternatives, and future considerations.

PROJECT OVERVIEW

PROJECT BACKGROUND

SCENARIO

Government agencies are increasingly relying on data to drive effective decision making. As a result, agencies have prioritized data collection and analysis to ensure the data that they use is timely, reliable, and actionable. Several agencies have made great strides in creating integrated approaches to data analytics and decision support development, infrastructure, and tools.

PAIN POINT

However, agencies are still frequently developing these solutions in parallel – duplicating efforts and solving the same problems that other agencies have solved. Furthermore, standing up these decision support tools can be costly and time-consuming, and crises and priorities such as COVID-19 workforce safety and equity have demonstrated the urgent need to ensure leadership across the government has access to critical, trusted information to make decisions on urgent and evolving situations with the best available data.

Identifying answers to questions regarding workforce safety in a crisis underlines the importance of being able to quickly deploy and access decision support.

OPPORTUNITY

The CDO Council (CDOC) recognized an opportunity to analyze how sharing decision support tools across agencies could offer significant value. Developing a proof-of-concept dashboard would demonstrate how multiple agencies could visualize their HR data in a standardized dashboard and inform best practices for advancing federal data analytics.

As a result, **USDA proposed a proof-of-concept pilot project to the CDO Council.** Supported by CXO funding, the CDO Council worked with stakeholder agencies across the government to develop a proof-of-concept HR dashboard – a Diversity Profile aligned with the Executive Order on [Advancing Racial Equity and Support for Underserved Communities Through the Federal Government](#), signed prior to the pilot, and the Executive Order on [Diversity, Equity, Inclusion, and Accessibility in the Federal Workforce](#), signed just before this report's publication.

The proof of concept would demonstrate how agencies, government-wide, can benefit from efficiencies in generalizable, best-in-class dashboards that can be shared and reused across the federal government to help individual agencies respond more quickly and effectively to emergent issues and ever-changing current events.

PROJECT OVERVIEW

CURRENT LANDSCAPE STAKEHOLDER AGENCY DATA VISUALIZATION EFFORTS



Department of Transportation

The Department of Transportation (DOT) uses both Tableau and Power BI to visualize their departmental data and has recently undertaken efforts to develop diversity dashboards in line with the Administration's Executive Order on Advancing Racial Equity. Many of the enhancements in the appendix are a direct result of both DOT and USDA sharing development progress and best practices.



U.S. Department of the Treasury (USDT)

The Department of Treasury has developed dashboards across its mission agencies in a partnership between its CHCO and CIO offices, displaying information in functional areas across the department. In looking at the human capital function, it has taken early steps in visualizing its time-to-hire, workforce numbers, displaying facilities geographically to support COVID decisions, and more.



U.S. Agency for International Development (USAID)

USAID is working to visualize data in Tableau, including developing HR dashboards on topics such as diversity. USAID faces unique challenges due to disparate domestic and international personnel systems. They have developed scripts to automate some HR reporting, and they are exploring additional data integration and visualization maturity.



U.S. Department of Agriculture (USDA)

USDA has built over 200 Tableau dashboards across its 29 agencies, which analyze and visualize everything from agency-level hiring metrics to COVID-19 risks across field offices. EDAPT, USDA's data management platform, supports these dashboards across nearly every Mission Area and administrative function – including HR, IT, Finance, Procurement, Property & Fleet, Operations, and Homeland Security. Functional areas like human resources have especially benefitted from these dashboards, where decision support has been provided to human capital officers and leaders with consistent reporting on workforce composition, attrition, demographics, time-to-hire, key vacancies, and more.

These are the stakeholder agencies we worked with...

We know that many other agencies have performed similar development work that could be centralized and shared.

PROJECT OVERVIEW

PROJECT APPROACH

USDA and the CDOC recognized that many departments face similar challenges:

How do we visualize data across several agencies, functional areas, and data sources?

How do we ingest, integrate, store, and manage all of this information?

Upon visualizing it, how do we use this information most effectively? How do we act on it? How do we use it to drive or support decisions?

To answer these questions, departments and agencies are developing similar data visualizations in siloes across government. The USDA analytics efforts resulted in Tableau dashboard templates that have potential for government-wide sharing, and the team realized that there is much to gain by leveraging each other's data visualization experience and sharing decision support government-wide.

The team narrowed in on HR as the functional area that would provide the most immediate value to agencies. We then hosted human-centered design thinking sessions to understand the human capital data needs of our stakeholder agencies and prioritize a dashboard to develop in our four-month pilot. Based on a ranking exercise and an interest to further the Executive Order, our stakeholders aligned on developing a Diversity Profile dashboard, similar to one developed at USDA, that included USDT and USAID data from NFC INSIGHT.

We worked with USDT and USAID to develop and enhance a Diversity Profile dashboard for their organizations based on existing dashboards and stakeholder input. We did not develop a DOT Diversity Profile dashboard, however, we collaborated together to improve their Diversity Profile dashboard in Power BI, while simultaneously improving our Diversity Profile dashboard in Tableau. This pilot provided an opportunity to improve upon the USDA dashboards and share best practices based on the development work of other agencies – creating a tool that could benefit most agencies across the federal government.

Another direct application for selecting the Diversity Profile dashboard

Management Directive 715 (MD-715) requires agencies to submit workforce data annually to the Equal Employment Opportunity Commission (EEOC). The Diversity Profile dashboard assists agencies in responding to the MD-715, as well as informs strategic planning and recruitment efforts.

PROJECT OVERVIEW

1 Discovery

- Desk research on HR providers and customers; agency data sources and systems
- Dashboard demo sessions
- OPM data standards and HR frameworks
- Understanding of data access requirements

2 Design

- Human-centered design thinking session to understand current data visualization maturity and prioritize dashboard interest and needs
- Requirements gathering and refinement sessions

3 Development

- Implementation of Memorandums of Understanding (MOUs) for data access
- Iterative development of dashboard and recommendations report, incorporating feedback from twice-weekly check-ins with CDO Council representatives and bi-weekly and ad-hoc sessions with stakeholder agencies

4 Delivery

- Demo of proof-of-concept dashboard
- Share pilot dashboard templates with participating agencies and CDO Council
- Delivery of final report, including recommendations for further development of the proof-of-concept tools and government-wide implementation

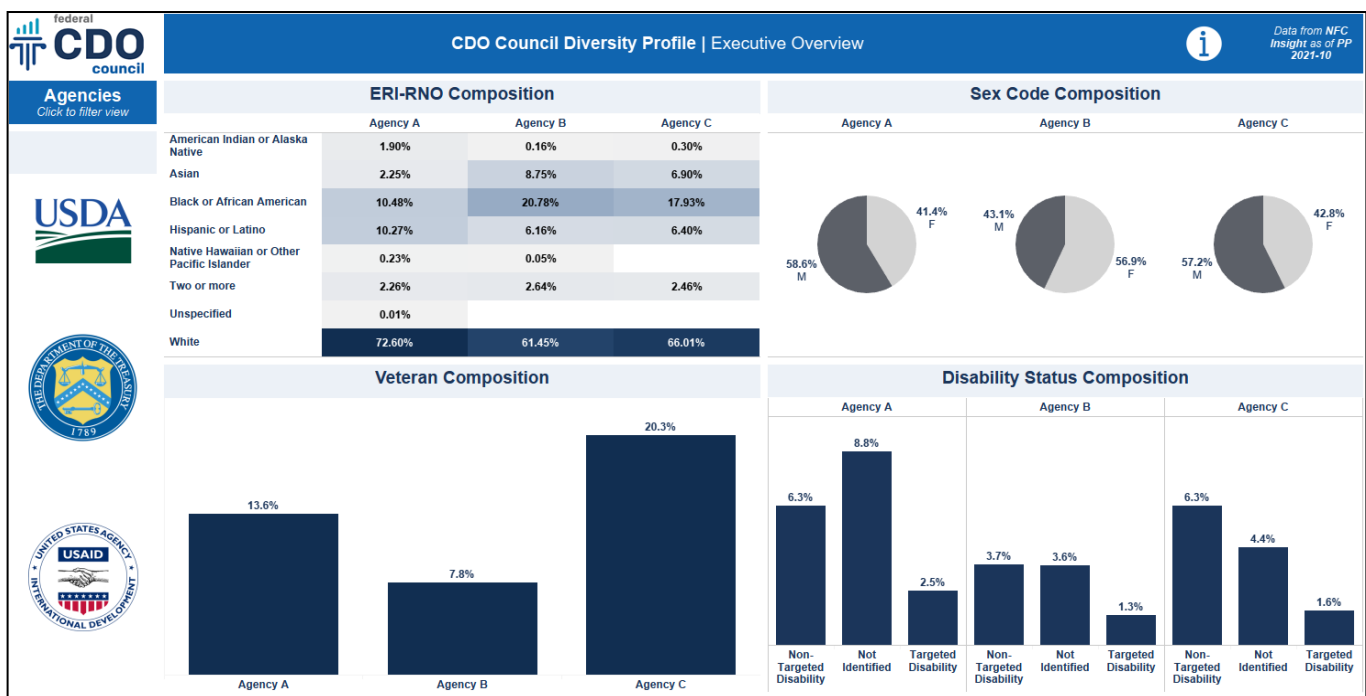
The purpose of the pilot was to demonstrate that data from different agencies could be combined into a single dashboard, while also examining data access and data mapping processes as they relate to a universal dashboard template or cross-agency data analytics service.

PROJECT OVERVIEW

DIVERSITY PROFILE DASHBOARD

The Diversity Profile dashboard selected for the pilot provides access to information on each organization's diversity composition according to ethnicity and race, sex code, disability status, and veteran status.

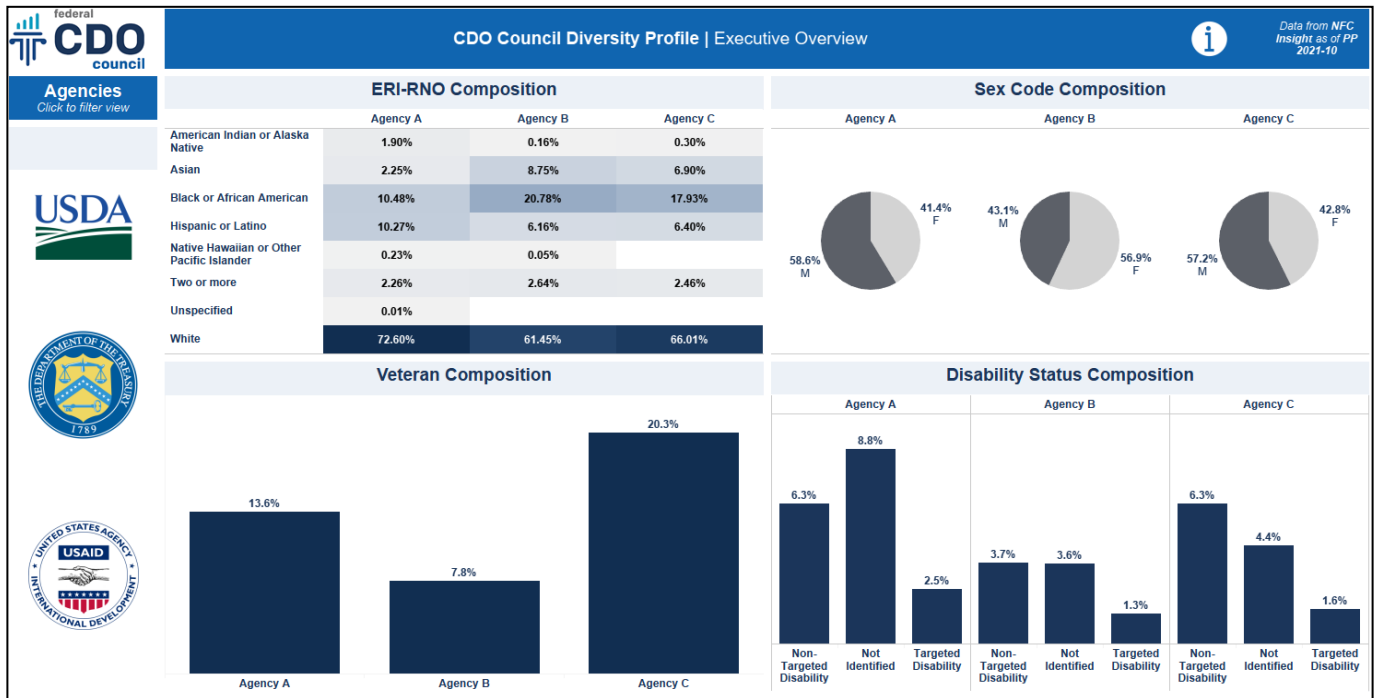
Note: All figures in the following screenshots should be considered notional and unrelated to any of the pilot agencies.



The data for this dashboard comes from the Workforce Profile subject area of NFC INSIGHT. However, similar data could be pulled from other payroll systems or shared service providers, such as the Interior Business Center. Due to the short project timeline and delays in data access, this dashboard was built using one pay period of personnel data from USDT and USAID. Future enhancements could include pulling historical personnel data to show trends over time, as well as data from the Personnel History subject area of NFC INSIGHT to show hiring and attrition information for each organization. More details on recommended enhancements to this proof-of-concept dashboard can be found in the [appendix](#).

PROJECT OVERVIEW

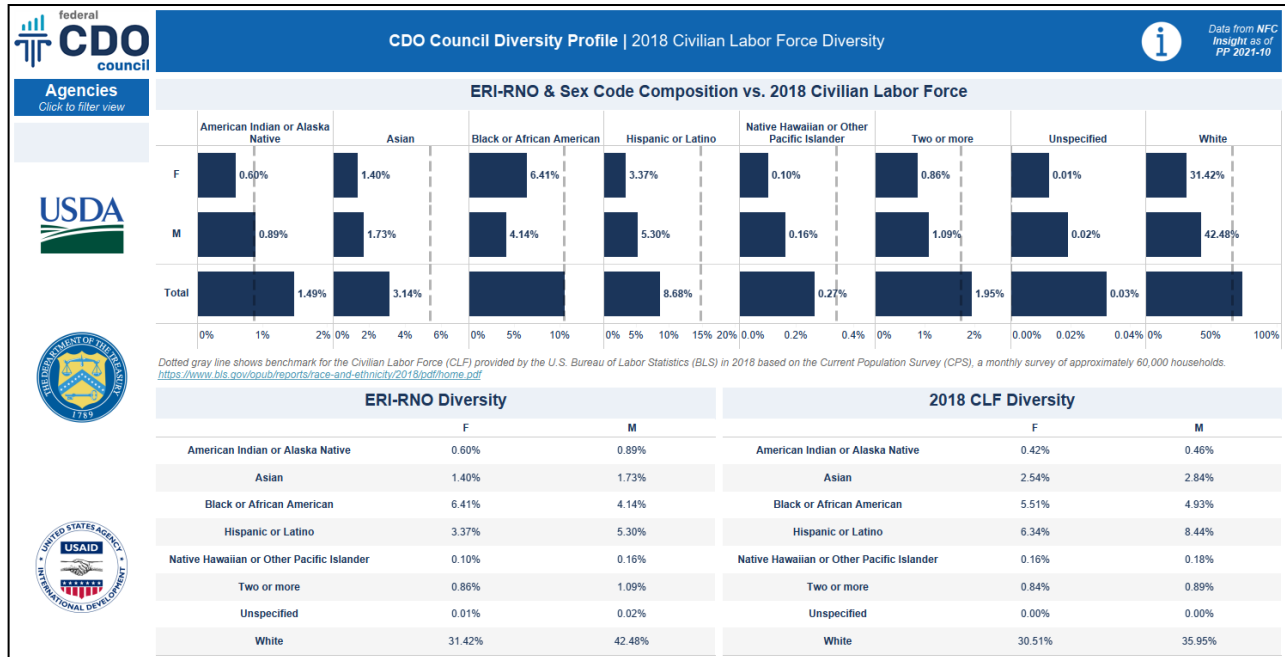
The **Executive Overview** uses personnel data from USDA, USDT, and USAID to compare key diversity metrics. It is important to note that while the full USDA workforce is represented in the pilot dashboard, only a portion of the USAID and USDT workforces are represented due to agency personnel privacy and the short pilot timeframe of this proof-of-concept.



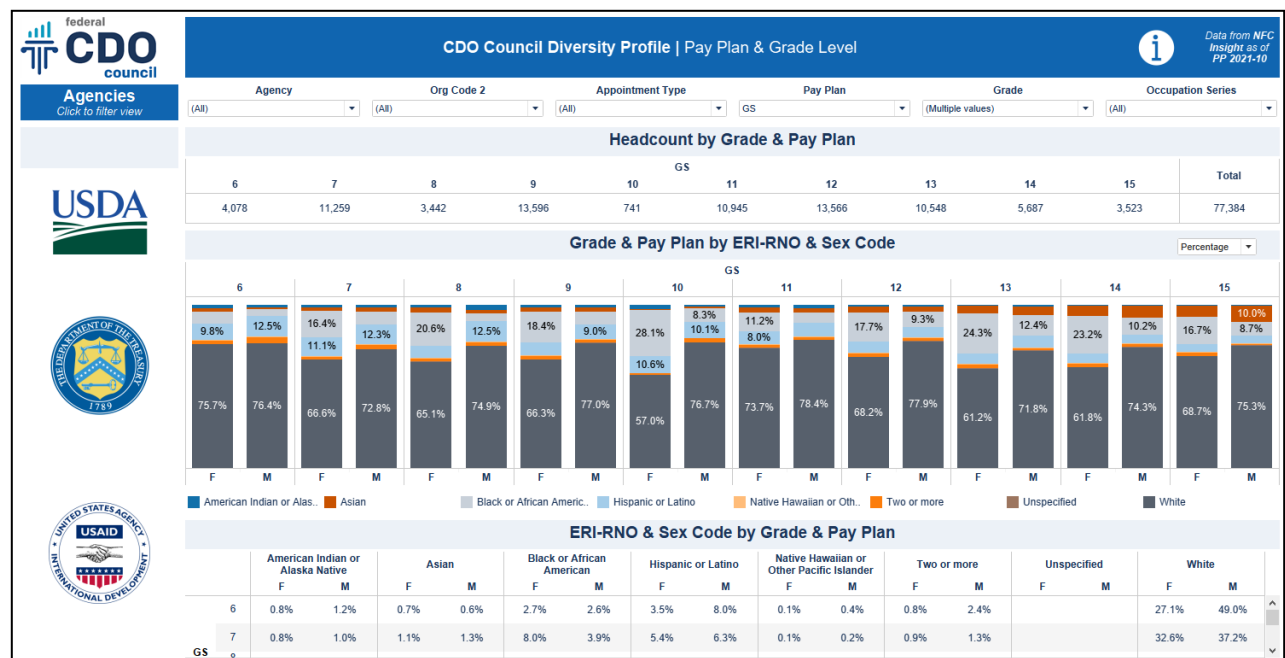
Agencies will be able to click on any of the logos on the left-hand side of the dashboard to filter the view to their specific agency's data.

PROJECT OVERVIEW

The **Civilian Labor Force view** provides insight into an agency's workforce diversity profile compared to the 2018 Bureau of Labor Statistics Civilian Labor Force (CLF). This data was based on the Current Population Survey, a monthly survey of approximately 60,000 households.



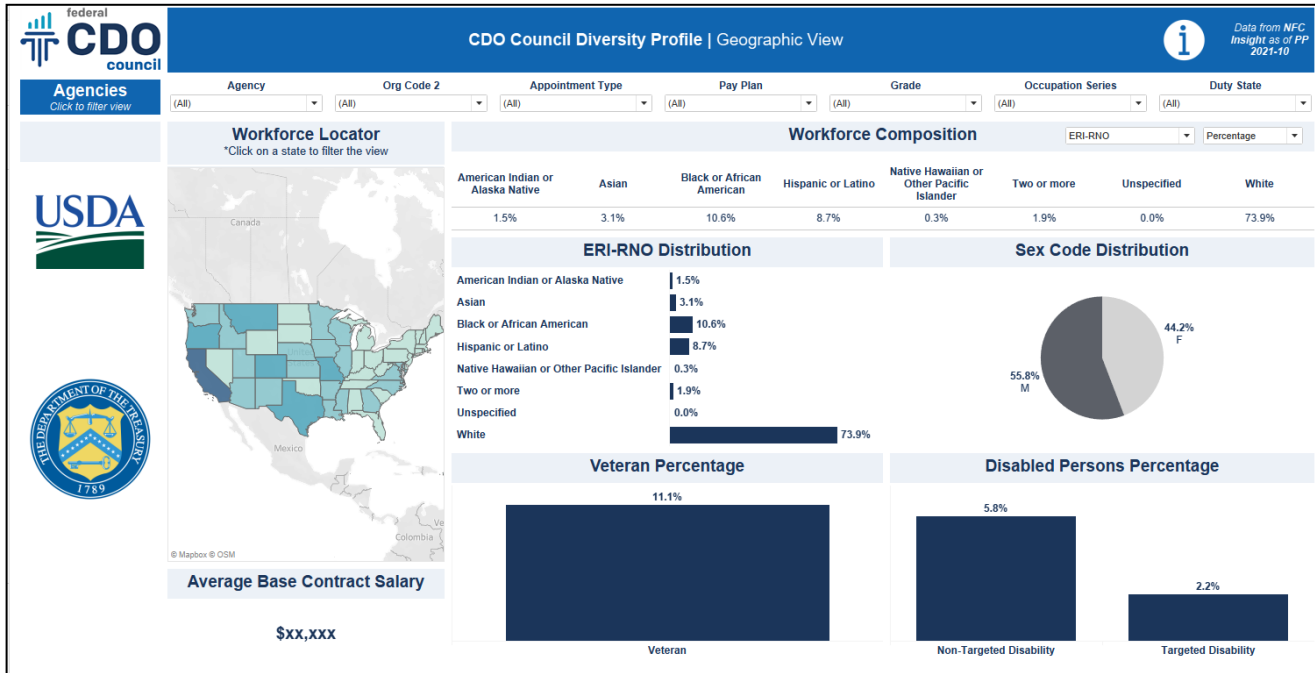
The **Pay Plan & Grade Level view** provides a detailed deep-dive of Ethnicity Race Indicator and Race and National Origin (ERI-RNO) and sex code by selected pay plans and grades.



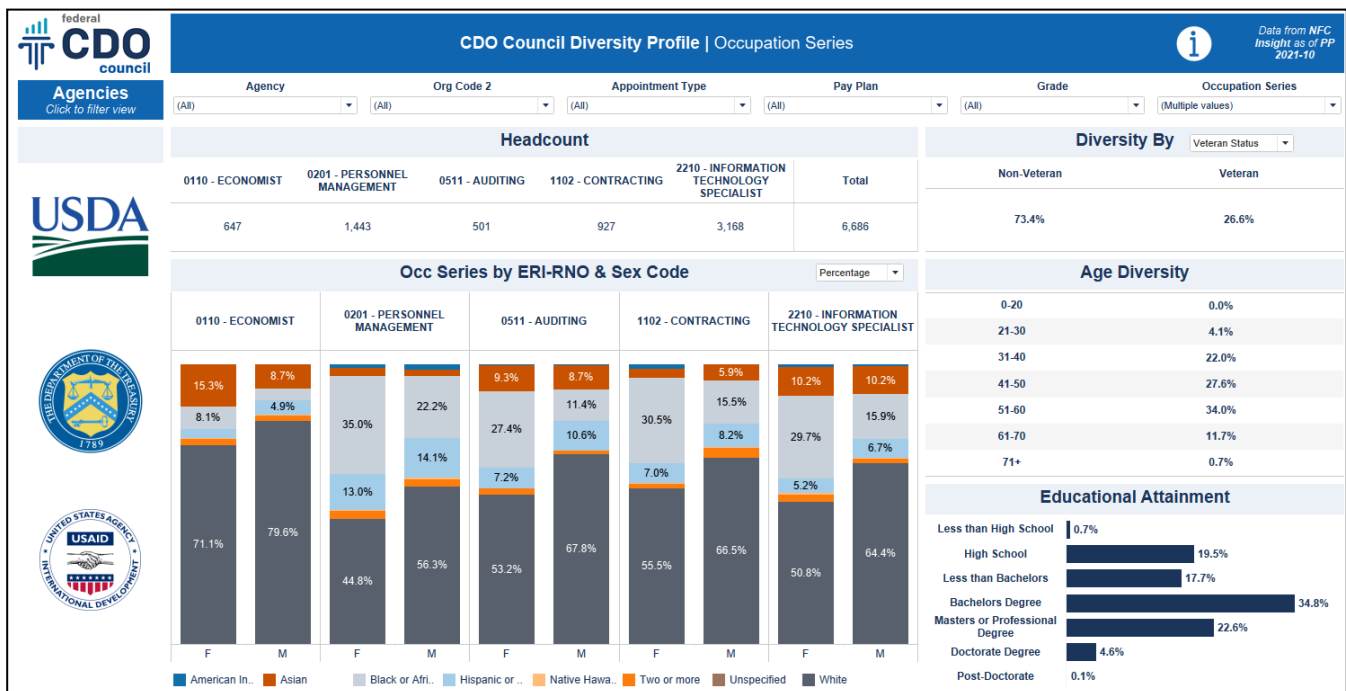
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PROJECT OVERVIEW

The **Geographic view** allows users to gain insight into diversity composition by specific location. Users can click into a state on the map to filter the dashboard view.



The **Occupation Series view** provides information on ERI-RNO & sex code, disability status, veteran status, age, and educational attainment for the selected occupation series. The view is defaulted to display information for the government-wide mission critical occupations (MCOs).





**GOVERNMENT-WIDE
IMPLEMENTATION
RECOMMENDATIONS**

RECOMMENDATIONS OVERVIEW

RECOMMENDATIONS OVERVIEW

The results of this pilot and the proof-of-concept Diversity Profile dashboard reveal significant value in developing a standardized suite of HR dashboards and services to provide decision support tools to agencies across the federal government. There is also demonstrated value in collaborative analytics between agencies, with tools that span HR topics, such as employee workforce, demographic representation, time-to-hire, employee timekeeping, and workforce trends over time.

We recommend establishing the following data visualization services to benefit agencies across the federal government:

- 1 Standardized dashboard templates** – free of charge
- 2 Authenticated access to dashboards with agency comparisons and data insights** – paid service
- 3 Ad-hoc, customized analytics support** – paid service

The following sections outline these three services, and how government leads (e.g., OPM or the HR QSMO), HR providers, and agencies can support their implementation.

GOVERNMENT LEAD

A government lead should be identified to:

1. Serve as an authoritative source for dashboard templates
2. Coordinate template sourcing and sharing
3. Facilitate roundtables
4. Establish agency comparison and analytics support services

HR PROVIDERS

HR Providers could:

1. Enhance existing dashboard services to incorporate above services
2. Help customers collaborate through standardized language on data elements, security protocol, and processes for cross-agency data sharing
3. Create secure APIs for customers to easily access their data

AGENCIES

Agencies could:

1. Participate in roundtable conversations
2. Share agency HR strategies and dashboard templates
3. Assess or implement data analytics infrastructure, create data dictionaries, and establish processes for data cleaning

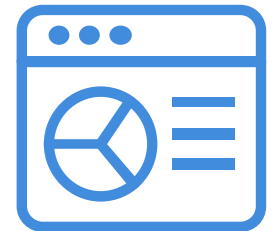
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RECOMMENDATIONS OVERVIEW

By first developing the dashboard templates (service #1) and then building the authenticated access (service #2) and analytics support services (service #3), a government lead can provide immediate value to agencies across the government through standardized, reusable decision support tools. The government lead could then continue to expand upon these services to provide additional value to agencies. The following sections detail these recommended dashboard solutions.

① **DASHBOARD SERVICE #1: STANDARDIZED DASHBOARD TEMPLATES**

We recommend that a government lead source best-in-class HR dashboard templates from agencies across the federal government to host and offer to all agencies. These templates would follow OPM data standards and would be accessible to agencies to tailor and fit their mission or business needs. As a result, agencies could reduce duplicative dashboard development efforts and more closely adhere to OPM data standards for more streamlined use of HR data and decision-making.



Federal HR employees across government would have access to download these templates from Max.gov, or a private GitHub managed by government leads. The templates would be available in popular data visualization tool formats – such as Tableau and Power BI – and will include core data elements, such as occupation series, pay plan and grade, that are broadly applicable across agencies. Aspects of the dashboards could be tailored by agencies based on their preference or business need; for example, updating the mission critical occupation categories that display or editing dashboard formatting to best suit their data needs.

Standardized and customizable dashboard templates will allow agencies with varying stages of data analytics maturity to quickly access the tools necessary to support their current and evolving business needs. Although agencies would still need to align data with templates and customize them, as desired, a suite of standardized dashboards would supply agencies with a nearly final product that they could quickly leverage.

RECOMMENDATIONS OVERVIEW

For example, while a prototype may be available within a matter of days or weeks, a more comprehensive dashboard that includes all the details and helpful features that end users require and desire could take far longer.

The USDA Diversity Profile dashboard – which served as the base template for this CDO Council pilot effort – required over two months of resource hours to develop and refine.

over
2 months
of development hours

Other agencies have made similar time investments to develop their own Diversity Profile dashboards. By offering a suite of predeveloped and standardized dashboard templates, a government lead could help reduce duplicative, time-intensive development efforts – resulting in time and cost savings government-wide.

The dashboard templates would incorporate government-wide best practices, OPM data standards, and best-in-class data visualizations. These kinds of readily accessible tools allow government agencies to leverage the leading work of their peers to understand and quickly respond to both their routine reporting and their most pressing challenges.

② **DASHBOARD SERVICE #2: AUTHENTICATED ACCESS TO DASHBOARDS WITH COMPARISONS & DATA INSIGHTS**



We also recommend offering dashboards as a service, by providing access to production dashboards via authenticated login for agencies to access data visualizations, populated with their data, using the service's infrastructure rather than standing up their own Tableau or Power BI server and cloud platform to use the shared dashboard templates. In this paid service, a government lead could offer dashboard development and publishing, server

maintenance and support, engineering infrastructure, and a data lake. These dashboards could also include comparisons of similar, masked agency data and data insights. Agencies would be able to view their data in relation to a masked segment of agencies with similar size and mission, to provide the agency with a benchmark.

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RECOMMENDATIONS OVERVIEW

Service #2 could be accessible to agencies that provide data to OPM, GSA, OMB, or other oversight groups. If one of these groups becomes the government lead, they can provide or share agency data in a standardized dashboard toolset. For example, agencies that use OPM's current services (e.g., USA Staffing or USAJobs) could visualize hiring data in these tools. Agencies that submit data to OPM (such as through the Enterprise Human Resources Integration (EHRI) office) could access new tools around EHRI workforce and diversity, equity, and inclusion (DEI) data. Agencies that use Monster.com as their talent acquisition system could see assessment and selection data that is submitted by Monster to GSA for OMB.

Another example of OPM data that could be used in a dashboard comparison view is Federal Employee Viewpoint Survey (FEVS). Although OPM creates valuable government-wide reports comparing FEVS data, there is additional value in visualizing FEVS data in dashboard views –comparing employee engagement across federal agencies so HR professionals know at-a-glance where their agency stands compared to their peers. While the FedScope transactional data from EHRI is easier to obtain, sexual orientation and gender identity data would need to be accessed through FEVS in order to represent more key aspects of diversity in the dashboards. Another area that OPM currently has data on is the standalone federal employment reports, such as the Hispanic Employment Statistical Reports; a government lead could transfer these reports into a user-friendly dashboard view for easier reporting to Congress and other stakeholders.

The federal government and agencies will find immediate value in analyzing and developing dashboards using the existing data that OPM currently hosts. However, the government lead could instead – or in addition – enter into agreements with HR providers in order to connect the visualizations with personnel data that is updated biweekly. More details can be found on Page 24 of this report, in the Government Lead section under [Consider several data sources](#).

A government led hosting dashboard will not only add value from leveraging data, but agencies can save significantly on the cost and time required to stand up the technical infrastructure to support their own visualizations.

The relevant points of comparison are what differentiates these dashboards from existing services. For example, an agency or bureau, such as the FBI, could see how their diversity numbers compare not only to a Civilian or Federal Labor Force, but also how they compare to a masked, aggregated group of law enforcement agencies

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RECOMMENDATIONS OVERVIEW

of similar size. Because OPM catalogues the organizational structure of each agency for both the Plum Book and FEVS, a government lead could leverage this categorization to identify sub-agency components with similar missions or workforces. Identifying comparable sub-agency HR components using FEVS and Plum Book data would require iterative and regular updates. While not a “quick win,” identifying analogous benchmarks of relative performance would help agencies understand how their HR processes and metrics compare to other agencies.

Additionally, users could customize the dashboards and save personal views to fit agency-specific needs. For example, instead of a user having to manually select the same five occupational series from a dropdown each time they view a static dashboard, they could save this view to return to time and time again. Furthermore, when HR executives are faced with emergent issues, they not only need data to inform their decisions, but they need to understand, at a glance, the actions they should take as result.

This tool could provide data insights and recommendations for improving agency data trends illuminated by the data visualizations. The government lead could identify relevant performance indicators for dashboards. When presented with significantly negative trends, dynamic callouts and recommended actions could be provided by the lead to help agencies assess areas of their business that could improve the trends they are seeing within their agency.

Evaluate applicant retention to understand where your agency's candidates are leaving the process.

Evaluate employer branding and marketing for job openings. Are you reaching the right candidates?

The comparison tool could also be used to facilitate discussions between agencies on best-practice HR strategies. In analyzing performance indicators and trends illuminated by the data visualizations, agencies can attend roundtable conversations to 1) share HR strategies used in their agencies that correlate with positive trends in their data, and 2) take away best practices to mitigate negative indicators. For example, a cohort of similar agencies could quickly come together and use the dashboard comparison view as a tool to discuss recruitment strategies that agencies with strong recruitment numbers may implement, such as open continuous recruitments and additional selections.

RECOMMENDATIONS OVERVIEW

Drawing on prior experience partnering with agencies to improve their HR processes, the government lead could bring recommended HR strategies to roundtable conversations and capture additional strategies that arise in conversation. These strategies could inform the recommended action items in the comparison views.

While this would provide agencies with a very valuable service, it would require working through many complexities. Aligning on which agencies are considered similar in size and mission, developing the rules to compare these agencies, and ensuring the anonymization and security of agency data are all important and challenging aspects of this solution. However, by creating an analytics infrastructure to compare similar agencies, the government lead would create transparency on federal HR trends and aid agencies in improving key HR processes and metrics. This effort also aligns with current leadership goals to support agencies in developing the diversity of their workforce.

③ DASHBOARD SERVICE #3: AD-HOC, CUSTOMIZED REPORTING AND HR ANALYTICS SUPPORT

For agencies that may not have a robust data analytics program in place, we recommend the government lead offer a third service option in which analytics staff or contractors can provide ad-hoc HR analytics support. The team could assist agencies that would like further tailoring of their dashboard templates but don't have their own internal team to support the customization effort. For example, an agency may require a specific view based on their business needs, such as showing age groups on a view where it does not currently display. While agencies could submit feedback to enhance dashboard templates (service #1) or the authenticated dashboards (service #2), these are subject to review and consideration against the common needs of agencies government-wide. In cases where a government-wide change is not appropriate, some agencies may need to incorporate a specific data element or formatting into their own dashboards.

As part of this service, the government lead could also provide guidance on establishing an in-house technology infrastructure to support the dashboards on an agency's own Tableau or Power BI server. Additionally, the government lead could provide personalized, detailed data insights, HR strategy, or process reengineering recommendations based on agency trends. This service acts as a catch-all for any analytics support agencies may need in standing up their HR data visualization programs.

RECOMMENDATIONS

GOVERNMENT LEAD



WHAT IS THE ROLE OF THE GOVERNMENT LEAD IN IMPLEMENTING THE SERVICES?

A government lead that is best positioned to drive these services is one with knowledge of the federal HR space, including knowledge of data standards, data sources, as well as established relationships with agencies, the CHCO Council, and payroll providers. OPM and the HR QSMO are examples of government leads with the required knowledge and influence to drive these services. The government lead can implement or support these services by considering the following activities.

See the [alternative implementation recommendation](#), in which HR providers might implement the recommended services.

1. INFUSE DATA STANDARDS IN DASHBOARD TEMPLATES

OPM, in its role as the chief human resources agency and personnel policy manager, creates and maintains standards for human capital management. The Human Capital Information Model ([HCIM](#)), housed on the OPM Human Resources Line of Business (HRLOB) Max.gov Data Collaboration Site, is home to the data standards that support the sub-components of the Human Capital Business Reference Model ([HCBRM](#)) and associated Federal Integrated Business Framework ([FIBF](#)).

The HRLOB data standards and common data dictionaries set the foundation for agency use and interpretation of data elements. These data standards forged the path for standardization in federal HR analytics and laid the groundwork for this pilot effort, which were able to serve the data visualization needs of several agencies due to previous collaboration between OPM and HR providers to create and implement these standards. While agencies may interpret OPM standards and HR data elements differently due to differences in business need, the OPM standards serve as the best starting point for any HR dashboard effort.

All three data visualization services can incorporate these data standards, and agencies will be incentivized to adhere more strictly to the same interpretation of OPM data standards. By ensuring that any dashboard templates or data visualizations provided by this effort adhere to these standards, agency decision support tools government-wide would stem from a common point endorsed by OPM.

[See the Agency section](#) and [the HR Providers section](#) of this report for more detail on the challenges agencies and HR providers face when incorporating and adhering to OPM data standards and guidelines.

RECOMMENDATIONS

GOVERNMENT LEAD

2. SUPPORT MULTIPLE DATA VISUALIZATION TOOLS

OPM is transitioning to Power BI as their BI tool of choice, including transitioning USA Staffing data from COGNOS to Power BI. At the time of this report's publication, OPM has not made this transition. Once complete, the impact of the transition on these recommendations may need to be assessed.

Currently, most federal agencies that perform advanced data analytics use either Power BI or Tableau as their preferred data visualization tool. However, the government lead could source templates for any popular, modern data visualization tools used by agencies, such as Tableau or Power BI. By hosting – or encouraging the sharing of – similar templates in several tools, the government lead can identify best-in-class HR products across the federal government, allowing them to be technology neutral while still realizing the returns of sharing best practices across most, if not all, federal agencies.

3. PROMOTE TEMPLATES ACROSS THE HCBRM

While the CDO Council pilot focused on descriptive statistics and trends on workforce demographics, through human-centered design sessions, we discovered that our stakeholder agencies are interested in understanding and visualizing additional workforce data across the HCBRM.

Because USA Staffing is the federal government's talent acquisition system used by more than 70 agencies, a "quick win" topic for HR dashboards might be a hiring and talent acquisition dashboard using USA Staffing as the data source. For example, USDA is a USA Staffing customer and uses this data for its Time-to-Hire dashboard, which provides critical hiring information including average time-to-hire, number of completed and in-process recruitments, and USDA recruitment information relative to OPM standards. This could be one of many dashboard templates that the government lead sources and builds upon.

We recommend that the government lead also promote dashboard templates for all areas of the HCBRM – not just talent acquisition – spanning topics such as workforce composition and diversity, performance management, hiring and separation activities, training and development, employee timekeeping, certificate analysis, and more. OPM's data standards, which cover all HR processes, can support each of these subject areas.

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4. CONSIDER SEVERAL DATA SOURCES FOR THE AUTHENTICATED SERVICE (SERVICE #2)

As detailed in the [recommendations overview](#), the government lead should assess several data sources to feed the recommended dashboard service. We recommend the following data sources to begin the dashboarding effort: the EHRI Statistical Data Mart (EHRI-SDM) which feeds FedScope; FEVS; federal employment reports; and assessment and hiring data from Monster.com. Other data sources may also be appropriate to include.

The government lead should ask agencies if they are interested in a) participating in the service and b) having their data be part of this service. Agencies have the option to opt out of the program, even if the government lead has access to its data.

Additionally, the government lead should consider establishing agreements with agencies and HR providers to visualize payroll and personnel data, allowing the government lead to develop dashboards for additional subject areas using automated data feeds from HR providers. Otherwise, using only data that is made public quarterly (such as FedScope) may not be as valuable to agencies. For our pilot effort, we visualized the Diversity Profile dashboard comparisons using National Finance Center (NFC) personnel data, which could be automated on a biweekly basis. We received positive feedback from stakeholders that a frequent, automated data feed from their HR provider or other HR system of record is critical to effectively analyzing current HR data. Lessons learned from our pilot in connecting HR provider data can be found in [tHR providers section](#)he.

5. FACILITATE COLLABORATIVE ROUNDTABLE SESSIONS TO ENCOURAGE SHARING BEST PRACTICES

The government lead can leverage standing relationships with government-wide councils, including the CHCO Council and Chief Learning Officers Council, to facilitate recurring roundtable discussions. In these sessions, CHCO and CDO representatives from agencies with advanced human capital analytics capabilities could demonstrate their dashboard tools and share best practices in a collaborative forum.

Recognizing that OPM has hosted forums with HR providers, such as NFC, IBC, and ARC before, the government lead could host similar sessions with a renewed focus on the solutions provided in this report. This collaboration will benefit the federal government, HR providers, and agencies by bringing forward and aligning federal HR

Section continued on next page

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stakeholders on new HR modernization efforts such as standardizing HR data analytics tools and exposing APIs for easier customer data extraction. The government lead could also establish a new roundtable series for agency collaboration or leverage existing meetings or strategy sessions with agencies. In these sessions, agencies can demonstrate their dashboards and analytics tools and discuss the resulting business impacts or business decisions informed by these dashboards, such as retention or recruitment strategies employed by the organization.



Through these regular sessions, the government lead could identify the agencies with dashboards that are the best candidates for inclusion in their dashboard suite. These dashboards should cover topics across the HCBRM – for example, the lead may recognize that one agency’s performance management dashboard should be leveraged, and another’s certificate analysis dashboard is best-in-class. The government lead could coordinate agency submission of these dashboards and adjust them based on feedback gathered in the demonstration sessions to ensure they meet broader agency needs and leadership goals, including adhering to data standards. These dashboards would then serve as the gold standard for other agencies.

The government lead could also collect strategies and suggestions from top agencies according to the different HR metrics (e.g., best time-to-hire) to share and display to the end users of their visualizations in the form of dynamic callouts, as [mentioned previously](#). The government lead could consider hosting various roundtables for cohorts of similar agencies in order to facilitate conversations on HR strategies among agencies of similar size and mission.

Participating agencies would immediately reap the benefits of engaging in these sessions by learning strategies directly from their peers. Agencies could help shape future dashboard templates, and the continued collaboration would improve final products for end users. Agency stakeholders could also help prioritize dashboards and dashboard enhancements for future releases. Furthermore, these sessions facilitate agency conversation around how to effectively use the new and existing services being offered, creating allies that will champion the adoption of these tools.

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6. HOST DATA ANALYTICS INFRASTRUCTURE FOR DASHBOARD TEMPLATE SHARING AND PAID SERVICES

To integrate this data visualization standardization effort with OPM's data standardization efforts, we recommend hosting the dashboard templates (service #1) on Max.gov, alongside other HCIM products, for agencies to download. HR professionals across the government could access this secure website via login to download dashboard templates free of charge.

Alternatively, the government lead could establish and manage a private GitHub page for the same purpose. GitHub received FedRAMP operating authority in 2019, and [according to GitHub](#), over 150 federal civilian agencies, 18 Department of Defense agencies, and 49 state agencies leverage GitHub to collaborate. The government lead would determine the appropriate controls for this repository, including whether agencies could freely upload templates or whether the lead would review and revise templates to align with OPM data standards prior to approving posting for agency download from the site.

For the authenticated dashboard service (service #2), the government lead may consider hosting the customer-facing portal on the Max.gov HRLOB data collaboration site as its own tab. If a federal employee has the necessary permissions as a paid customer of the service, they could log in to view production dashboards populated with their data and comparison views. Potentially, they could add their own data via Excel upload to see the dashboard populated with data that the government lead does not have access to, and then save, download a static view, or share a live link with their teams or leadership.

Also, for service #2, the government lead would need to establish the necessary technical infrastructure on the back-end of the customer-facing Max.gov portal to ingest, host, and automate data feeds using a cloud platform. The government lead could leverage their own server for the data visualizations, such as OPM using its Power BI server.

While this infrastructure would primarily support the authenticated service and comparison dashboards, the government lead could consider offering access to this cloud platform as part of the ad-hoc analytics support service (service #3) for agencies that do not have the technical infrastructure established. The government lead could recuperate costs from establishing this platform.

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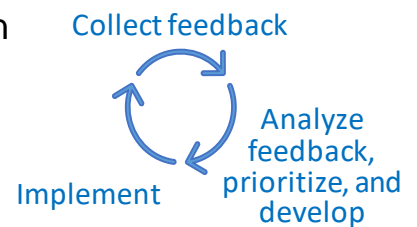
7. FEDERAL HR ANALYTICS IMPLEMENTATIONS REQUIRE CHANGE MANAGEMENT AND FEEDBACK MECHANISMS

A coordinated change management approach is integral to any digital transformation, including the implementation of any of the recommended HR data analytics services. The right change management activities ensure the success of the new HR analytics solutions and how agencies implement them in their organizations.

In the context of implementing the data analytics solutions discussed in this report, change management would include engaging stakeholders across the HR community to increase awareness of the services, solicit their feedback, and ensure the services meet their needs – therefore gaining their buy-in and continued use of the products.

STAKEHOLDER ENGAGEMENT

For this effort, stakeholders could be engaged through roundtable sessions, focus groups, and feedback forums on the dashboard templates and visualization services. In addition to soliciting feedback from agencies through in-person sessions such as roundtables, the government lead could request feedback from agencies through a feedback form, such as the HCIM Wish List, to further solicit the voice of the customer.



COMMS

A variety of communications channels can be used to build awareness. USDA has found success in newsletters discussing new dashboards with internal stakeholders. The government lead could consider a newsletter that is delivered to HR providers and agencies on a recurring basis to inform them of new dashboard templates added to the suite, as well as any new services being offered. Garnering agency and HR provider awareness and interest is paramount to the success of these services. Additional communications channel suggestions can be found in the [appendix](#).



LEARNING & SUCCESS

Particularly relevant for dashboard implementations are enabling user learning and measuring dashboard success. The government lead can consider developing tools and resources to train users on how to use the dashboard templates (service #1) or paid services (service #2 and #3), like recorded demonstrations, dashboard user guides and job aids, FAQs, and training courses. We also recommend that the government lead track HR dashboard usage and user engagement. More details on success measurement are in the [appendix](#).



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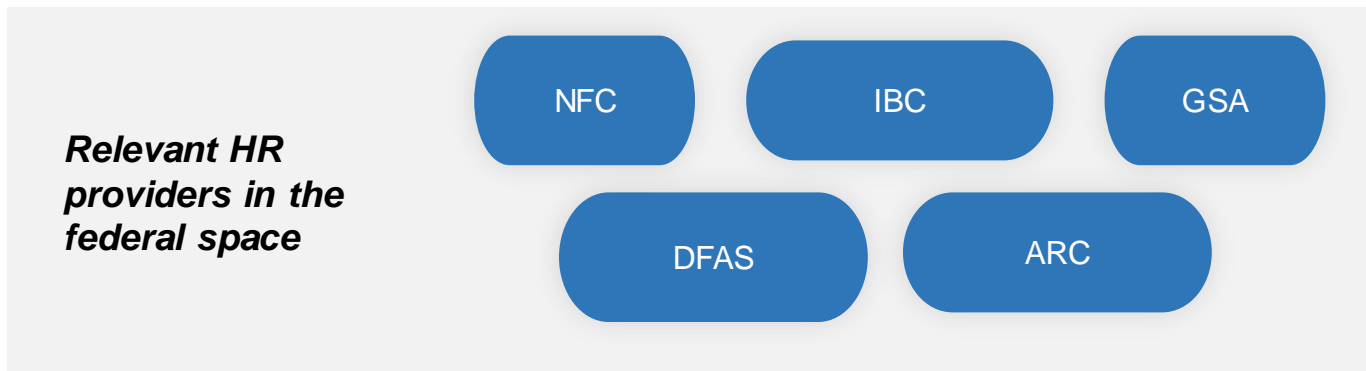
HR and Payroll

WHAT IS THE ROLE OF HR PROVIDERS IN IMPLEMENTING THESE SERVICES?

With guidance from the government lead managing the core services, HR providers can support the implementation of the recommended HR services. HR providers are also uniquely positioned to implement the core services because of their proximity to and relationship with customer agencies and payroll data. Through these relationships, they can work directly with the customer agencies. Furthermore, they have more familiarity with their payroll data, which can aid in ensuring correct implementation of data standards.

FEDERAL HR PROVIDER LANDSCAPE

Before discussing how HR providers can support the implementation of the core dashboard services discussed in this report, we should first discuss the HR provider landscape. There are five notable providers in the federal HR space.



- The first four in the table on the next slide (NFC, IBC, GSA, and DFAS) are considered legacy e-payroll providers.
- The NFC, IBC, GSA, and ARC are the four federal shared service providers that provide human resources management and payroll services for agencies across the federal government.
- DFAS oversees payments to DOD servicemembers, employees, vendors, and contractors. It is not considered a shared service provider because it performs payroll processing only for DOD.

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HR Provider	Shared Service Provider?	Organizational Overview	Customers
National Finance Center (NFC)	Yes	Two Lines of Business (LOBs): <ul style="list-style-type: none"> • Human Resources (HR) / Payroll • Financial Services 	Provides payroll and human resources management services for more than 170 federal entities and over 650,000 federal employees, including 8 CFO Act Agencies: Homeland Security, Justice, Commerce, Labor, HUD, VA, USDA, USDT, and USAID
Interior Business Center (IBC)	Yes	Three LOBs: <ul style="list-style-type: none"> • Financial Management • HR / Payroll • Acquisitions 	Serves over 150 federal organizations including 8 CFO Act Agencies: Interior, Education, NASA, NSF, NFC, EPA, SSA, and Transportation
General Services Admin (GSA)	Yes	Seven LOBs: <ul style="list-style-type: none"> • Buying & Selling • Real Estate • Policy Regulations • Shared Services • Small Business • Travel • Technology 	Provides compensation management for 52 government entities, including 2 CFO Act Agencies: GSA and OPM
Defense Finance & Accounting Services (DFAS)	No	Provides payment services	Pays all DoD military, retirees, and annuitants
Administrative Resource Center (ARC)	Yes	Five LOBs: <ul style="list-style-type: none"> • Financial management • HR • IT • Procurement • Travel 	Provides front-end Peoplesoft CORE system (HR Connect) and personnel, payroll, and benefits for 33 organizations, including HUD, the National Archives, and Office of Government Ethics

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USDA's agencies use NFC's payroll services as NFC is housed within USDA. USDT and USAID also use NFC, although USAID in particular handles payroll and other personnel management for its Foreign Service in other systems and DOT uses IBC.

1. CONSIDER ENHANCING EXISTING SERVICES WITH RECOMMENDED DATA VISUALIZATION SERVICES

HR providers should also consider incorporating the recommendations in this report into the HR services that they offer customers. For example, HR providers might enhance the dashboards that they provide today by sourcing best-in-class Power BI and Tableau templates from agencies; hosting feedback forums and roundtable conversations among agencies for sharing best practice HR strategies; and adding comparison views for similar agencies within their customer pool. In this way, HR providers can realize additional business opportunities while supporting OPM data standardization efforts and advancing data analytics maturity for customer agencies.

An advantage of this approach is that HR providers are closest to the data and their agency customers. A government lead may not have real-time access to data without partnering with OPM for data connections or without establishing Interconnection Security Agreements (ISAs) with HR providers, since the ISA would allow the government lead to create new connections to HR provider systems that did not previously exist. HR providers, on the other hand, would be able to more immediately provide data that is up-to-date.

HR providers likely have the technical infrastructure and the customer agreements in place to quickly stand up, or enhance existing, data visualization services. HR providers could integrate the templates with a data feed from their own system of record, creating synergies and ease of access for agencies. In this case, OPM's framework would still serve as the authoritative data standards to influence the dashboard templates and agency comparison data visualizations. HR providers should incorporate OPM's data standards into the templates they source and share for customer use. Additionally, if the templates are made available by each HR provider, they may more closely resemble the data elements that the agency is used to receiving from their HR provider, causing less rework in adjusting the templates for their own needs.

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However, the differences in how each HR provider implements the templates could cause disparities government-wide based on the providers' preferences and business models, and efforts would still be duplicated by each HR provider. Although this could partially eclipse the goal of a government-wide standardization effort, there are still many benefits to HR providers implementing the recommended services. In addition to those benefits described above, it would also reduce duplicative and siloed development efforts, facilitate sharing of best practices, and lend to improved decision-making for individual customer agencies.

2. SUPPORT DATA STANDARDIZATION AND SECURITY

Although there are steps agencies can take to standardize their data according to OPM's standards, HR providers can play an integral role in facilitating the collaboration of their customers by ensuring they are speaking the same language in terms of data elements, records, schedules, and more. HR providers can support consistency and standardization by providing clear connections from OPM data standards to the data in their HR systems. For example, OPM shares guidance on how HR providers and agencies should designate an employee's ethnicity or race. HR providers can then draw the line for agencies, e.g., Agency A might require a specific field from NFC INSIGHT in order to retrieve the employee designation.

We recommend that HR providers perform an analysis of its data systems and, if one does not exist, create a data dictionary for the data in each of its HR systems, detailing this data mapping between HR systems and OPM standards. As mentioned in the [Agency section](#), we also recommend that HR providers work with customer agencies to surface data incongruencies to OPM. This collaboration between HR providers and agencies will assist OPM, HR providers, and agencies in aligning on how to improve data standard usage across the government for future federal dashboarding efforts.

Additionally, HR providers can support the protection of customer data through permissions by providing recommendations to agencies for who in their organization should have access to data. For example, dashboards that contain publicly available data may contain very few, low-level access restrictions. Alternatively, very sensitive data should be restricted only to elevated agency HR groups. Access to an elevated permissions group could be determined by agency leadership, including HR leaderships and ACDOs, on an as-needed basis.

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3. LEVERAGE PILOT DATA ACCESS LESSONS LEARNED TO SUPPORT FUTURE DATA SHARING EFFORTS

The team worked with NFC and USDA Information Security Center stakeholders to establish a process for sharing NFC customer data with another NFC customer. This process did not exist prior to the pilot effort but following the below steps could streamline future cross-agency HR provider data access.

- 1 Determine need for an Interconnection Security Agreement (ISA) or Memorandum of Understanding (MOU) in order to receive access to USDT and USAID data, via an existing NFC connection, for ingestion into USDA's data lake. For the purposes of this pilot, we determined that a MOU was the appropriate document to establish an agreement between relevant parties: one MOU between USDA and the USDT, and one MOU between USDA and USAID.
- 2 Review System of Records Notices (SORNs) for the systems involved in data sharing to ensure the use case being pursued is covered by the SORN. In the pilot case, the USDA data lake uses the NFC SORN; the team determined that agency data sharing was appropriate under this SORN. The team shared the SORN with USDT and USAID for their confirmation.
- 3 Discuss and finalize the data that each agency would grant the team access to, including which data elements to pull (what we pull at USDA vs. what USDT and USAID were willing to provide access to at this time, balancing data privacy with the desire to advance the pilot and collaborative federal HR analytics.)
- 4 Keeping data privacy and security in mind, the MOU documents and list of approved data elements required several revisions to ensure USAID, USDT, and USDA aligned on the process for transferring sensitive HR data.
- 5 Submit final signed MOU. In parallel, determine type of access needed to NFC (for example, a general service account or single named user with permissions). For this pilot, a single named user account was granted access.
- 6 Submit NFC access form (AD-3100), indicating the NFC subject areas required.
- 7 NFC access granted to the requested subject areas.
- 8 Create NFC INSIGHT reports to pull agreed-upon data elements; if applicable, establish automated data feeds. In this pilot, we intended to ingest and host stakeholder data in EDAPT, connecting to the Tableau server and dashboard. However, pilot time constraints resulted in a one-time, static data pull instead.
- 9 Test NFC data access to ensure all data elements are available. Make necessary updates to data access and NFC reports as needed.

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While our team had a clear understanding of the data access steps through our USDA HR dashboarding experience, the pilot data access still took longer than expected – nearly 3.5 months into the project schedule. This caused a delay in developing the Diversity Profile dashboard and required a project extension. Future cross-agency data sharing efforts should plan ample time into project schedules but can use the pilot lessons learned to streamline data access.

The pilot highlights that technical infrastructure is only one piece to the puzzle – in order to quickly implement the recommended services, a technology approach must be paired with a streamlined approval process that ensures the security and privacy of agency data. HR providers should establish these procedures with agencies to lay the groundwork for future data visualization efforts.

As part of the security and approvals procedures, HR providers could offer templates for various data access forms. For example, a boilerplate MOU based on the ones used in this pilot could be provided to a government lead aid in connecting HR provider data sources for the recommended service #2.

Additionally, HR providers could provide templates for data access forms, pre-populated with recommended data elements or subject areas based on the desired analysis. Our pilot team was able to quickly complete the NFC AD-3100 form that granted data access to the appropriate subject areas due to our USDA HR dashboarding experience. However, it required mapping access form elements to NFC subject areas and coordinating with NFC personnel to confirm our form selections. HR providers can streamline the completion of this form – and similar data access forms – by 1) providing a job aid that clearly indicates which form selections correlate to the desired subject areas or data elements and 2) providing standardized templates for forms like the AD-3100. For example, if a government lead or individual customer agency requires access to demographic data to display diversity trends over time, NFC and other HR providers could provide a template that includes the appropriate Workforce and Personnel History subject areas already selected.

HR providers would still need to coordinate with agency analytics and security officials to ensure that the templates meet their needs, but a standardized template would provide a starting point to ensure agencies are granted the correct access with minimal back-and-forth.

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4. SUPPORT DATA ANALYTICS BY MITIGATING DATA ACCESS CHALLENGES FACED BY CUSTOMERS

A critical aspect of effective data analytics, including functioning dashboards, is how the data is accessed and feeds into data visualizations or predictive models.

The main challenge faced during this pilot was gaining access to data from multiple agencies. This cross-agency collaboration required HR providers to create and work through new processes. As a result, the pilot data access process informed our understanding of additional challenges that individual agencies may face in accessing their HR data.

Through this pilot, we learned that NFC customers encounter challenges in efficiently accessing their data. While this section will mainly discuss the challenges that NFC customers face, NFC is only a case study for a problem that is prevalent for HR providers government-wide.

For NFC customers, two preferred options for data access are:

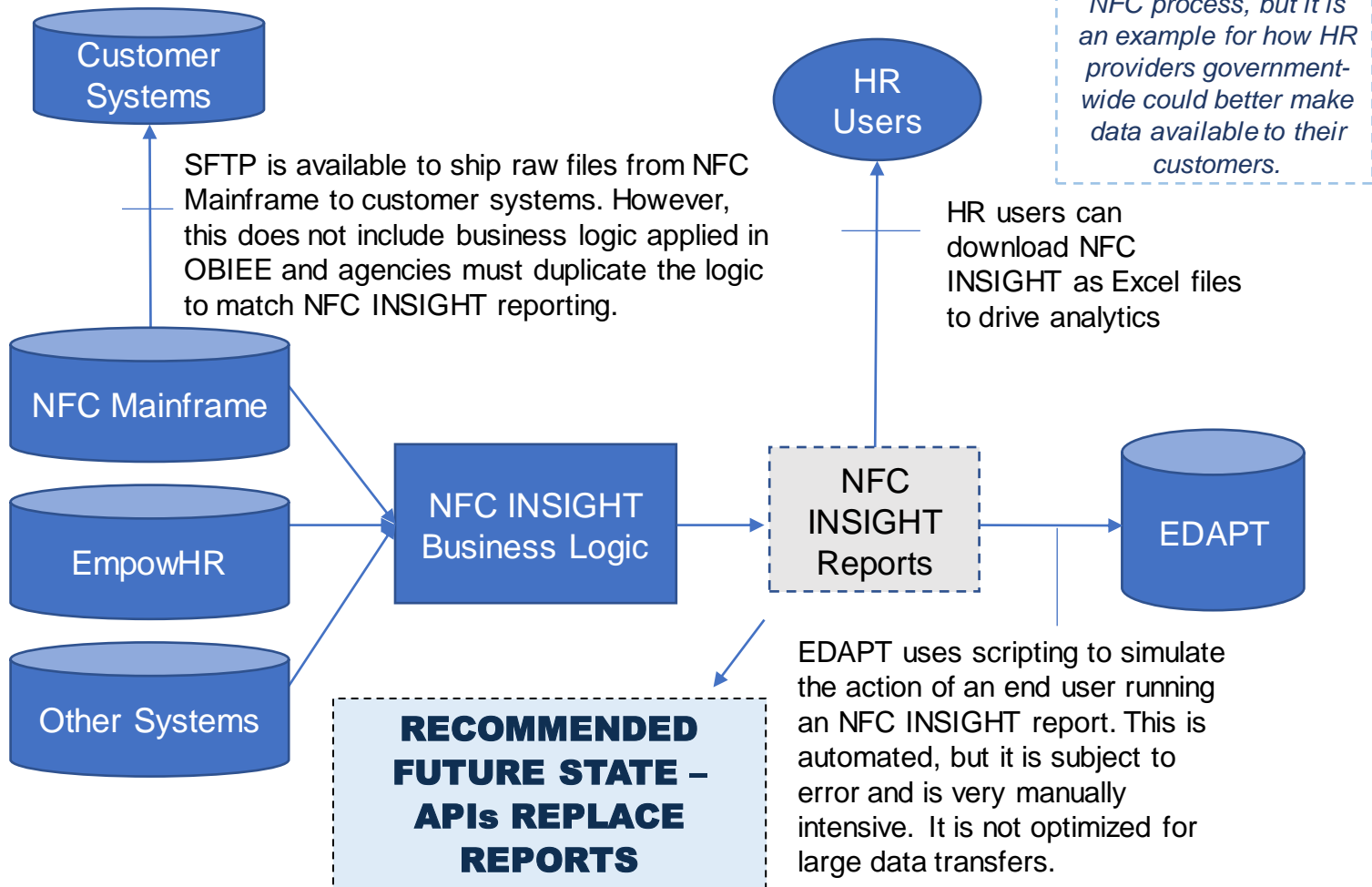
1. Data from NFC INSIGHT, customizable in reports
2. Raw data files from NFC Mainframe

These options are depicted in the diagram on [the next slide](#). Currently, the way USDA accesses its NFC data is through reports from NFC INSIGHT that have data fields calculated from raw NFC Mainframe data and other sources. These reports are extracted from NFC INSIGHT, transformed and loaded into EDAPT, USDA's Data Lake, allowing USDA to visualize this data in the HR dashboards. The reports are automated, refreshing both the data and the resulting dashboards each pay period. One limitation of these custom reports in NFC INSIGHT is the significant manual labor required for modification. When adding or modifying report columns, it can take several hours to update the reports, redownload them, and load them into EDAPT. Additionally, when INSIGHT is down or a report displays errors, it can cause the data ingest to break, directly impacting dashboards and data available to over 10,000 users.

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Alternatively, NFC customers could access data from the NFC Mainframe, which only hosts raw HR data and does not provide the calculations and data processing that the NFC INSIGHT data does. USDA dashboards are currently developed based on the calculated data in INSIGHT, which matches the calculated data fields that USDA agencies are pulling from NFC INSIGHT. If the USDA dashboard development team were to access the Mainframe data, they would need to replicate all existing calculations that NFC makes in NFC INSIGHT, which would require substantial manpower and coordinated effort. Therefore, without mirroring the exact calculations from NFC, the data provided from Mainframe would be inconsistent with the data HR users across the department are expecting to see. Additionally, if any of the calculations were to be changed in the future, they would be reliant on NFC to make them aware of those changes in order to apply them to the data accordingly, as they are mapped to the USDA dashboards and pulled by HR users across the department.

CURRENT STATE NFC CUSTOMER DATA ACCESS



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RECOMMENDED FUTURE STATE FOR CUSTOMER DATA ACCESS – APIs REPLACE MANUAL REPORTING

The pilot process to access additional agency data confirmed the challenge of agencies' inability to quickly access HR data. While our pilot introduced a new scenario to HR providers (USDA accessing USAID and USDT data on their behalf), it confirmed that the most difficult aspect of visualizing a shared agency decision support tool was accessing the data.

We learned that other agencies have similar connections to HR providers as USDA does with NFC. DOT, an IBC customer, accesses their reports manually via an IBC Oracle Business Intelligence Suite Enterprise Edition (OBIEE) implementation. This is the same application supporting NFC INSIGHT. This highlights the complexity and challenges of being able to quickly access HR data as a customer of federal HR providers.

To mitigate these data access barriers, we recommend that for agency-specific access, HR providers develop and implement APIs so that agency customers can more quickly and reliably pull down their data from systems like NFC INSIGHT. With these APIs, analytics practitioners could interface directly with the NFC INSIGHT database programmatically via queries; the key advantage of this would be enabling users to write reusable and easily modifiable queries that can pull down data from a specified period. Currently, users manually create time consuming NFC INSIGHT reports per each time span, and any changes require manually reconfiguring every time span instance of that report. With a query, the change would only need to be implemented once. EDAPT would also be able to connect to these APIs to automate large data transfers from NFC to EDAPT.

OPM is currently working on establishing APIs for USA Staffing customers. It is a best practice that would allow customers of all federal HR providers to avoid much of the friction described above. Instead, it would help them access their data with ease, enabling them to more efficiently and effectively analyze and visualize their data in mission-critical dashboards.

However, HR providers must keep in mind privacy and security considerations when implementing APIs. HR Providers should ensure the API uses HTTPS protocol and could add some form of authentication for additional security, particularly for PII data.

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WHAT CAN FEDERAL AGENCIES DO TO SUPPORT, AND PARTICIPATE IN, THE RECOMMENDED SERVICES?

Individual agencies can participate in and capitalize on the data visualization offerings in order to support OPM's government-wide data standardization efforts and ultimately improve their own organization's HR decision-making. Performing the activities described in the following slides will prepare them to efficiently and effectively address emergent HR needs.

1. ASSESS AND INTEGRATE AGENCY HR DATA SOURCES FOR THE END-TO-END EMPLOYEE LIFECYCLE

Agencies often manage data from several disparate talent management systems. For example, USDT and USAID leverage systems such as:

Examples of disparate data sources within a single agency

HR
Connect

SAP
SuccessFactors

USA
Staffing

Oracle
PeopleSoft

Monster Career
Connector

...and more

USAID faces unique challenges in this area, with civilian employees stateside and Foreign Service resources (both direct employees and contractors) overseas, and all this information tracked in separate systems. USAID is working to implement a talent analytics tool to integrate data from these disparate systems, but it has not yet been rolled out at the time of this report.

Our pilot used NFC INSIGHT data for the proof of concept due to USDA's existing relationship with the organization. USAID, USDT, and USDA are customers of NFC, so we were able to easily use their workforce profile data. However, USAID and many other agencies use several HR systems. If agencies desire to have other data sources or systems of record visualized, additional connections to the data would need to be established in order to create a more holistic picture of their workforce.

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2. DEVELOP DATA DICTIONARIES AND PERFORM DATA MAPPING TO STANDARDIZE DATA

Inventoring data from disparate systems is an important piece in gathering and integrating data from various sources. Agencies must also consider the uniformity of their data across systems, as the government lead will notice disparities in how data elements are managed or interpreted across different agencies.

For example, although one might believe data from USA Staffing would be uniform, different agencies may interpret data elements from USA Staffing differently or use them according to their business needs rather than the field label or definition. While beginning development on the Time-to-Hire Dashboard at USDA, it became apparent that Mission Areas across the department were utilizing USA Staffing differently, including using different milestone dates to capture the hiring process and opting into select modules. It was evident that there was a need to standardize time-to-hire milestones, tracking, and metrics across the department to prevent continued inconsistencies in the data. Following collaboration with the OPM to develop a custom report in USA Staffing to track time-to-hire, the USDA team developed the Time-to-Hire Data Standards document to provide information about the source report used in the dashboard, define data fields from USA Staffing, delineate milestone dates in the hiring process, and outline key dashboard calculations. As a result, the data standards document serves as a guide to the USA Staffing data and calculations used in the dashboard to ensure this critical USDA hiring information is consistent and accurate across the department, thus streamlining internal USDA and external OPM reporting and allowing supervisors to more efficiently manage their hiring activities. The document was shared broadly across the organization and is embedded into the dashboard so that anyone who views the dashboard can also access the data standards documentation. Furthermore, conversations among the Office of Human Resources Management (OHRM) leadership, Mission Area CHCOs, and HR specialists were essential in establishing concurrence and adoption of the data standards. While there can still be flexibility to meet individual business needs, this process and standards document is considered a USDA best practice that other agencies may consider employing.

While coordinating with USAID on the data elements to be ingested into the USDA Data Lake for this pilot, before beginning dashboard development, the team identified another example applicable to NFC INSIGHT's data: While USDA treats Org Code

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Level 2 as the bureau or agency level, USAID uses the Org Code Level 2 field to indicate Overseas vs. Washington, D.C., employees. USAID also utilizes the Personnel Office Identifier (POI) code to organize its employee hiring mechanisms, which is a field that USDA does not use. These examples indicate that although there may be data standards set forth by OPM, and one might expect the data elements from the same HR provider to align, there are always challenges in how these are implemented and differences in data element use and interpretation. While standard dashboard templates can be created, this indicates that agencies will still need to customize dashboard templates to meet their unique requirements.

This is a widespread challenge to the success of a standardized dashboard – every department integrating data sources experiences this, as they realize their agencies use fields differently to meet their unique business needs. This also becomes apparent when agencies compare the OPM data standards to what is provided by HR providers, as there are incongruencies in definitions and calculations.

We recommend that each agency perform an analysis of its data systems and, if one does not exist, create a data dictionary for the data in each of its HR systems. For government-wide systems such as USA Staffing or Monster, or for data from shared service providers such as NFC or IBC, we recommend that agencies surface data incongruencies to OPM or the government lead of the services recommended in this report. This will create transparency on how agencies use data standards and how they may tailor them to meet their needs – not only encouraging alignment to data standards but understanding why agencies may interpret those standards differently. This continuous collaboration will assist OPM and agencies in aligning on how to improve data standard usage across the government for future federal dashboarding efforts.

3. ESTABLISH OR IDENTIFY APPROPRIATE DATA PLATFORM OR TECHNOLOGY INFRASTRUCTURE

USDA needed one dynamic solution that integrated disparate data from systems across its 29 agencies and staff offices. USDA required a solution that could not only host data, but ensure that the data was secure, accessible, consistent, and could be rapidly transformed into effective reporting for key performance indicators, metrics, and other data critical for decision-making. To address this need, the USDA Enterprise Analytics Platform and Toolset (EDAPT) emerged as a solution to ingest, store, translate, and transform data management to reorient and position the USDA to succeed in an ever-changing customer experience landscape.

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If agencies were to download new HR dashboard templates from the recommended government-wide service, they would need to stand up a mature infrastructure to support automated HR dashboards. A solution like this would also help agencies, or departments, merge their own disparate data sources.

Agencies could utilize an existing platform or implement one of their own with connections to their HR provider data, similarly to how the CDO Council team used the USDA data lake (EDAPT) in this pilot. Some agencies may already have existing technical infrastructure that could expedite implementation, whereas for others, it might require significant time and cost for implementation. Even if the government lead or HR providers also host their own infrastructure for agency use, agencies may still choose to establish their own. The key benefits of doing so include security and the ability to restrict the sharing of data externally; autonomy and ease of customization and integration of the stack; and, perhaps most compelling, the ability for HR data to enrich many other analyses beyond just feeding data visualizations, in a way that is not possible with a government lead environment that would include strictly HR data. For example, in EDAPT, USDA can overlay HR data with programmatic data to understand how HR is impacting their program delivery. It can overlay HR data with financial data to understand salary and expenses (S&E) budgets.

To establish their own infrastructure, agencies would need to procure a service such as AWS and coordinate with their HR provider to create the appropriate connections. This may involve setting up a secure file transfer protocol, interconnection, and synchronous or asynchronous data flow (as desired for continuous data ingestion or at a set interval, such as after each pay period). While we recommend APIs with at least an asynchronous data flow after each pay period, to ensure the latest data is ingested into a data lake and displayed in these dashboards, it may depend on the agency and HR provider capabilities.

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4. SELECT DATA VISUALIZATION TOOL

If the agency chooses to leverage the shared dashboards (service #1), we recommend that agency select one of the modern data visualization tools that are popular across commercial enterprises and federal government alike, such as Power BI or Tableau, as their data visualization tool of choice.

As mentioned in [the government lead section](#), most federal agencies that perform advanced data analytics use either Power BI or Tableau as their preferred data visualization tool. However, some use tools like Google Data Studio or Looker. While agencies should select the tool that meets their own requirements, they should consider the templates that are available via service #1. If there are more templates available in a certain tool for agencies to choose from, it is more likely that they will find templates that best suit their needs. This will also create more opportunity for government-wide efficiencies: if agencies select one of the popular tools used by other agencies, more data visualization best practices can be shared between agencies using the same tool. Additionally, the majority of the federal government would be able to access a template in their preferred data visualization tool, rather than duplicate development efforts in parallel with other agencies.

5. COLLABORATE WITH DATA ANALYTICS AND HR STAFF

If templates are made available, agencies looking to leverage them must staff data scientists or analysts who have the skills necessary to clean their agency's data to fit the dashboard templates and/or customize the templates as needed to suit their data.

Additionally, there must be coordination between data scientists and HR staff with subject matter expertise. Often, data issues are not recognized until HR staff and data analysts collaborate – HR staff does not always have the data analytics expertise and data analysts do not have the HR expertise to understand how the data is used in practice. We recommend frequent collaboration between these groups as well as training both groups on basic HR knowledge and data analytics terminology. This helps them to 'speak the same language' and identify data incongruencies more quickly – ensuring the dashboards are accurate.

Finally, HR professionals should commit to ensuring accurate data is captured in HR systems that are feeding data visualizations. For example, if an employee's onboarding date changes but is not updated in one or all systems, the dashboard visualizing time-to-hire is no longer accurate. Encouraging these practices at the agency level will ultimately improve the dashboards that inform business decisions.

RECOMMENDATIONS AGENCIES

6. USE DATA ANALYTICS EFFECTIVELY IN HR PROCESSES

Once agencies have access to advanced HR decision support tools, they must learn to use them effectively. Agencies should consider training end users on data-driven decision-making. The dashboards are only effective if the users know how to interpret and use the data as part of their everyday operations.

AGENCY-LEVEL CHANGE MANAGEMENT WHEN IMPLEMENTING HR DASHBOARDS OR OPTING INTO HR DATA VISUALIZATION SERVICES

We recommend that these learning opportunities be part of a broader change management effort related to the implementation of the dashboards at each agency.

- We recommend communications and awareness campaigns to ensure end users are aware of and familiar with the dashboards and how to access them. A mix of methods is suggested – from newsletters to dashboard scavenger hunts, which are fun ways for users to engage with dashboards.
- We recommend establishing feedback mechanisms within the organization to improve the dashboards internally and/or share that feedback with OPM via the recommended online feedback form. These feedback mechanisms could include forms where the dashboards are housed, informal channels such as emails or word of mouth, data analytics focus groups, or HR change champion networks.
- We also recommend that agencies track usage and user engagement, developing success metrics based on dashboard usage (clicks) and end user feedback.

For example, USDA created a dashboard that displays usage for each of its dashboards in production. If there is a lack of engagement with a dashboard, the USDA analytics team investigates why staff is not using it. The team can then form and take next steps – such as more widely or clearly communicating a dashboard and its features to end users, decommissioning dashboards that are no longer useful, or enhancing a dashboard so that it better meets end user needs, therefore driving adoption.



Please see the [Government Lead section](#) and [appendix](#) for more details on efforts agencies can implement within their own organizations, in parallel with the government lead's change management efforts government-wide.

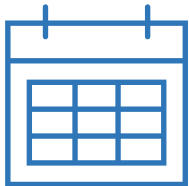
CULTIVATING A DATA-DRIVEN CULTURE IN THE HR COMMUNITY

Agencies should also embed data-driven decision-making into their HR processes, so that using the dashboards is not only done in certain situations or as an afterthought.

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RECOMMENDATIONS AGENCIES

Agency employees can participate in 10- or 30-Day Challenges in which they practice micro-habits through daily, manageable activities. These activities generally take 10 minutes or less each day and could be anything from locating a dashboard on an agency's internal site to reading an article to working with a colleague to find the information they need on a dashboard or job aid. Practicing micro-habits encourages and embeds the desired behavior (in this case, seeking and using data to inform HR



decisions, at all levels of the organization) into employee mindsets and therefore into an organization's shared way of working. These activities and challenges increase awareness of existing dashboards and features, keep them top-of-mind, improve user comfort with the tools, and ultimately drive employee behavior and overall culture as it relates to HR analytics.

Additionally, agencies must place an emphasis on encouraging employees to make data and discrepancies in data visible. Organizations tend to want to hide data that is not favorable or ignore gaps in the story the data tells. While this is understandable, it will only do the organization harm due to inaction. Agencies must highlight and raise these issues to their leaders so that they can be addressed. It is an opportunity to bring together HR, OCIO, the CDO officer, and all relevant stakeholders to align on actions that will rectify any problems illuminated by the HR data.

TAKING ACTION BASED ON THE DATA TRENDS

In honing these skills, agency employees will learn to use the dashboards to answer the HR questions they were implemented to aid. For example, if recruitment data trends show a lack of candidates who are of a certain age group, what should the organization do? What if retention for a diversity group is trending lower each year? What if the number of disabilities persons employed by your organization does not match civilian labor force comparisons?

Dashboards not only answer questions, but they also create action items informed by the data trends. Performance ratings across the organization might lead HR teams to investigate their performance management strategies. HR leadership can revisit their retention and recruitment strategies. The agency might consider employer rebranding to attract the candidates they lack in their recruiting pipeline. Staffing and recruiting teams might expand hiring pools. Hiring managers and program offices should take action as well – all actions based on the data trends visualized in these dashboards, of which agencies may not have otherwise been aware. Agencies should not only implement dashboards, but they should constantly practice using the presented data to inform their decision-making and create tangible, actionable next steps.



CONCLUSION

CONCLUSION

This pilot was successful in proving that agencies government-wide can benefit from efficiencies in standardized, best-in-class dashboards that can be shared and reused across the federal government. The team worked with several federal agencies to demonstrate that data from different agencies could be brought into a single dashboard, while maintaining each agency's requirements. The team also examined data access challenges related to a generalizable dashboard. This pilot also explored how a federal-wide HR analytics tool could support leadership's goal of advancing equity, while adhering to OPM's HCBRM and data standards and improving access to key HR metrics government-wide.

Building on the lessons learned in this pilot to implement federal-wide data sharing and decision support tools, we recommend that a government lead source best-in-class HR dashboard templates from agencies across the federal government and host them, in coordination with OPM data standards, as a service to all agencies. While agencies could download and adjust the templates as necessary to meet their own business needs, the templates would incorporate OPM data standards, therefore encouraging HR providers and agencies to adhere to the data standards while still allowing customization. This flexibility is important to account for unique mission or business needs.

We also recommend that a government lead offer a second service that allows agencies to access an HR dashboard that compares HR metrics and trends to agencies of similar size and mission. Roundtable meetings and feedback forums can support this service, facilitating discussion and leading to data insights and recommendations for HR strategies that may highlight areas for improvement illuminated by the data. Lastly, a third service could provide ad-hoc HR analytics support for agencies that desire additional dashboard assistance, but do not have a robust analytics team to support that.

Implementing all three of the core services is a multi-year effort. In the near term, the government lead would find immediate value in implementing service #1 by providing standardized dashboard templates to interested agencies. The lead could develop a longer-term implementation plan and timeline for services #2 and #3, establishing roles and responsibilities and a governance structure. In both the near and long term, these services would reduce duplicative development efforts and allow agencies to leverage the leading work of their peers, ultimately saving costs and improving key HR processes and metrics government-wide.



APPENDIX

APPENDIX

ADDITIONAL “TIPS AND TRICKS” TO SUPPORT AGENCY AND GOV-WIDE HR ANALYTICS IMPLEMENTATIONS

SUCCESS MEASUREMENT

Prior to implementing the dashboards and platform service, the government lead should determine what success looks like. These could be key performance indicators (KPIs) and success metrics based on usage (e.g., number of times downloaded per month) and user feedback.

We recommend that the government lead, and agencies, track usage and user engagement related to the available dashboards. Feedback collected through the Wish List, during roundtable sessions, and through any other formal or informal channels – should continuously be monitored to assess the success of the services. Additionally, feedback should be used to inform necessary updates to the change management approach, particularly if metrics are not meeting expectations. Feedback will also inform updates to the product itself, in order to continuously refine these solutions.



COMMUNICATIONS

The government lead could create a detailed communications plan to execute a coordinated awareness campaign to ensure agencies are aware of the new templates, standards, and data dictionaries.



For more impactful messages, consider the audience for each communication (e.g., HR providers, agencies) and select the most engaging channels for the audience, depending on the message to be shared, how much time the communicator has the audience’s attention for, and the tools that are available. [See the graphic on page 28](#) to consider a variety of channels for stakeholders.

These communications should include benefits of the tools, details on strategic business decisions that could be informed by these dashboards once implemented, FAQs, and more. These communications could be informed by roundtable discussions and outcomes, and they would be supplemented by roundtable attendees – de facto “change champions” – passing along these communications and sharing additional information with their peers by word of mouth.

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APPENDIX

ADDITIONAL COMMUNICATIONS CHANNELS

The HR community can consider the following communications channels to create awareness around the implementation of data visualization services government-wide or new dashboards at the individual agency level.



FAQs:

List of frequently asked questions and answers to address common questions related to the dashboards or services



E-mails, Newsletters, Bulletins:

Targeted communications aimed toward driving awareness and adoption of new dashboards, features, or services



Talking Points:

Defined messages to support conversations or meetings with agencies government-wide, employees at the agency level, or other stakeholders. For example, the gov. lead can share talking points along with templates if they want to influence how agencies talk about the dashboards to their HR staff.



Roadshow / Town Hall:

Roadshow presentations demoing new dashboards, features, or other topics related to the data visualization services (government-wide or at the agency level)



Communication Hub:

Central location to post updates and store repository of past communications (Teams, SharePoint, Intranet, Max.gov)



Surveys & Assessments:

Develop and distribute surveys to gather feedback or use assessments to determine where stakeholders are on the change curve; adjust communications and stakeholder engagement activities accordingly



Interviews:

In-person or virtual sessions with key stakeholders to build awareness, gather insights and best practices, and inform next steps



Office Hours:

Establish an open forum to gain buy-in, address concerns, and answer questions about dashboards, updates, or releases



Status Reports or Notifications:

Regularly occurring or ad-hoc newsletters or reports to update the intended audience on new dashboards and enhancements – applicable gov-wide and at the agency level



Video Messages / Webinars:

Executives present (live or pre-recorded) strategic communication to introduce and gain buy-in on the dashboard, especially at the agency level



Meetings / Workshops / Roundtables:

Collaborative session to address specific agenda topics: demo dashboards, prioritize enhancements, gather feedback, share best practices, etc.



Infographics and One Pagers:

Distribute short documents with text and visuals, such as charts, graphs, or screenshots, that can quickly convey information about a dashboard in a user-friendly and digestible format

APPENDIX

PILOT ENHANCEMENTS & FUTURE EFFORTS

Over the course of the pilot, we identified enhancements and opportunities that we recommend exploring.

PILOT HANDOFF: NEXT STEPS

- As a result of participation in this pilot, stakeholder agencies benefitted by receiving the resulting dashboard templates and the coding thereof to enable them to replicate and incorporate the templates as an augmentation to any of their existing human resources dashboards.
- ✓ This also allows participating agencies to continue testing and refining them for possible, eventual inclusion as a best-in-class template if implemented government-wide as a result of this pilot.

DIVERSITY PROFILE – PILOT DASHBOARD ENHANCEMENTS

- By collaborating with stakeholder agencies with existing Diversity Profile development efforts, our team identified several enhancements to our pilot dashboard that would incorporate best practices and meet additional agency needs for a more cross-agency, generalizable tool.
- Pilot time and scope did not allow for inclusion of all enhancements, but we recommend any agency government-wide incorporate these into a Diversity Profile dashboard.
- ✓ Show geographical representation of domestic and international employees in Diversity Profile
- ✓ Show diversity trends over time
- ✓ Use federal labor force comparison or Relevant CLF in addition to CLF comparison
- ✓ Show hiring and attrition trends of selected demographic groups over time

PILOT SCOPE EXPANSION OPPORTUNITIES

- If additional pilot or discovery efforts are considered, we recommend the following areas to investigate further.
- ✓ Additional data sources from current stakeholders (e.g., USAID's Foreign Service systems)
- ✓ Develop dashboards from additional HR providers (e.g., IBC)
- ✓ Power BI templates (in coordination with DOT and other agencies)
- ✓ Additional stakeholders (e.g., HUD)

ADDITIONAL DASHBOARDS

- Based on the use case prioritization session ranking results, stakeholders expressed interest in the HR dashboard topics areas to the right.
 - Based on the success of the proposed HR dashboard services, the government lead should also consider broadening available dashboards to additional functional areas such as finance, procurement, and fleet.
- HR dashboard topics:
- ✓ Performance Management
 - ✓ Training & Development
 - ✓ Talent Acquisition
 - ✓ Workforce Profile
 - ✓ Employee Locator
 - ✓ Separations & Transfers

APPENDIX

RELATED RESOURCES & LINKS

Below are resources and links that are related to this pilot and/or are referenced throughout this report.

THE WHITE HOUSE

[Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government](#)

[Executive Order on Diversity, Equity, Inclusion, and Accessibility in the Federal Workforce](#)

MAX.GOV

[Max.gov Portal Home](#)

[Human Resources Line of Business Home](#)

[Human Capital Business Reference Model](#)

[Human Capital Information Model](#)

[Federal Integrated Business Framework \(HC-FIBF\)](#)

GitHub and Government

[GitHub and Government information page](#)

[GitHub Government Community](#)

[GitHub FedRAMP tech briefing, 2019](#)



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Questions?

Please contact [Chris Alvares](#).