At a Glance

NSF Should Take Additional Steps to Ensure Compliance with the DATA Act

Report No. OIG 17-3-001 | November 29, 2016

Why we did this Inspection

The DATA Act requires federal agencies, including NSF, to report financial and payment data by May 2017. We conducted this review to determine whether NSF will likely meet the DATA Act requirements.

Inspection Results

The National Science Foundation (NSF) has made progress in implementing the Digital Accountability and Transparency Act of 2014 (DATA Act), but needs to take additional steps to strengthen its project management practices to ensure compliance with all reporting requirements. We could not determine whether NSF will meet the DATA Act's May 2017 reporting deadline because of external challenges, such as changes and delays in implementation guidance.

Recommendations

We recommend NSF strengthen its project management over DATA Act implementation by improving its Risk Management Plan, documenting and tracking risks, developing a Human Resource Plan, and documenting decisions timely.

Agency Response

NSF generally agreed with our recommendations, and recognized that there are opportunities to strengthen project management practices to help mitigate risks to DATA Act implementation. NSF stated it has already started implementing corrective actions for some of our recommendations, such as completing its Risk Management Plan.

NSF provided an alternative to our recommendation to develop a Human Resource Plan. In addition, NSF believes it has addressed our recommendation to regularly track and document the resolution status of data gaps and other project issues. However, we urge the agency to take additional steps to address these issues.

National Science Foundation • Office of Inspector General
4201 Wilson Boulevard, Suite I-1135, Arlington, Virginia 22230

MEMORANDUM

Date: November 29, 2016

To: Jose Munoz
Chief Technology Officer and Senior Accountable Official/DATA Act
National Science Foundation

From: Mark Bell
Assistant Inspector General
Office of Audits

Subject: *NSF Should Take Additional Steps to Ensure Compliance with the DATA Act,* Report No. 17-3-001

Attached please find the final report of our inspection of NSF's DATA Act implementation efforts. The report contains one finding and five recommendations designed to strengthen NSF's DATA Act project management. NSF generally agreed with our recommendations. We have included NSF's response as an appendix to the final report.

In accordance with OMB Circular A-50, Audit Follow-up, please provide our office with a written corrective action plan to address the report's recommendations. In addressing the report's recommendations, this corrective action plan should detail specific actions and associated milestone dates. Please provide the action plan within 60 calendar days of the date of this report.

We appreciate the courtesies and assistance provided by NSF staff during the inspection. If you have any questions, please contact Elizabeth Goebels, Performance Audits Lead, at (703) 292-8483.

Attachment

cc:

Martha Rubenstein	Joanne Tornow
Amy Northcutt	Charisse Carney-Nunes
Avinash Tembulkar	Gisele Holden
Christina Sarris	Emily Franko
Darrell Drake	Brian Gallagher
Kaitlin McDonald	Dorothy Aronson
Michael Sieverts	Antony DiGiovanni
Michael Wetklow	John Lynskey
Dale Bell	Jeff Lupis
Gregory Steigerwald	Allison Lerner
Marie Maguire	Louise Nelson
Laura Rainey	Andrei Pantchenko
Elizabeth Velo	Fae Korsmo
William Trinh	Teresa Grancorvitz
Hilary Shackelford	Teresa Guillot
John Anderson	Donna Butler
Michael Van Woert	Bill Kinser
Ann Bushmiller	Ken Chason
Elizabeth Sweetland	Sherrye McGregor

DATA Act Readiness Review

NSF Should Take Additional Steps to Ensure Compliance with the DATA Act

National Science Foundation
Office of Inspector General

November 29, 2016

OIG 17-3-001

Table of Contents

Appendixes

Abbreviations

ASP	Award Submission Portal
CIGIE	Council of Inspectors General on Integrity and Efficiency
DATA Act	Digital Accountability and Transparency Act of 2014
DAIMS	DATA Act Information Model Schema
DAWG	DATA Act Working Group
FFATA	Federal Funding Accountability and Transparency Act
FPDS-NG	Federal Procurement Data System – Next Generation
FSRS	FFTA Sub-award Reporting System
GAO	Government Accountability Office
IDD	Interface Definition Document
NSF	National Science Foundation
OIG	Office of Inspector General
OMB	Office of Management and Budget
PMO	Project Management Office
PMBOK	Project Management Body of Knowledge
RSS	Reporting Submission Specifications
SAO	Senior Accountable Official
Treasury	U.S. Department of Treasury

Background

The Digital Accountability and Transparency Act of 2014 (DATA Act) (P.L. 113-101), enacted May 9, 2014, requires federal agencies, including NSF, to report financial and payment data by May 2017 in accordance with data standards, definitions, and guidance established by the U.S. Department of Treasury (Treasury) and the Office of Management and Budget (OMB).

Treasury provided agencies with the DATA Act Implementation Playbook[1] (Treasury Playbook), which describes 8 key Steps for agencies to follow in implementing the DATA Act. Appendix C shows NSF's progress in implementing each of these steps as of August 31, 2016. Additionally, Treasury is developing the DATA Act Production Broker, a program that will assemble agency data for submission to USASpending.gov, a public website available to taxpayers and policy makers. Appendix D provides an overview of the data submission process.

Results of Inspection

The National Science Foundation (NSF) has made progress in implementing the DATA Act, but needs to take additional steps to strengthen its project management practices to ensure compliance with all reporting requirements. NSF developed a contingency plan to submit data regardless of technical delays, implemented a governance structure, and completed and submitted implementation plans to OMB. However, we could not determine whether NSF will meet the DATA Act's May 2017 reporting deadline because of external issues such as changes and delays in implementation guidance. In addition, we found that due to project management challenges, NSF may miss or overlook project tasks and milestones when implementing DATA Act requirements because of weaknesses in NSF's project planning tools, progress metrics, and documentation.

NSF Has Made Progress toward Implementing the DATA Act

NSF has made progress toward implementing DATA Act requirements even though implementation guidance and reporting requirements have been changed and delayed. For example, Treasury delayed releasing the final version of the data reporting standards to April 2016, four months later than planned. Federal enterprise resource planning software vendors delayed developing and finalizing the reporting software until Treasury finalized the data standards, and have not released all software patches yet. After the software release, agencies may need to test and customize it before they can use it to submit data to USASpending.gov. NSF identified the possible late delivery of the software patches as a high-impact project risk. If the patches are not delivered in enough time for testing and implementation, NSF would be at significant risk of missing the May 2017 DATA Act deadline. NSF, therefore, mitigated that risk by

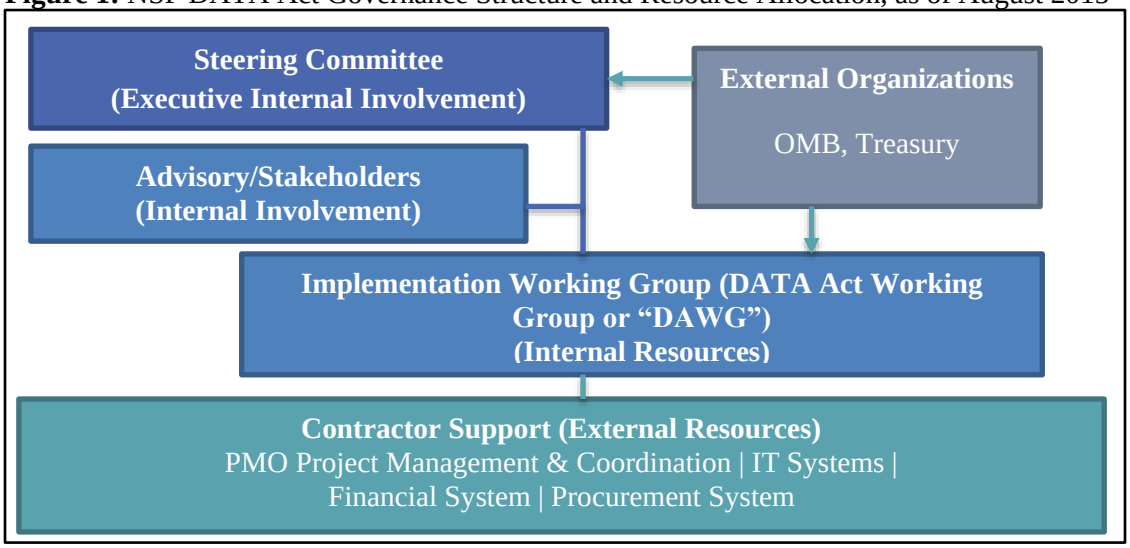
[1] In June 2015, Treasury issued the *DATA Act Implementation Playbook*, Version 1.0. Version 2.0 of the Playbook, released in June 2016, updated the recommended Steps and guidance, consistent with progress made since Version 1.0.

developing a contingency plan (Plan B) to submit data regardless of delays to government-wide vendor patches affecting NSF's financial system (i.e., Oracle patches for iTRAK). As of August 31, 2016, NSF had initiated this contingency plan and was tracking and monitoring its implementation through detailed project planning (e.g. weekly meetings, Plan B dashboard, and a timeline).

NSF has taken other steps toward meeting the May 2017 reporting deadline, and as of August 31, 2016, NSF reported it was on track to implement the DATA Act requirements on time. Specifically, NSF:

- completed and submitted to OMB initial (August 2015) and updated (August 2016) implementation plans with required elements;
- implemented a governance structure (Figure 1), that includes a(n):
    - Executive-level Steering Committee
    - DATA Act Working Group (DAWG)
    - Project Management Office (PMO)
    - Senior Accountable Official (SAO)
- engaged in testing NSF data through a prototype Broker[2] to identify and correct data issues early in the process;
- communicated with OMB and Treasury, and participated in Government-wide groups to share information and leverage existing resources across the government, and;
- reviewed DATA Act data elements during the data standardization process, and participated in the interagency Data Standards Working Group to facilitate the development of a single, standardized set of data elements and definitions across the government.

Figure 1: NSF DATA Act Governance Structure and Resource Allocation, as of August 2015



Source: Governance structure from NSF DAWG SharePoint Site.

[2] The Broker system (1) checks that submitted data follow a standardized format that will allow for aggregation and comparison across the government, and (2) validates selected data elements to ensure the data is accurate. GAO Report, *DATA Act: Initial Observations on Technical Implementation* (GAO-16-824R); issued August 2016.

NSF Should Strengthen Project Management Practices

NSF may miss or overlook project tasks and milestones when implementing DATA Act requirements because of weaknesses in NSF's project planning tools, progress metrics, and documentation. Specifically, as of August 31, 2016, NSF had not developed and implemented a:

- Detailed Project Management Plan
- Risk Management Plan
- Human Resource Plan
- Process for Documenting Key Decisions
- Process to Track Data Inventory Gaps

Project Management Planning

According to NSF's August 2015 Implementation Plan, NSF planned to complete a detailed Project Management Plan for DATA Act implementation by September 30, 2016, but NSF had not started working on this detailed plan as of August 31, 2016. NSF did document high-level project plans that showed NSF's implementation status for each of the Treasury Playbook's 8 Steps, in both its August 2015 and August 2016 DATA Act Implementation Plans. However, these high level plans did not provide sufficient detail to regularly track and monitor the project to ensure NSF meets all the implementation requirements (Appendix E describes best practices for Project Management Planning).

NSF's high-level project plans and other planning documents did not list and track each item NSF needed to address. For example, NSF's question of how to populate the value for the 'Primary Place of Performance Foreign Location Description' data element was not listed in NSF's high-level Project Plan. NSF informed us that this issue would have been an action item that was separate from the Project Plan. In another example, NSF informed us that the development of a formal Risk Management Plan will be included in the agency's forthcoming detailed Project Management Plan, but it was not listed in either of NSF's high-level Project Plans.

As of August 31, 2016, NSF officials told us that its project plan remained at a high-level, and the DAWG was exploring the best way to develop and manage a detailed project plan. Further, there was no central mechanism or document that tied all the different action items, work streams, and pieces of the project together, and tracked them. Consequently, NSF may be at risk for overlooking details, missing deadlines or target dates, and failing to implement the solutions necessary for full DATA Act compliance and reporting by May 2017.

Risk Management Planning

NSF did not implement a formal Risk Management Plan to identify, mitigate, and track risks that could affect NSF's DATA Act implementation (Appendix E describes best practices for Risk Management Planning), although the agency included language about managing risk in its August 2015 and August

2016 DATA Act Implementation Plans. NSF officials told us that other higher priority tasks had taken precedence over developing a Risk Management Plan.

Even though NSF did not formally implement a Risk Management Plan, the NSF DAWG periodically identified, evaluated, and updated several risks that could affect DATA Act implementation. NSF discussed these project risks at various points in internal meetings throughout its DATA Act implementation. NSF documented these project risks in both the implementation plans it submitted to OMB, and in records of status meetings with its Steering Committee, and OMB and Treasury. In its August 12, 2016 implementation plan, NSF listed and rated nine project risks as high, medium, or low, and outlined mitigation steps for each risk.

NSF's contingency plan (Plan B) was a direct outcome from its risk management activities. NSF found that the agency's most significant risk to on-time DATA Act compliance was if the external vendor (Oracle) did not deliver software patches in enough time for testing, configuration, and implementation. NSF, therefore, mitigated that risk by developing a contingency plan (Plan B) to submit data regardless of external delays.

At our request, NSF developed and provided us a risk document, dated August 30, 2016, that provided the mitigation status of each of the nine risks. However, this document did not identify risk owners and NSF did not document a risk status and resolution tracking process. Further, NSF's risk documentation did not define the meaning or significance of each risk rating, and the ratings did not clearly indicate each risk's probability and impact.

NSF officials stated they would complete a formal Risk Management Plan by December 31, 2016.

Human Resource Planning

NSF did not develop a Human Resource Plan to identify critical skills and competencies, and the number of staff needed to implement the DATA Act successfully (Appendix E describes best practices for Human Resource Planning). Because NSF did not receive funding to implement the DATA Act, NSF is leveraging existing resources to fulfill its responsibilities under the Act. The DATA Act implementation is highly technical, iterative in nature, and requires staff with specialized technical skills, such as knowledge of IT systems architecture, and the ability to adapt to evolving technical requirements. Loss of key NSF implementation team members and Subject Matter Experts could leave NSF vulnerable to delays and impact DATA Act compliance. Developing and maintaining a Human Resource Plan that considers staffing and succession planning for DATA Act implementation efforts could mitigate this risk.

NSF reallocated its existing staff to implement the DATA Act. NSF's DAWG members work part-time on the DAWG and have other competing priorities and duties. For example, we identified an individual who was heavily involved in both NSF's DATA Act project management and technical development functions. NSF risks losing project, technical, and management knowledge critical to the agency's successful DATA Act implementation if this individual were to leave, or if NSF experienced other unexpected DATA Act staff turnover.

In another example, NSF recognized that its upcoming relocation to Alexandria, VA could hinder DATA Act implementation. Preparations for the move could strain NSF staffing and if NSF does not plan and prioritize these activities appropriately, they may prevent NSF from implementing the DATA Act by May 2017.

Documenting Key Decisions and Timely Information Sharing

According to GAO, documenting key decisions is a best practice, and developing internal documentation of agency activities is an essential part of accountability for decision-making.[3]

NSF used the DAWG SharePoint site as its main project management tool to upload documents related to DATA Act implementation. However, NSF did not upload several documents until we requested them as part of our review. Specifically, NSF did not post weekly DAWG meeting minutes subsequent to March 10, 2016 until after we asked about them in August 2016. Additionally, records of key communications with OMB and Treasury containing policy decisions were not always uploaded in a timely manner to the DAWG SharePoint site. In addition, NSF does not prepare separate meeting minutes for Steering Committee meetings, OMB and Treasury meetings, Office Hours, SAO meetings, and other meetings related to DATA Act implementation.

As a result, there is a risk NSF is not documenting all key decisions. Without timely and appropriate documentation, NSF risks misplacing information, duplication of effort, and reduced transparency.

Tracking Data Inventory Gaps

The DATA Act requires standardization throughout the government to report financial data to the public. Each agency must modify its financial systems to report the new data fields and formats required by the Act. Treasury and OMB provided agencies with data inventory templates to help agencies map the DATA Act's 57 data elements to their systems, and to identify gaps, such as data elements that would pose a challenge to the successful production and submission of the DATA Act files.

NSF's data inventory documentation did not support and confirm its assertion that NSF had identified and resolved all of the gaps. Gaps can include existing fields in NSF's systems that do not align with DATA Act standards, or NSF systems that cannot produce the required data without modifications to financial reporting software or other workarounds.

NSF's data inventory documentation was not complete or clear. Specifically:

- Not all template fields, such as the field indicating which agency source system(s) the data was housed in, were completed for each DATA Act data element.
- NSF did not have a documented mechanism to centrally manage and track gaps and their resolution status.

[3] GAO Report, *Surface Transportation: Competitive Grant Programs Could Benefit from Increased Performance Focus and Better Documentation of Key Decisions* (GAO-11-234; issued, March 2011).

- Some of the inventory documents did not have a date of completion (applicability), nor indicate who performed the analysis.
- NSF did not post one key data inventory document to the SharePoint site until August 2016, a full year after it was completed in August 2015.
- NSF had multiple versions of data inventory documents, all of which used Treasury and OMB templates to identify various data and systems gaps. However, the data inventory documentation did not indicate the resolution status of each gap, nor how each document interacted, depended upon, and was related to or different from the others.

All of these issues made it difficult for us to discern what actions NSF had taken and when, which data and systems gaps NSF had resolved, and whether NSF systems captured all the required data elements.

Conclusion

With the May 2017 DATA Act reporting deadline just a few months away, NSF must complete its remaining implementation activities, including testing its data and modifying agency systems to ensure they capture all the required data elements to comply with the DATA Act. The lack of additional funding to implement the DATA Act, human resource constraints, and external factors, such as delays and changes in guidance, present challenges to successful implementation. NSF must strengthen its project management practices to identify and mitigate these risks and ensure the agency does not overlook project tasks and milestones when implementing DATA Act requirements.

Recommendations

We recommend NSF strengthen DATA Act project management by:

1. Completing and maintaining a detailed Project Management Plan that ties together all action items, work streams, and elements of the project together, and tracks them;
2. Finalizing and implementing a Risk Management Plan;
3. Developing and maintaining a Human Resource Plan for its DATA Act implementation;
4. Establishing a process to promptly document meeting minutes and key decisions and post them, as well as other key collaborative project management documents, on the DAWG SharePoint site; and
5. Establishing a process to regularly track and document the resolution status of data gaps and other project issues.

Agency Response and OIG Comments

NSF generally agreed with the recommendations in the report, and recognized that there are opportunities to strengthen project management practices to help mitigate risks to DATA Act implementation. NSF stated it has started implementing corrective actions for some of our recommendations, such as completing its Risk Management Plan, which includes the management of a Risk Register.

For our recommendation to develop a specific Human Resource Plan for implementing the DATA Act, NSF stated it did not believe the benefit of developing a Human Resource Plan for a project of this size and scope outweighs the costs. NSF provided an alternative to our recommendation, which is to use existing Human Resource Planning for organizations responsible for DATA Act implementation. The Office of Budget, Finance, and Award Management (BFA) developed a succession plan for key staff in BFA Divisions, which includes some core staff resources assigned to implement the DATA Act. However, the BFA succession plan is not specific to NSF's DATA Act implementation efforts, and does not cover all DATA Act implementation personnel in BFA or any outside of BFA. To minimize the impact of unexpected departures of key staff and ensure transparency in DATA Act staffing and succession planning, NSF should have a Human Resource Plan for all individuals on the DATA Act Working Group and Steering Committee, which could be specific to DATA Act implementation or based on already existing organizational plans.

In response to our recommendation to regularly track and document the resolution status of data gaps and other project issues, NSF believes its actions to date address this issue. NSF cited its completed Plan B and Award Submission Portal (ASP) data mappings, and the difficulty NSF has experienced in finalizing a data inventory due to Treasury releasing multiple iterative versions of the data schema. NSF stated that Oracle will fulfill the required gap analysis and provide the necessary patches for NSF's original implementation approach (Plan A). While we agree NSF has taken steps to complete its data inventory and certain data gaps may be resolved or eliminated with subsequent releases of Treasury's schema guidance, we still believe it would be prudent for NSF to have an audit trail that documents its actions to oversee all data gaps and project issues as they are resolved to ensure compliance with all reporting requirements. NSF OIG urges NSF to take additional actions to document its resolution of data gaps consistent with Treasury's 8 Step Playbook.

We have included NSF's response to this report in its entirety as Appendix A.

OIG Contact and Staff Acknowledgement

Elizabeth Goebels – Performance Audits Lead
(703) 292-8483 or egoebels@nsf.gov

In addition to Ms. Goebels, Emily Franko, Brian Gallagher, Darrell Drake, and Laura Rainey made key contributions to this report.

Appendix A: Agency Response

NATIONAL SCIENCE FOUNDATION
4201 Wilson Boulevard
Arlington, VA 22230

MEMORANDUM

Date: November 18, 2016

To: Mark Bell
Assistant Inspector General
Office of Audits

From: José Muñoz
Chief Technology Officer and Senior Accountable Officer/DATA Act
National Science Foundation

Subject: Response to Official Draft Report, *NSF Should Take Additional Steps to Ensure Compliance with the DATA Act*

Attached please find our response to your subject Official Draft Report dated November 2, 2016. We provided a response to each of the five recommendations offered in the report.

Thank you for providing the opportunity to provide a response and for considering the response as you prepare the final audit report.

We appreciate the courtesies and assistance OIG staff provided during the audit. If you have any questions, please contact myself at (703) 292-7093 or Charisse Carney-Nunes at (703) 292-5056.

Attachment

José L. Muñoz, Ph.D.
Chief Technology Officer and
DATA Act SAO

NSF Response to OIG's DATA Act Readiness Review -- Final

MEMORANDUM

Date: November 18, 2016

To: Mark Bell, Assistant Inspector General for Audit

From: José Muñoz, DATA Act Senior Accountable Official and Chief Technology Officer

Subject: Management's Response to the Official Draft Report on NSF OIG's DATA Act Readiness Review

The National Science Foundation (NSF) appreciates the opportunity to respond to the Office of the Inspector General's (OIG) Official Draft Report on the Digital Accountability and Transparency Act (DATA Act) Readiness Review. We are pleased that the Official Draft found that NSF has made progress toward implementing the DATA Act, and NSF generally agrees with most of the recommendations.

We are pleased to report that NSF's DATA Act implementation has been undertaken with diligence and transparency, and the OIG is an *ex-officio* member of the DATA Act Working Group (DAWG). The OIG attends DAWG meetings and has access to DATA Act documentation, both on the DAWG SharePoint site and whenever requested.

NSF is effectively using agency resources to complete the eight key steps in the Department of Treasury's DATA Act Implementation Playbook, which will allow us to meet all DATA Act requirements, including the April 30, 2017 compliance deadline. Following a review of updated implementation plans from agencies, OMB identified several best practices, all of which the NSF has implemented, including establishing an active implementation team; actively engaging OMB and Treasury; and establishing interim solutions and other risk mitigation strategies. As such, NSF believes the agency is well positioned to submit the required DATA Act data by April 30, 2017.

NSF agrees with the OIG that external circumstances may present risks to DATA Act implementation and additional steps to strengthen its project management practices will help mitigate these risks. NSF applies project management practices to DATA Act implementation consonant with the size and scope of the project. Therefore, NSF generally agrees with most of the OIG's recommendations, while providing alternatives to one recommendation. As addressed in detail below, NSF will continue to strengthen its project management practices, focusing on a "right-sized" approach.

OIG Recommendations and NSF Responses Thereto:

1-1. Completing and maintaining a detailed Project Management Plan that ties together all action items, work streams, and elements of the project together, and tracks them.
NSF Response: NSF generally agrees with this recommendation and will develop a right-sized Project Management Plan based on existing subproject plans and additional

NSF Response to OIG's DATA Act Readiness Review -- Final

information as they become available. However, NSF does not consider the example given by the OIG of the population of the "Primary Place of Performance Foreign Location Description" data element as an appropriate item to include on a detailed Project Management Plan. Such activities are identified and tracked at the workstream level and updates provided at weekly DAWG meetings. Given the resources available, NSF does not believe that the benefits of completing and maintaining an overarching Project Management Plan with that level of detail outweigh the costs.

Prior to the conclusion of the OIG's field work, NSF identified all necessary activities in both implementation plans that have been submitted to OMB in August 2015 and August 2016 and in subproject plans for implementation workstreams. NSF appreciates the benefit of compiling this information in one location. Since the conclusion of the OIG's inspection, NSF has taken strides to improve the DATA Act Project Management Office's (PMO) documentation of progress of activities and next steps for implementation. NSF has also compiled working activities included in project plans into a central document maintained by the PMO in a Microsoft Project format with a pdf version periodically posted on the DAWG SharePoint site. NSF is now more formally documenting progress on current activities, planned activities, and issues in Weekly Status Reports, which are updated by each workstream, reviewed in the weekly DAWG meeting, and maintained on the SharePoint site. NSF will continue to refine its detailed Project Management Plan and ensure it serves the needs of this type of project.

1-2. Finalizing and implementing a Risk Management Plan.

NSF Response: NSF agrees with this recommendation and, since the conclusion of OIG's research, has created and implemented a Risk Management Plan, which includes the management of a Risk Register on the SharePoint site. In line with best practices, the Risk Management Plan includes the identification process, Risk Register description, mitigation steps, and defines probability and impact rating scales. NSF has documented all risks open at this time into the Risk Register and will continue to review risks on a monthly basis at DAWG meetings as well as when new risks arise or status changes occur. NSF believes that its activities to date address this recommendation.

1-3. Developing and maintaining a Human Resource Plan for its DATA Act implementation.

NSF Response: NSF does not believe the benefit of developing a Human Resource Plan for a project of this size and scope outweighs the costs. NSF's alternative, consonant with its practice for similar projects in size and scope and in consideration of benefits vs. costs, is utilizing existing human resource planning of the relevant resource components (BFA, OIRM, etc.). NSF has identified and actively monitors any workload issues resulting from

NSF Response to OIG's DATA Act Readiness Review -- Final

NSF's relocation to Alexandria. NSF agrees that these risks and mitigation actions, identified in the August 2015 Implementation Plan, should continue to be monitored closely.

1-4. **Establishing a process to promptly document meeting minutes and key decisions and post them, as well as other key collaborative project management documents, on the DAWG SharePoint site.**

NSF Response: We agree.

1-5. **Establishing a process to regularly track and document the resolution status of data gaps and other project issues.**

NSF Response: NSF believes that its actions to date address this recommendation. More specifically, Oracle will fulfill the required gap analysis and provide the necessary patches for NSF's original implementation approach (Plan A). NSF has also completed the mapping and gap analysis for Plan B and posted this material to the SharePoint site in August 2016. With respect to financial assistance data, the Award Submission Portal (ASP) mapping is complete and will be posted on SharePoint in November 2016. Mapping and gap analysis for procurement data is not necessary as the Broker will pull procurement data directly from the Federal Procurement Data System – Next Generation (FPDS-NG).

We appreciate that the OIG expresses concern over status and tracking of the DATA Act's 57 data elements, specifically the status of a data inventory template (the Schema) provided by Treasury and OMB. However, as Treasury has continued to release multiple versions of the Schema, each successive release rendered the previous one "not applicable" making it difficult, if not impossible, to finalize NSF's version of the Schema. All other project issues and activities are tracked and documented in Weekly Status Reports shared at DAWG meetings and maintained on SharePoint. NSF will continue to provide information documenting the required activities, including Oracle's analysis for Plan A.

NSF looks forward to working with the OIG to resolve these recommendations. Thank you for the opportunity to respond to the Official Draft Report for the OIG's DATA Act Readiness Review.

Appendix B: Objective, Scope, and Methodology

We performed this inspection to evaluate the processes, systems, and controls that NSF has implemented, or plans to implement, to report financial and payment data in accordance with the requirements of the DATA Act, and to determine whether NSF is positioned to meet the statutory May 2017 reporting deadline. We conducted this readiness review[4] to provide NSF recommendations on how to improve the likelihood of compliance with the requirements of the DATA Act prior to full implementation.

The scope of this inspection was NSF's DATA Act implementation efforts as of August 31, 2016, which includes NSF's progress in completing Steps 1 through 4 and part of Step 5[5] of the recommended 8-Step approach in Treasury's DATA Act Implementation Playbook.

To accomplish our objectives, we:

- obtained an understanding of NSF's governance structure, processes, and controls planned and/or established by reviewing the NSF's DATA Act Working Group documentation on the DAWG SharePoint site;
- attended weekly DAWG meetings in an *ex-officio*[6] capacity to observe the DAWG activities and stay apprised of agency progress; and
- conducted interviews with individuals responsible for implementing the DATA Act, including the Senior Accountable Official and other DAWG members from NSF's Division of Information Systems, Budget Division, Division of Financial Management, Division of Institution and Award Support, Division of Acquisition and Cooperative Support, and contractor Project Management Office support.

Additionally, we reviewed NSF's DATA Act Implementation Plan and Agency Progress Dashboard Status Report submissions to OMB and Treasury. We used this information to assess NSF's efforts and formal implementation plans to report financial and payment information under the DATA Act.

We also reviewed applicable standards including laws, regulations, directives, and OMB and Treasury guidance on the DATA Act, including Treasury's 8-Step Playbook, and evaluated whether NSF complied with these criteria. We followed the Council of the Inspectors General on Integrity and Efficiency (CIGIE) Federal Audit Executive Council's Readiness Review Guide in conducting this inspection.

[4] The Council on Inspectors General on Integrity and Efficiency (CIGIE) identified a timing anomaly with the oversight requirements for the Inspectors General in the DATA Act. The first Inspector General reports assessing the completeness, timeliness, quality, and accuracy of data submitted by the agencies are due in November 2016. However, agencies are not required to submit data in compliance with the DATA Act until May 2017. Therefore, CIGIE informed Congress in December 2015 that the OIGs will provide Congress with the first required reports in November 2017, and encouraged Inspectors General to undertake DATA Act "readiness reviews."
[5] We reviewed NSF's data mapping documentation, which is listed as a deliverable under Step 5 'Execute Broker' in Treasury's 8 Step Playbook.
[6] To maintain our independence, we did not participate in nor provide input into DAWG decision-making.

We conducted this inspection from May through August 2016 in accordance with Quality Standards for Inspection and Evaluation, January 2012, issued by the Council of Inspectors General on Integrity and Efficiency. Per these standards, we should obtain sufficient, appropriate support to provide a reasonable basis for our findings and conclusions.

We held an exit conference with NSF management on October 28, 2016.

Appendix C: NSF's DATA Act Implementation Status As of August 2016

The DATA Act Implementation Playbook (Version 1.0)'s 8 Steps for Agencies to Follow	NSF's Implementation Status[7] as of August 2016
1) Organize Team Create an agency DATA Act work group including impacted communities (e.g., Chief Information Office, Budget, and Accounting) and identify Senior Accountable Officer (SAO)	**Completed**
2) Review Elements Review list of DATA Act elements and participate in data definitions standardization	**Completed**
3) Inventory Data Perform inventory of Agency data and associated business processes	**In-Process** (To be Completed by September 30, 2016)
4) Design & Strategize a) Plan changes (e.g., adding Award IDs to financial systems) to systems and business processes to capture data that are complete multi-level (e.g., summary and award detail) fully-linked data b) Prepare cost estimates for FY 2017 budget projections	**Completed**
5) Execute Broker Implement system changes and extract data (includes mapping of data from agency schema to the DATA Act schema; and the validation) iteratively	**In-Process** (To be Completed by March 31, 2017)
6) Test Broker Implementation Test broker outputs to ensure data are valid iteratively	**In-Process** (To be Completed by March 31, 2017)
7) Update Systems Implement other system changes iteratively (e.g., establish linkages between program and financial data, capture any new data)	**Not Started** (To be Completed by May 9, 2017)
8) Submit Data Update and refine process (repeat 5-7 as needed)	**Not Started** (To be Completed by May 9, 2017)

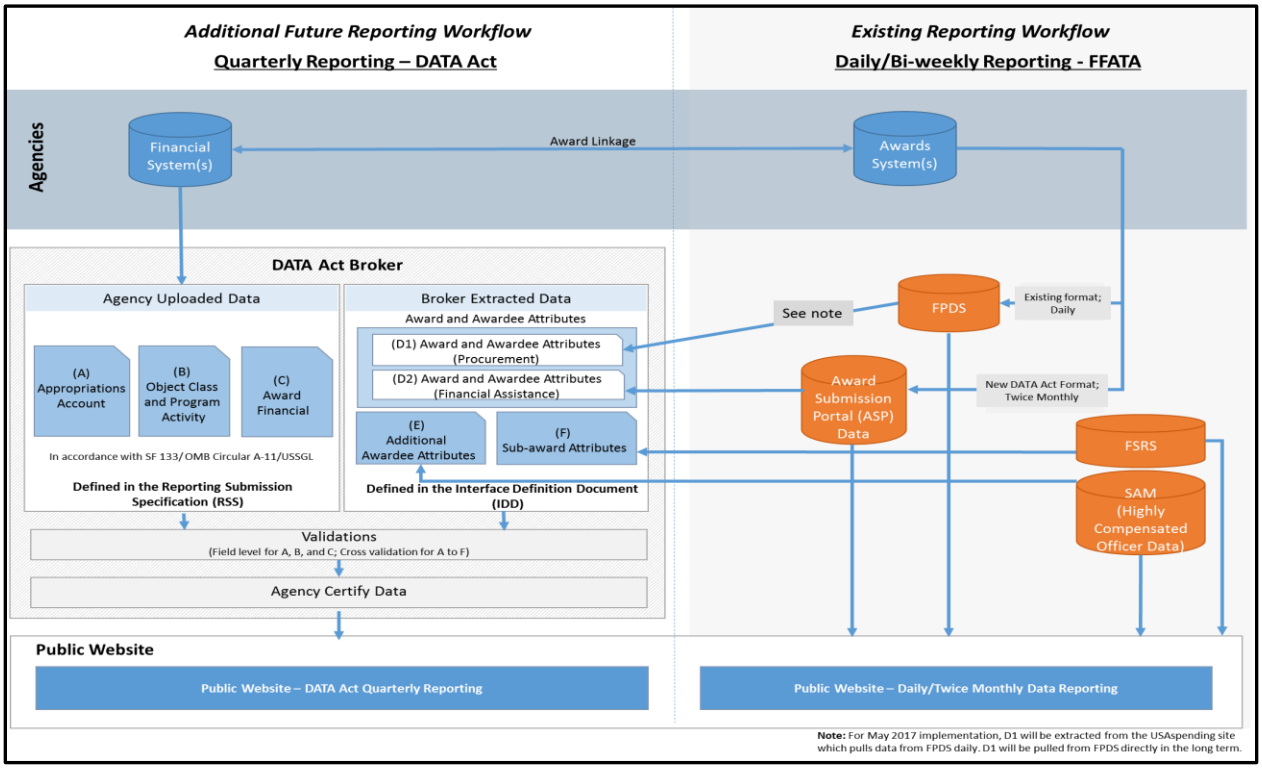
[7] Planned completion dates presented in table are as reported in NSF's August 2016 Agency Progress Dashboard submission to OMB and Treasury. As part of this review, we confirmed these reported statuses were accurate.

Appendix D: DATA Act Schema and Information Flow

Once implemented, agencies are required to submit DATA Act information quarterly. OMB and Treasury issued final data definition standards for reporting on 57 DATA Act data elements on August 31, 2015. Treasury provided additional guidance in the DATA Act Information Model Schema (DAIMS or "DATA Act Schema"), Version 1.0, released on April 29, 2016. These standards and schema will help agencies map the data elements to their current systems, and produce their information in the new DATA Act format.

The Data Flow Diagram (Figure 2) provides an overview of the sources of data included in the DAIMS reporting architecture and submission specifications (the seven files, A through F, described below), and how federal agencies will submit their information to the DATA Act Broker, Treasury's reporting system. This model shows how the data flows from the agency financial and awards systems, as well as external systems, to reach the public USASpending.gov website.

Figure 2: Data Flow Diagram



Source: DATA Act Implementation Playbook, Version 2.0, June 2016 and DAIMS, Version 1.0, April 2016.

Specifically, the Broker will collect agency data, contained in files A through F, in two ways, through agency uploads, and Broker extracts, as described below.

Agency Submitted Content

The DAIMS Reporting Submission Specification (RSS) outlines three types of files that are submitted by an agency to the Broker:

- File A - Appropriation summary level data that are aligned to the SF 133 reporting.
- File B - Obligation and outlay information at the program activity and object class level.
- File C - Obligations at the award and object class level.

Broker Extracted Content from Existing Systems

The DAIMS Interface Definition Document (IDD) details which data will be extracted by the DATA Act Broker from external and existing government-wide feeder systems. There are four file types that are pulled from existing systems:

- File D1 - Award and awardee attributes for procurement data pulled from the Federal Procurement Data System – Next Generation (FPDS-NG).
- File D2 - Award and Awardee Attributes for financial assistance data extracted from the Awards Submission Portal (ASP).
- File E - Additional prime awardee attributes pulled from System for Award Management (SAM).
- File F - Sub-award attributes reported from the Federal Funding Accountability and Transparency Act[8] (FFATA) Sub-award Reporting System (FSRS).

[8] The DATA Act amends the Federal Funding Accountability and Transparency Act (FFATA) of 2006 (P.L. 109-282, as amended), which established requirements for federal agencies to report federal award actions to a central, publicly accessible website (USAspending.gov); and identified required data to be reported. FFATA was amended in 2008 to require agencies to report additional data for federal awards.

Appendix E: Best Practices for Project Management

The Project Management Body of Knowledge[9] (PMBOK) provides guidance and best practices for nine knowledge areas, including Project Risk Management and Project Human Resource Management; and five process groups, including the Monitoring & Controlling Process Group. GAO has also provided guidance for Project Management Planning[10] and Human Resource Management.[11]

Project Management Planning

Project planning is a fundamental tenant of project management. According to GAO (Report GAO-11-50), program management principles and best practices emphasize the importance of using a Project Management Plan. Among other things, a Project Management Plan establishes a complete description that ties together all program activities and evolves over time to continuously reflect the current status and desired endpoint of the project.

According to the PMBOK, a Project Management Plan defines how the project is planned, executed, monitored, controlled, and closed. One of the key benefits of the Project Management Plan is its ability to adapt to potential changes as they occur, and ensure the quality requirements of the project are achieved.

Risk Management

According to the PMBOK, Project Risk Management is an important aspect of project management, and includes conducting Risk Management Planning, identification, analysis, response planning, and monitoring and control on a project. The Risk Management Plan is a subset of the Project Management Plan that:

- describes the roles and responsibilities for each risk;
- describes the timing of Risk Management activities;
- provides an analysis and definitions of the risk probability and impact;
- describes the individual project and the organization's risk thresholds; and
- documents tracking and reporting processes.

Risk Register

A Risk Register contains risk-related information including identified risks, risk owners responsible for each risk, risk responses, specific implementation actions, and the outcomes of the Risk Management

[9] Project Management Institute: *A Guide to the Project Management Body of Knowledge (PMBOK)*, Fourth Edition, 2008, is a recognized standard for project management.
[10] GAO, *Information Technology: Opportunities Exist to Improve Management of DOD's Electric Health Record Initiative* (GAO-11-50; issued, October 2010).
[11] GAO, *Human Capital: Key Principles for Effective Strategic Workforce Planning* (GAO-04-39; issued, December 2003).

processes as they are conducted. The Risk Register is a useful tool to track and control identified risks and potential responses.

Human Resource Planning

According to the Government Accountability Office (Report GAO-04-39) Human Resource Planning should:

- determine the critical skills and competencies needed for project success;
- identify human resources with those necessary skills; and
- include succession plans for leadership and other critical positions.

According to the PMBOK, a Human Resource Plan describes and documents project roles, responsibilities, required skills, and reporting relationships. The Human Resource Plan also includes a Staffing Management Plan that describes how human resource requirements will be met, as well as a timetable for staff acquisition and release. The Staffing Management Plan is updated continually during the project to direct ongoing team member acquisition and development actions, including identifying when acquisition activities, such as recruiting, should start. Further, according to the PMBOK, in developing a Human Resource Plan, important consideration should be given to the availability of, or competition for, scarce or limited human resources.

Project Monitoring

According to the PMBOK, the key benefit of project monitoring and controlling is that project performance is observed and measured regularly and consistently to identify variances from the Project Management Plan. Further, continuous monitoring provides the project team insight into the health of the project and identifies any areas requiring additional attention. Status reporting should engage the project stakeholders throughout the life of the project, and be directly related to the project plan. Accurate and current project status reports should be maintained to provide project managers with timely and meaningful information needed to identify risks, make appropriate decisions, and increase the likelihood of project success.