October 2022

INFORMATION TECHNOLOGY

Education Needs to Address Student Aid Modernization Weaknesses

Accessible Version

GAO Highlights

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Education Needs to Address Student Aid Modernization Weaknesses

Why GAO Did This Study

In fiscal year 2021, the Department of Education's FSA spent about $1.3 billion to process federal student aid totaling about $112 billion. To modernize processing of student aid, Education initiated an effort, referred to as the Next Gen program. One of the most critical and expensive projects within Next Gen is a system development effort focused on strengthening partnerships with participating schools.

The House report accompanying the Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Bill, 2021 included a provision for GAO to examine FSA's efforts to transition to the Next Gen program. This report examines (1) the status of FSA's Next Gen program; (2) the extent to which FSA cost estimation guidance and the Next Gen program's cost and schedule estimates aligned with GAO best practices; and (3) the extent to which FSA implemented best IT practices on scope, system development quality, and stakeholder management for the school partnership project.

GAO reviewed Next Gen program and project planning documentation, and evaluated the Next Gen program's cost and schedule estimates against GAO best practices. GAO also assessed the school partnership project against selected project management best practices.

What GAO Recommends

GAO is making 14 recommendations to Education, including addressing weaknesses in cost, scheduling, and project management practices. FSA, on behalf of Education, generally concurred with the recommendations.

View GAO-23-105333. For more information, contact Marisol Cruz Cain at (202) 512-5017 or cruzcainm@gao.gov.

What GAO Found

Education's Office of Federal Student Aid (FSA) initiated the Next Gen program in 2017. Next Gen's purpose was to modernize the systems and processes that students, parents, borrowers, and school partners use to apply for, administer, and/or process federal student aid. As of August 2022, FSA had modified the initial scope of Next Gen from 13 projects to nine projects. Of the nine projects, five are considered complete—a data strategy plan, a systems architecture document, a pilot effort on payments, deployment of a data management platform, and deployment of a loan data system. The four remaining projects had each experienced schedule delays with interim milestones. Further, FSA does not know when three of the four projects would be fully implemented (see table).

Schedule Status for Ongoing Federal Student Aid (FSA) Next Gen Projects, as of June 2022

Project name	Original planned full implementation date	Current planned full implementation date as of June 2022
Business Process Operations	7/26/2022	3/31/2024
Digital and Customer Care	8/12/2021	Not yet determined
Partner Participation and Oversight	3/1/2022	Not yet determined
Unified Servicing and Data Solution (previously called Enhanced Processing Solution and Interim Servicing Solution)	9/22/2022[a]	Not yet determined

Source: GAO analysis of Next Gen FSA program documentation and data provided by FSA officials. | GAO-23-105333

[a]This date represents when FSA planned to implement the Interim Servicing Solution environment.

FSA reported that it has spent a total of $502 million on the Next Gen program, as of June 2022. However, this amount does not include all program costs because FSA has not tracked government-related labor costs. Even with this omission, the amount reported has already exceeded FSA's September 2021 life cycle cost estimate of $415 million.

FSA's schedule and cost shortcomings reflect its lack of alignment with GAO best practices. Specifically, FSA's cost estimation guidance does not fully address these practices. Further, the Next Gen program did not substantially or fully meet best practices for any of the key characteristics of a reliable cost or schedule estimate. Until these weaknesses are addressed, FSA cost and schedule estimates will continue to be unreliable. In turn, this will impair the ability of senior leadership to make informed decisions on the program's future.

Next Gen's school partnership project is intended to, among other things, deliver to schools a central point of access to FSA. In carrying out the project, FSA partially implemented each of the 11 selected best practices on project scope, system development quality, and stakeholder management. For example, although the project relied on performance reports to monitor system development quality, project officials did not verify that contractor deliverables met criteria specified in the contract prior to their acceptance. Until the project fully implements all selected best practices, its efforts are at risk of additional delays, cost increases, and system capabilities that do not meet schools' needs.

United States Government Accountability Office

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Abbreviations

CPS	Central Processing System
FAFSA®	Free Application for Federal Student Aid
FSA	Federal Student Aid

| PPO | Partner Participation and Oversight |
| PMBOK® | Project Management Body of Knowledge |

U.S. GOVERNMENT ACCOUNTABILITY OFFICE

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October 20, 2022

The Honorable Patty Murray
Chair
The Honorable Roy Blunt
Ranking Member
Subcommittee on Labor, Health and Human Services, Education,
    and Related Agencies
Committee on Appropriations
United States Senate

The Honorable Rosa L. DeLauro
Chair
The Honorable Tom Cole
Ranking Member
Subcommittee on Labor, Health and Human Services, Education,
    and Related Agencies
Committee on Appropriations
House of Representatives

The Department of Education's (Education) Office of Federal Student Aid (FSA) is the largest provider of student financial aid in the nation. In fiscal year 2021, the office processed more than 17.6 million Free Application for Federal Student Aid (FAFSA®) forms and delivered approximately $112.0 billion in aid to more than 10.1 million postsecondary students and their families.

In 2021, FSA spent about $1.3 billion to administer and process federal student aid. FSA does this in a complicated operating environment that requires its students, parents, borrowers, and school partners to access multiple websites and numerous contact telephone numbers. In addition, the current environment includes nine different loan service providers.

To mitigate these challenges, in 2017, Education initiated an effort to modernize FSA's systems and processes used during the federal student aid lifecycle, referred to as the Next Gen program. In 2019, we reported that one of the legacy systems the program was intended to replace was among the 10 most critical federal systems in need of modernization.[1]

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[1]GAO, *Information Technology: Agencies Need to Develop Modernization Plans for Critical Legacy Systems,* GAO-19-471 (Washington, D.C.: June 11, 2019).

Following our 2019 report, the House report accompanying the *Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Bill*, 2021 included a provision for us to examine FSA's efforts to transition to the Next Gen program.[2] One of the most critical and expensive projects within the Next Gen program is the Partner Participation and Oversight (PPO) project. This project is intended to develop and deploy a system that provides school partners with a central point of access to interact with FSA.

This report examines (1) the status of FSA's Next Gen program; (2) the extent to which FSA cost estimation guidance and the FSA Next Gen program's cost and schedule estimates aligned with GAO's cost and schedule best practices; and (3) the extent to which the Next Gen program was implementing best IT practices related to scope, quality, and stakeholder management for the PPO project.

To address the first objective, we reviewed the Next Gen program- and project-level planning documentation, such as program- and project-level management plans and project-level charters, to describe the cost, schedule, and scope changes that Next Gen has experienced since it was initiated. Regarding the actual cost data, we determined that the data provided by the FSA and Next Gen program officials were not complete and reliable. Specifically, the data were incomplete because they did not include information related to all government-related costs. We discuss the limitations of these data in the report. We also reviewed relevant documentation to describe FSA's original and current plans for retiring related legacy systems following the implementation of the Next Gen program's IT systems and applications.

To address the first part of our second objective—to evaluate whether FSA's cost estimation guidance aligns with GAO's cost best practices—we assessed the office's cost estimation policies and procedures. In particular, we assessed FSA's policies and procedures to determine the extent to which the lifecycle cost estimate guidance[3] met the 12 steps in

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[2]H. Rpt. No. 116–450 at 265-266 (Jul. 15, 2020) accompanying the *Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Bill*, 2021.

[3]The guidance documents we reviewed included FSA's lifecycle management methodology, management stage gate review standard operating procedures, annual planning budget estimation guidance, budget initiative request guidance, and independent government cost estimate guide, among other things.

the cost estimating development process, as established by GAO's *Cost Estimating and Assessment Guide*.[4] We conducted this in-depth analysis on FSA's cost estimation guidance because it was important to understand if the guidance that programs were expected to use was sufficient.

To address the second part of our second objective—to evaluate whether the Next Gen program's cost and schedule estimates aligned with GAO's cost and schedule best practices—we assessed the Next Gen program's cost and schedule estimates and related documents describing Next Gen's cost and schedule estimation practices. In particular, we assessed the cost documentation against the characteristics of a comprehensive, accurate, well-documented, and credible cost estimate as outlined in GAO's *Cost Estimating and Assessment Guide*. We also assessed the schedule documentation against the best practices associated with a comprehensive, well-constructed, credible, and controlled schedule as outlined in GAO's *Schedule Assessment Guide*.[5] We noted in our report the instances where cost and schedule data were unreliable.

For our assessments related to FSA's cost estimation guidance and the Next Gen program's cost and schedule estimates, we applied the standard rating scale used in GAO cost and schedule evaluations, assessing each best practice as:

- met—FSA provided complete evidence that satisfies all the criteria;

- substantially met—FSA provided evidence that satisfies more than half of the criteria, but not all the criteria;

- partially met—FSA provided evidence that satisfies about half of the criteria;

- minimally met—FSA provided evidence that satisfies less than half of the criteria; and

- not met—FSA did not provide evidence that satisfies any of the criteria.

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[4]GAO, *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Program Costs*, GAO-20-195G (Washington, D.C.: Mar. 12, 2020).

[5]GAO, *GAO Schedule Assessment Guide: Best Practices for Project Schedules*, GAO-16-89G (Washington, D.C.: Dec. 22, 2015).

To address the third objective, we conducted a detailed review on the Next Gen program's PPO project, which is one of the most critical and expensive projects within the program.[6] Specifically, we assessed the PPO project against best practices outlined in the Project Management Institute's *A Guide to the Project Management Body of Knowledge* (PMBOK® Guide).[7] To select the detailed PMBOK® Guide best practices, we first analyzed the guide's 10 knowledge areas[8] and excluded the cost and schedule knowledge areas because it identified processes that would be addressed by the second objective (i.e., our cost and schedule assessments).

We then selected the knowledge areas that we determined were especially important to the success of the PPO project. As such, we selected the three following knowledge areas: (1) project scope management, (2) system development quality management, and (3) project stakeholder management. Collectively, these three knowledge areas include a total of 13 PMBOK® processes (i.e., best practices). From these 13 processes, we excluded two processes within the project scope management practice because they are addressed in our other objectives.

We then compared the PPO project's artifacts for management of scope, system development quality, and stakeholders to the 11 selected practices. We also interviewed project officials, including the PPO project manager, to (1) obtain an understanding of the processes in place to

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[6]Based on the Next Gen program- and project-level data provided by FSA, we focused this objective on PPO because it had one of the highest planned total lifecycle costs through fiscal 2023.

[7]Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge*, 6th ed. (2017). PMBOK is a trademark of Project Management Institute, Inc. The Project Management Institute, Inc., founded in 1969, is a not-for-profit association that provides global standards for project management. These standards are utilized worldwide and provide guidance on how to manage various aspects of projects, programs, and portfolios. The PMBOK® Guide is the Project Management Institute's flagship publication that includes standards for effective project management.

[8]A knowledge area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques. The 10 knowledge areas within the PMBOK® Guide are: (1) Project Integration Management, (2) Project Scope Management, (3) Project Schedule Management, (4) Project Cost Management, (5) Project Quality Management, (6) Project Resource Management, (7) Project Communications Management, (8) Project Risk Management, (9) Project Procurement Management, and (10) Project Stakeholder Management.

manage the project and (2) discuss the project's efforts to implement the selected practices.

We assessed the PPO project's implementation of the 11 project management best practices as:

- fully implemented, if available evidence demonstrated all aspects of the practice;
- partially implemented, if available evidence demonstrated some, but not all, aspects of the practice; and
- not implemented, if available evidence did not demonstrate any aspect of the practice.

We determined that the data used to support the findings in this report were sufficiently reliable for the purposes of our reporting objectives, with the exception of the office-reported Next Gen program cost and schedule information, as previously discussed. We have also made appropriate attribution indicating the sources of the data. A detailed discussion on our objectives, scope, and methodology are provided in appendix I.

We conducted this performance audit from July 2021 to October 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

FSA is tasked with ensuring that eligible and participating students enrolled in postsecondary educational schools benefit from federal financial assistance for education and training.[9] Specifically, the office is responsible for managing the student financial assistance programs

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[9]The term "financial assistance" includes loans, grants, and work-study funds to students attending college or career school.

authorized under Title IV of the *Higher Education Act* of 1965, as amended.[10]

FSA programs provide grant, work-study, and loan funds to students attending college or career school. In fulfilling its program obligations, the office is the largest provider of student financial aid in the nation. In fiscal year 2021, FSA processed more than 17.6 million FAFSA® forms and delivered approximately $112.0 billion in aid to more than 10.1 million postsecondary students and their families.[11] These students attended approximately 5,600 school partners.[12]

In order to administer its various financial assistance programs, FSA is responsible for a range of functions across the student aid lifecycle. These include:

- educating students and families about the process of obtaining financial aid;

- processing millions of student financial aid applications;

- disbursing billions of dollars in student financial aid;

- enforcing financial aid rules and regulations;

- servicing millions of student loans and helping borrowers avoid default;

- securing repayment from borrowers;

- partnering with schools, private lenders, and other entities to prevent program fraud, waste, and abuse; and

- insuring billions of dollars in guaranteed student loans previously issued by private lenders.

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[10]Title IV of the *Higher Education Act* (20 U.S.C. §§ 1070-1099d) authorizes programs that provide financial assistance to students attending a variety of postsecondary schools.

[11]To apply for federal student aid funds, a student must complete the FAFSA® form. FSA then uses this information to calculate a student's expected family contribution, which is a measure of a student's financial resources and is used to determine how much financial aid a student may receive. A student's expected family contribution varies based on factors such as family size and whether the student has children or other dependents.

[12]School partners are institutions of higher education and postsecondary vocational institutions that are eligible to participate in FSA financial aid programs, provided that the institution offers the appropriate type of program.

Overview of the Federal Student Aid Process

Throughout the federal student aid lifecycle process, various federal and nonfederal entities participate in the program. These entities include the students, schools, and lenders working with or on behalf of FSA. They also include:

- loan service providers—entities that collect payments on loans, respond to customer service inquiries, and perform other administrative tasks associated with maintaining a loan;

- guaranty agencies—state or private nonprofit entities that have agreements with Education under which they will administer student aid loans under the *Higher Education Act*;[13] and

- private collection agencies—entities that recover unpaid debt from borrowers who have defaulted on their loans.

When obtaining information from students, their families, and others, FSA and schools are to follow a four phase process that involves multiple participants and activities: (1) school eligibility determination, (2) student application and eligibility determination, (3) disbursement of funds, and (4) repayment and collection of loans.

Each phase of the process is supported by automated FSA information systems that collect and process student aid information. The information is then used by the office and schools to among other things, determine aid eligibility, type, and amount of aid a student is eligible to receive.

Figure 1 provides a simplified overview of FSA's financial assistance process.

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[13]Pub. L. No. 89-329, 79 Stat. 1232-1254, codified at 20 U.S.C. §§ 1070-1099d.

Figure 1: Simplified Overview of the Office of Federal Student Aid's (FSA) Financial Assistance Process

School Eligibility Determination
Schools, using various automated systems, apply to participate in federal financial assistance programs and FSA determines eligibility.

Student Application and Eligibility Determination
Students apply for federal financial aid using the Free Application for FSA form (paper or electronic).

School

Using various automated systems, FSA processes the application to determine if a student is eligible to receive financial assistance and, if so, the type.

During collection, private collection agencies work with students to collect on delinquent or defaulted loans.

Repayment and Collection of Loans
Loan servicers manage repayment plans, student loan accounts, and determine borrower's eligibility for options that allow eligible borrowers to temporarily postpone loan payments.

Disbursement of Funds
FSA uses automated systems to initiate and track disbursements of funds to eligible students and schools.

Source: GAO analysis of Department of Education, Office of Federal Student Aid data; images: ylivdesign/stock.adobe.com, lembergvector/stock.adobe.com. | GAO-23-105333

Text of Figure 1: Simplified Overview of the Office of Federal Student Aid's (FSA) Financial Assistance Process

1. School Eligibility Determination
   Schools, using various automated systems, apply to participate in federal financial assistance programs and FSA determines eligibility.

2. Student Application and Eligibility Determination
   Students apply for federal financial aid using the Free Application for FSA form (paper or electronic).
   Using various automated systems, FSA processes the application to determine if a student is eligible to receive financial assistance and, if so, the type.

3. Disbursement of Funds
   FSA uses automated systems to initiate and track disbursements of funds to eligible students and schools.

4. Repayment and Collection of Loans
   Loan servicers manage repayment plans, student loan accounts, and determine borrower's eligibility for options that allow eligible borrowers to temporarily postpone loan payments.
   During collection, private collection agencies work with students to collect on delinquent or defaulted loans.

Source: GAO analysis of Department of Education, Office of Federal Student Aid data; images: ylivdesign/stock.adobe.com, lembergvector/stock.adobe.com. | GAO-23-105333

FSA Initiated the Next Gen Program to Address Shortcomings with Its Legacy Operating Environment

In 2021, FSA spent about $1.3 billion to maintain a complicated operating environment to deliver its financial assistance programs. Specifically, the office's current financial aid environment requires its customers (i.e., students, parents, borrowers, and school partners) to access multiple websites and a myriad of contact telephone numbers. In addition, the current environment includes nine different loan service providers in order to receive services.

FSA identified numerous challenges in its operations that adversely affected customers' experiences, including:

- difficulty gathering the information necessary to select the appropriate repayment options,

- challenges navigating the repayment application,

- difficulty with the payment process,

- challenges receiving assistance with loan delinquency and default,

- difficulties correcting issues with accounts,

- challenges accessing accounts,

- unclear communications from FSA and loan servicer providers, and

- receiving inaccurate or inconsistent information from loan service providers.

To address FSA's challenges and its need to modernize legacy systems, in December 2017, the office announced the Next Gen program. The goal of this program was to develop and implement modernized technology,

processes, and operations to improve student, parent, borrower, and school partner experiences and outcomes, across the entire student aid lifecycle. FSA's Chief Operating Officer serves as the decision maker for Next Gen and reports directly to the Secretary of Education. FSA's Next Gen program office is responsible for managing and overseeing the implementation of the program. In 2018, the Next Gen program originally consisted of 10 projects.[14] According to FSA officials, at that time, the office had not established lifecycle cost and schedule estimates for the Next Gen program. In addition, FSA had not established cost estimates for the individual projects, determined when it would fully implement each of these projects, or determined when it would retire any related legacy systems.

As of October 2020, the Next Gen program renamed or replaced most of the original projects, as well as added three additional projects (see table 1). FSA officials estimated that it would implement all 13 projects by September 30, 2026. FSA reported that, as of September 2021, the estimated cost for Next Gen was approximately $415 million. The office also determined that the implementation of Next Gen's IT systems and applications would result in the retirement of five legacy systems.

The projects vary in their scope and complexity. For example, some projects are intended to develop a document, whereas others are intended to develop multiple systems. Table 1 identifies the 13 projects that were in the FSA Next Gen program's scope, as well as the five legacy systems to be retired, as of October 2020.

Table 1: Summary of the Federal Student Aid (FSA) Next Gen Program's Projects and Related Legacy Systems to Be Retired, as of October 2020

Project name	Project description	Existing FSA system to be retired
Application Eligibility and Determination	To provide a modernized system to determine eligibility of student aid through the completion of the Federal Application for Federal Student Aid form.	Central Processing System

[14]At that time, the Next Gen program was comprised of the following projects: (1) digital platform and related middleware, (2) contact center platform and customer relationship management, (3) processing platform for new accounts, (4) processing platform for legacy accounts, (5) business process operations for new accounts, (6) business process operations for legacy accounts, (7) data management platform, (8) identity and access management, (9) cybersecurity, and (10) quality assurance.

Project name	Project description	Existing FSA system to be retired
Business Process Operations	To develop and implement a consolidated call center that provides customer support via multiple channels (i.e., phone, email, chat, text) across the entire student financial aid lifecycle. It is also intended to provide automated back-office processing tasks that cannot be automated within other existing solutions (such as military service members' requests for payment deferment).	None
Cybersecurity	To develop an FSA enterprise-wide (not just Next Gen) security architecture and a security operations center.	None
Digital and Customer Care	To develop and deploy three modernized systems that provide customers (e.g., students, parents, and borrowers) with improved access to student aid tools and resources. The first system is to develop a modernized system and mobile application to provide customers with a single access point to student aid tools and resources and assist students with completing the Federal Application for Federal Student Aid form. The project is also expected to develop and deploy a customer management system to consolidate information from across FSA's systems to efficiently provide information those serving customers. In addition, it plans to develop and deploy a marketing and communications system, to enable FSA to communicate directly with customers through targeted communications.	None
Enterprise Data Management and Analytics Platform Services	To develop and implement an enterprise-wide data management platform that brings together some of FSA's largest existing data platforms. Among other things, this new platform is expected to allow FSA to collect more data, conduct advanced analytics to provide additional insights into FSA programs, and improve oversight of vendors.	None
Enterprise Data Strategy	Was to establish an enterprise data strategy that outlined how FSA will improve data standardization and compliance for six data management areas (architecture, compliance, management, quality, reporting, and security).	None
Identity and Access Management	To provide new enterprise-wide identity and access management capabilities by enhancing its existing solution for identity management known as FSA ID.[a]	None
Interim Servicing Solution (now called Unified Servicing and Data Solution)[b]	To serve as the loan servicing environment for more than 35 million borrowers. This solution is aiming to provide the full suite of current capabilities associated with student aid servicing in the FSA environment.	None
myFSApay[c]	Was to develop a payment pilot that provided student aid recipients at participating schools with an account that combined a prepaid card account with electronic banking functionality and a mobile application experience.	None
National Student Loan Data System[c]	Was to develop a modernized loan data system that stores, maintains, and provides reporting capabilities for student, borrower, and partner data. It also supports the Enterprise Data Management and Analytics Platform Services project.	Legacy National Student Loan Data System
Optimal Processing Solution	To develop and implement a system to modernized technical capabilities to support the full student aid loan lifecycle, including creating and disbursing loans, and loan administration and repayment.	Common Origination and Disbursement system[d]
Partner Participation and Oversight[c]	To develop and deploy a modernized system that provides school partners with a central point of access to FSA's tools and resources to enable management of the Title IV student aid programs. The system is also intended to maintain information needed to manage the Title IV student aid programs, such as student eligibility and demographics, and default rate data about schools, lenders, and guarantors participating in the Title IV programs. In addition, it is expected to re-engineer core student aid delivery and oversight processes.	Postsecondary Education Participants System[e] Participation Management system[f]

Project name	Project description	Existing FSA system to be retired
Technical Architecture	Was to work with experts across the enterprise and industry experts to document the target state architecture for the Next Gen program. This document was expected to identify the technical components (services, tools, and integrations) required to carry out its business processes.	None

Source: GAO analysis of 2020 Next Gen FSA program documentation, including the Next Gen Strategic Plan that FSA provided to Congress on October 28, 2020. | GAO-23-105333

[a]Identity and access management includes implementing controls that are intended to limit or detect inappropriate access to computer resources to protect them from unauthorized modification, loss, and disclosure. Such controls include requiring users to validate their identity and limiting the files and other resources that those validated users can access and the actions they can execute. FSA ID is a username and password combination the customer uses to log in to Department of Education online systems.

[b]The Interim Servicing Solution project replaced the Enhanced Processing Solution project. Interim Servicing Solution was FSA's second attempt to provide capabilities that are intended to support FSA's interim loan servicing environment. In July 2020, FSA canceled the Enhanced Processing Solution project's solicitation due to its failure to reach an agreement with the vendor after 12 weeks of negotiating.

[c]These were new projects that were added to the scope from the FSA Next Gen 2018 planned scope.

[d]The Common Origination and Disbursement system initiates and tracks the disbursement of funds to eligible students and schools for financial aid programs.

[e]The Postsecondary Education Participants System maintains information such as student eligibility, and demographic data and default rate data about schools, lenders, and guarantors participating in the Title IV programs.

[f]The Participation Management system supports the data collection, integration, and sharing of customer data to other FSA systems.

GAO Has Reported on FSA's Need to Replace a Critical Legacy System

We have reported on FSA's need to modernize a critical legacy system. In 2019, we reported that one of the legacy systems that FSA heavily relies on to support the processing of federal student aid applications, called the Central Processing System (CPS), was in need of modernization.[15] Accordingly, we recommended that the Education Chief Information Officer document the department's modernization plans for CPS, to include milestones, a description of the work necessary to modernize the system, and details on the disposition of the legacy system. Education officials concurred with this recommendation.[16] However, as of September 2022, FSA officials were still in the process of updating their CPS modernization plan to include milestones, a

[15]GAO-19-471.

[16]GAO, *Information Technology: Agencies Need to Develop Modernization Plans for Critical Legacy Systems*, GAO-19-351SU (Washington, D.C.: June 11, 2019).

description of the work necessary to modernize the system, and details on the disposition of the legacy system.

The Next Gen Program Has Experienced Reduced Scope, Delayed Schedule, and Understated Costs

As of August 2022, FSA had modified the scope of Next Gen from 13 to nine projects, and had mixed progress in implementing the remaining nine projects. In addition, FSA officials did not know when they would fully implement three of the remaining four projects. The program also had experienced several interim schedule delays with all four of the ongoing projects. Moreover, these schedule delays have affected FSA's ability to retire two legacy systems. In addition, FSA had not fully accounted for all costs associated with Next Gen because it had not included government-related labor costs.

FSA Modified Next Gen's Scope Resulting in the Delayed Retirement of Two Legacy Systems

Although FSA's Next Gen strategic plan from October 2020 included 13 projects, by February 2021, the office reduced the scope of Next Gen down to nine projects. Specifically, FSA canceled two projects, stopped tracking another project as a standalone Next Gen project, and transferred one project to another FSA program.

- In 2020, FSA canceled the Identity and Access Management project, which was to provide new enterprise-wide identity and access management capabilities, because the office decided that it would continue to use the existing identity and access management system.

- FSA canceled the Optimal Processing Solution project, which was to develop a system to modernize the student aid loan administration process, following the enactment of the 2019 *Fostering Undergraduate Talent by Unlocking Resources for Education Act*

(FUTURE Act).[17] Next Gen program officials stated that this act along with the *FAFSA Simplification Act* requires FSA to update its existing processes and systems to incorporate changes in how the office will process student aid eligibility determination, disbursement, and verification. Due to these required changes, the officials said the prior project requirements needed to be revisited.[18]

- Next Gen officials reported that they stopped tracking the Cybersecurity project as a standalone project specific to the program. Instead, FSA officials reported that they decided to continue to manage cybersecurity through the Technology Directorate, as they had historically done in the past.

- On February 12, 2021, FSA transferred the Application Eligibility and Determination project, which was to develop a modernized system to process the FAFSA form—from Next Gen to a new program called the Student Aid and Borrower Eligibility Reform initiative.[19] The project was renamed to the FAFSA® Processing System project. Next Gen program officials stated that their decision to transfer the project was in response to the passage of the *FUTURE* and *FAFSA Simplification Act*s.[20] According to FSA officials, these acts significantly overhauled how the office determines eligibility and the processes used to calculate student aid. As a result, the officials determined that the FAFSA® Processing System project would be better placed with the Student Aid and Borrower Eligibility Reform initiative. The officials stated that the goal of this change was to focus all FSA eligibility efforts under a single program instead of across multiple programs.

  Consequently, transferring the FAFSA® Processing project to a different program resulted in delays in the planned implementation

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[17]See Pub. L. No. 116-91, 133 Stat. 1189-1192, 1196 (2019).This act permanently authorizes funding for minority-serving institutions of higher education and increases the authorization of appropriations for Pell Grants. The act also authorizes the Internal Revenue Service, to disclose certain tax and income information to Education for the administration of federal student aid programs, including determining eligibility for Income-Driven Repayment plans, discharges of loans based on total and permanent disability, and the amount of student financial aid under Title IV of the *Higher Education Act* of 1965.

[18]We have not independently verified how these statutory mandates have forced Next Gen officials to alter their existing processes and systems.

[19]FSA initiated the Student Aid and Borrower Eligibility Reform initiative to address the legislative changes within FUTURE Act and the FAFSA® Simplification Act and enable critical changes to the student aid and borrower eligibility determination processes.

[20]See FUTURE Act, Pub. L. No. 116-91, 133 Stat. 1189 (2019); FAFSA Simplification Act, Pub. L. No. 116-260, Title VII, 134 Stat. 3137 (2020).

and deployment of the project. Specifically, while the project was originally intended to be delivered by October 1, 2022, as of May 2022, FSA officials stated that they anticipated implementing the new replacement system a year later—by October 2023.

The changes in these projects have impacted FSA's plans to retire two related legacy systems. Specifically, while the Optimal Processing Solution project was intended to replace FSA's legacy Common Origination and Disbursement system, the cancelation of the modernized system will result in FSA maintaining the legacy system longer than planned. In June 2022, officials stated that the office was in the process of developing a team to determine if FSA should continue to support the legacy system or start working on a new strategy for modernizing the system.

The delay in implementing the FAFSA® Processing System will also result in FSA maintaining the legacy system—CPS—longer than originally planned, which introduces more risk and cost to the office. Specifically, FSA officials estimated that it will cost the office at least $26.5 million to maintain CPS until the legacy system is retired.

As discussed earlier, in 2019, we recommended that the Education Chief Information Officer document the department's modernization plans for CPS.[21] However, as of September 2022, FSA officials were still in the process of updating their CPS modernization plan to include milestones, a description of the work necessary to modernize the system, and details on the disposition of the legacy system. Finalizing the plan in a timely manner will be a critical step towards modernizing CPS and reducing the risks associated with continuing to rely on this outdated system.

FSA Has Had Mixed Progress in Implementing Next Gen's Projects

As of August 2022, FSA had completed five of the nine remaining Next Gen projects: a data strategy plan, a systems architecture document, a pilot effort on payments, deployment of a data management platform, and deployment of a loan data system. The office deployed various capabilities to its users for three of the four ongoing projects and had many more key milestones remaining. The final project (now called the Unified Servicing and Data Solution) had made little progress because

[21]GAO-19-351SU.

FSA had recently initiated its third attempt (after two prior failed attempts) to modernize the loan servicing environment. Table 2 summarizes the implementation status for the nine projects, as of August 2022.

Table 2: Implementation Status for the Federal Student Aid (FSA) Next Gen Program's Projects, as of August 2022

Project/purpose	Key completed milestones	Key outstanding milestones
Business Process Operations—to develop a consolidated call center that provides customer support via multiple channels (i.e., phone, email, chat, text) across the entire student financial aid lifecycle.	• June 2020: awarded contract to call center vendors. • Between November 2021 and March 2022: deployed the infrastructure and capabilities that enabled the new Business Process Operations vendors to begin assisting customers and school partners, such as answering customer questions related to understating the Federal Application for Federal Student Aid process and general default and forgiveness inquiries.	• January 2023: implement capabilities related to the vendors handling incoming calls from default borrowers. • June 2023: implement capabilities related to the vendors handling requests for loan rehabilitation or reinstatements, among other things. • March 2024: develop and implement all remaining capabilities associated with this project, including the functionality needed to support Next Gen loan servicing responsibilities.
Digital and Customer Care—to develop three modernized systems that provide customers (e.g., students, parents, and borrowers) with improved access to student aid tools and resources.	• Between December 2019 and August 2020: deployed a system that delivered a modernized website (www.Studentaid.gov), and the MyStudentAid mobile application which provide information to students, parents and borrowers about the student aid process. • Since November 2020: deployed additional features on a quarterly basis, including continued enhancements to www.Studentaid.gov and the mobile application.	• Through at least February 2024: continue to deploy features on a quarterly basis, including functionality needed to integrate Digital and Customer Care systems with other Next Gen systems.
Enterprise Data Management and Analytics Platform Services—to develop a repository for all FSA data and enable advanced analytics to provide additional insights and improve vendor oversight.	• Between December 2021 and May 2022: deployed six releases that included the development of a new system for FSA officials to use to manage and reconcile agency data. • August 2022: deployed the final release for the data management platform, which includes additional analytics capabilities.	None – project is complete.
Enterprise Data Strategy—was to establish a data strategy that outlined how FSA will improve data standardization and compliance.	• September 2020: completed the data strategy plan that identifies, among other things, controls for data quality, data security, and privacy.	None – project is complete.
myFSAPay—was to develop a payment pilot that provided student aid recipients electronic banking functionality.	• February 2020: launched the payment vehicle pilot, including a mobile application. • June 2021: ended payment vehicle pilot and completed project.	None – project is complete.

Project/purpose	Key completed milestones	Key outstanding milestones
National Student Loan Data System—was to develop a modernized loan data system that stores, maintains, and provides reporting capabilities for student, borrower, and partner data.	• July 2022: deployed the modernized loan data system that stores, maintains, and provides reporting capabilities for student, borrower, and partner data.	None – project is complete.
Partner Participation and Oversight (PPO)[a]—to develop and deploy a modernized system that provides school partners with a central point of access to FSA's tools and resources to enable management of the Title IV student aid programs.	• March 2020: executed initial contract with system development vendor. • April 2021: developed and deployed release 1.0 (the first of three major releases), of the first of the three large segments of PPO (referred to as milestones), which resulted in the retirement of the Information for Financial Aid Professionals website. This release also included the launch of the FSA Partner Connect digital portal (https://fsapartners.ed.gov). • August 2021: approved the requirements for release 2.0 of the first milestone, which is intended to include the Application for Approval to Participate in the Federal Student Financial Aid Program (known as e-App).	• Spring 2023: develop and deploy release 2.0 and retire the legacy Postsecondary Education Participants System. • Summer 2023: finalize requirements, develop, and test release 3.0 of the first milestone, which is intended to include the launch of a school health dashboard and allow for the retirement of the Participation Management legacy system. • Date not yet determined: deploy functionality associated with the second and third milestones.
Target State Technical Architecture—was to work with experts across the enterprise and industry experts to document the target state architecture for the Next Gen program.	• May 2021: completed the Target Architecture document that identifies a detailed target state vision for Next Gen, including systems, security, infrastructure, and business capability architectural views.	None – project is complete.
Unified Servicing and Data Solution (previously called Enhanced Processing Solution and Interim Servicing Solution)— to serve as the loan servicing environment for more than 35 million borrowers.	• May 2022: announced a new solicitation for the Unified Servicing and Data Solution to solicit vendor proposals to develop and deploy a new loan servicing solution.	• Early 2023: award contract for system development. • Date not yet determined: develop and deploy a modernized loan servicing solution.

Source: GAO analysis of FSA's Next Gen program- and project-level documentation. | GAO-23-105333

[a]The PPO project is intended to be comprised of three large segments (which the project officials refer to as milestones). For milestone one, the project is intended to develop and deliver functionality in both major (e.g., 1.0) and minor (e.g., 1.1) releases. A major release is defined as a significant change or addition to the functionality or technical characteristics of the PPO portal. A minor release represents updates to an existing system consisting of bug fixes, changes to static content, patches, or any combination thereof. The project intended to deliver the first milestone in three major releases, release 1.0, release 2.0, and release 3.0, with intermittent minor releases. As of June 2022, the project delivered one major release, 1.0, and six minor releases, 1.1 through 1.6.

Next Gen Projects Lacked Planned Dates for Full Implementation and Experienced Delays on Interim Milestones

As of July 2022, FSA officials did not know when they would fully implement the majority of the ongoing Next Gen projects. Specifically, of the four remaining projects, the Next Gen officials stated they planned to implement one project in 2024, but did not identify dates for when they plan to fully implement the other three projects. Table 3 describes the current planned full implementation dates relative to the originally planned full implementation dates for the four projects.

Table 3: Original and Current Planned Full Implementation Dates for Ongoing Federal Student Aid (FSA) Next Gen Projects, as of June 2022

Project name	Original planned full implementation date	Current planned full implementation date as of June 2022
Business Process Operations	7/26/2022	3/31/2024
Digital and Customer Care	8/12/2021	Not yet determined
Partner Participation and Oversight	3/1/2022	Not yet determined
Unified Servicing and Data Solution (previously called Enhanced Processing Solution and Interim Servicing Solution)	9/22/2022[a]	Not yet determined

Source: GAO analysis of Next Gen FSA program documentation and data provided by FSA officials. | GAO-23-105333

[a]This date represented when FSA planned to implement the Interim Servicing Solution environment.

Next Gen officials stated that a key reason why they have not been able to commit to full implementation dates for Digital and Customer Care and PPO is because project officials were uncertain what additional features they will need to build and in what time frame. Officials stated that the key reason for the lack of a full implementation date for Unified Servicing and Data Solution is because FSA recently initiated its third attempt to modernize the loan servicing environment and has not yet established an implementation schedule.[22] Another major contributing factor for the incomplete schedules was that the Next Gen program did not follow

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[22]Next Gen's first attempt to modernize the loan servicing environment was called the Enhanced Processing Solution project. In April 2020, FSA canceled the project due to its failure to reach an agreement with the vendor after 12 weeks of negotiating. The second attempt was called the Interim Servicing Solution. This project was canceled due to changes in leadership priorities, acquisition strategies, and requirements, among other things. In February 2022, FSA restarted and renamed the project for the third time.

scheduling best practices, which we discuss in greater detail later in this report.

In addition to lacking full implementation dates, FSA has experienced several schedule delays with interim milestones on all four of Next Gen's ongoing projects. Table 4 describes the schedule delay reasons and associated length of delay, as identified by the Next Gen program officials.

Table 4: Schedule Delays Associated with the Federal Student Aid's (FSA) Ongoing Next Gen Projects, as of July 2022

Project name	Reasons for schedule delays	Delay length
Business Process Operations	• Time needed to review the solicitation before publicly announcing • Contract award bid protest	6 months
Digital and Customer Care	• Extra time needed in the planning phase to discuss security and data requirements with the vendor • Limited available staffing resources to review contract proposals	5 months
Partner Participation and Oversight (PPO)	• Contract modification award delayed • Scope complexity • Overlapping PPO activities • Lower than expected FSA team resources • Existing subject matter experts had excessive workloads	9 months
Unified Servicing and Data Solution (previously called Enhanced Processing Solution and Interim Servicing Solution)	• Contract award bid protest for Enhanced Processing Solution • First change in acquisition strategy once FSA leadership determined in July 2020 that a different acquisition strategy would be more effective than the Enhanced Processing Solution strategy • Second change in acquisition strategy due to new requirements • Change in administrations and other major priorities	Unknown[a]

Source: GAO analysis of FSA Next Gen program documentation and data provided by FSA officials. | GAO-23-105333

[a]Next Gen program officials stated that they are unable to provide specific time frames for the delays in delivering the loan servicing capabilities because the acquisition strategies for the first two solutions—Enhanced Processing Solution and Interim Servicing Solution—were canceled.

The schedule delays associated with the PPO project have affected FSA's ability to retire two legacy systems—the Postsecondary Education Participants System and the Participation Management system. In particular, although the office had not initially determined specific dates for retiring these two legacy systems, the Next Gen officials stated that FSA needs to support these legacy systems longer than expected by extending the existing legacy contracts.

The Next Gen program officials stated that they have efforts underway to address the issues that have caused the schedule delays. Specifically, program officials said they intend to develop more realistic schedules moving forward, allocate resources more efficiently, and hire additional

knowledgeable staff to support development. However, later in this report we discuss significant issues with the Next Gen's schedule estimation and management practices.

FSA Lacks a Full Accounting of Actual Next Gen Costs

As of June 2022, FSA reported that it had spent at least $502 million on Next Gen program, which reportedly only included spending on seven of the 13 projects it had originally initiated. This figure exceeds the September 2021 cost estimate of $415 million by $87 million.

Although Next Gen program officials reported actual spending associated with acquisitions and operations and maintenance, the cost figures were understated because they did not include actual government-related labor costs (e.g., government officials' time spent working on the project). Table 5 provides FSA's reported total spending to include actual acquisition and operations and maintenance costs for each of the original 13 Next Gen projects.

Table 5: Summary of the Federal Student Aid (FSA) Next Gen Program's Actual Project Costs (dollars in thousands), as of June 30, 2022

Project	Acquisition costs[a]	Operations and maintenance costs[b]	Project total costs
Free Application for Federal Student Aid (previously called Application Eligibility and Determination)[c]	Unknown	Not applicable	**Unknown**
Business Process Operations	$16,178	$29,652	**$45,829**
Cybersecurity[d]	Unknown	Not applicable	**Unknown**
Digital and Customer Care	$148,287	$168,984	**$317,271**
Enterprise Data Management and Analytics Platform Services	$47,393	$14,165	**$61,557**
Enterprise Data Strategy[e]	Unknown	Not applicable	**Unknown**
Unified Servicing and Data Solution (previously called Enhanced Processing Solution and Interim Servicing Solution)	$548	Not applicable	**$548**
Identity and Access Management	$3,147	$8,848	**$11,995**
myFSApay[f]	Unknown	Not applicable	**Unknown**
National Student Loan Data System	$5,161	$7,690	**$12,851**
Optimal Processing Solution[g]	Unknown	Not applicable	**Unknown**
Partner Participation and Oversight	$32,062	$20,399	**$52,461**
Technical Architecture[h]	Unknown[h]	Not applicable	**Unknown**
Total	**$252,775**	**$249,737**	**$502,512**

Note: Numbers may not add to totals because of rounding.

[a]Acquisition costs refer to the amount spent by FSA in providing procurement and acquisition support to a project. Additionally, it also include costs associated with development, enhancement, and modernization activities that FSA performed for the project.

[b]Operations and maintenance costs refers to the cost of activities that include conducting routine maintenance on equipment and daily operations in order for the system to operate properly.

[c]Next Gen program officials stated that the Application Eligibility and Determination project was moved from the Next Gen program to the Student Aid and Borrower Eligibility Reform Initiative prior to awarding a contract.

[d]Next Gen program officials reported that they canceled the Cybersecurity project because FSA had historically managed cybersecurity through the Technology Directorate and it decided to continue with that approach.

[e]Next Gen program officials stated that the Next Gen program did not need to incur system development costs or award a contract to develop the Enterprise Data Strategy document.

[f]Next Gen program officials said that the myFSApay pilot did not have direct costs or an associated budget, because each participating school and card company was responsible for providing the funds to support the pilot.

[g]Next Gen program officials stated that they canceled the Optimal Processing Solution project after the passage of the Fostering Undergraduate Talent by Unlocking Resources for Education and Free Application for Federal Student Aid Simplification Acts.

[h]Next Gen program officials stated that the Technical Architecture project had no explicit costs and associated budget for this project.

For seven of the 13 projects,[23] the spending data reported by Next Gen officials in table 5 included contractor-related costs, but not government-related labor costs. Regarding the remaining six projects, Next Gen officials were unaware of how much had been actually spent on these projects. The reason the officials were unaware was because these projects did not incur contractor-related costs,[24] and while government officials spent time working on each of these projects, these types of costs were not tracked.

This gap in tracking government-related labor costs is contrary to best practices. Specifically, GAO's *Cost Estimating and Assessment Guide*, our prior report on effective time and attendance reporting, and the Project Management Institute have reported that programs should track

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[23]These seven projects consist of: Business Process Operations, Digital and Customer Care, Enterprise Data Management and Analytics Platform Services, Unified Servicing and Data Solution (previously called Enhanced Processing Solution and Interim Servicing Solution), Identity and Access Management, National Student Loan Data System, and PPO.

[24]These six projects consist of: Free Application for Federal Student Aid (Previously called Application Eligibility and Determination), Cybersecurity, Enterprise Data Strategy, myFSApay, Optimal Processing Solution, and Technical Architecture.

all costs in order to effectively manage the program and make resource adjustments accordingly.[25]

Next Gen program officials stated that they did not track government-related labor costs because the department's time and attendance system only tracks whether government staff worked their full schedule and not the time spent on specific projects. Officials added that many of their government staff work on multiple programs, in addition to Next Gen, so it is difficult for them to isolate exactly how much government time is spent working specifically on Next Gen. However, detailed time and attendance accounting features that allow employees to track specific time spent on various projects readily exist in the government.

Until FSA takes steps to implement processes for accurately tracking and monitoring costs associated with Next Gen to include government-related labor costs, FSA will be unable to have an accurate account of Next Gen spending, or to be able compare actual costs against planned estimates.

FSA's Cost Guidance and Next Gen's Estimates Did Not Align with Estimation Best Practices

FSA's schedule and cost shortcomings reflect its lack of alignment with GAO best practices. Specifically, FSA's cost estimation development guidance did not fully incorporate steps for developing reliable estimates, raising the possibility that acquisition programs are developing poor quality cost estimates. In addition, FSA developed cost and schedule estimates for the Next Gen program that exhibited significant weaknesses in addressing best practices in cost and schedule estimation and were, therefore, unreliable. Specifically, the Next Gen program's cost and schedule estimates did not substantially or fully meet the best practices for any of the four characteristics of a reliable cost or schedule estimate. Until these weaknesses are addressed, FSA cost and schedule estimates will continue to be unreliable. In turn, this will impair the ability of senior leadership to make informed decisions on the program's future.

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[25]GAO-20-195G; GAO, *Maintaining Effective Control over Employee Time and Attendance Reporting,* GAO-03-352G (Washington, D.C.: Jan. 1, 2003); and Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge*, 6th ed. (2017). PMBOK is a trademark of Project Management Institute, Inc.

FSA's Cost Estimating Guidance Did Not Fully Incorporate Steps Needed to Guide Programs to Developing Reliable Estimates

The GAO *Cost Estimating and Assessment Guide* identifies 12 steps that, when incorporated into an agency's cost estimating guidance, should result in reliable and valid cost estimates that management can use to make informed investment decisions.[26] (See fig. 2 for information on these steps.) A reliable cost estimate is critical to the success of any IT modernization effort. Such an estimate provides the basis for informed decision making, realistic budget formulation and program resourcing, and accountability for results.

Figure 2: GAO's 12 Steps for Developing a Reliable Cost Estimate

Analysis, presentation, and updating the estimate steps can lead to repeating previous assessment steps

1. Define the estimate's purpose
2. Develop the estimating plan
3. Define the program
4. Determine the estimating structure
5. Identify ground rules and assumptions
6. Obtain the data
7. Develop the point estimate and compare it to an independent cost estimate[a]
8. Conduct sensitivity analysis[b]
9. Conduct a risk and uncertainty analysis[c]
10. Document the estimate
11. Present estimate to management for approval
12. Update the estimate to reflect actual costs/charges

Initiation and research
What is being estimated and why

Assessment
Cost assessment steps are iterative and can be accomplished in varying order or concurrently

Analysis
The confidence in the point or range of the estimate is crucial to the decision maker

Presentation
Documentation and presentation are key to a cost estimating decision

Source: *GAO Cost Estimating and Assessment Guide.* | GAO-23-105333

Text of Figure 2: GAO's 12 Steps for Developing a Reliable Cost Estimate

Initiation and research
What is being estimated and why

1. Define the estimate's purpose

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[26]GAO-20-195G.

2. Develop the estimating plan

Assessment
Cost assessment steps are iterative and can be accomplished in varying order or concurrently

3. Define the program

4. Determine the estimating structure

5. Identify ground rules and assumptions

6. Obtain the data

7. Develop the point estimate and compare it to an independent cost estimate /a/

Analysis
The confidence in the point or range of the estimate is crucial to the decision maker

8. Conduct sensitivity analysis /b/

9. Conduct a risk and uncertainty analysis /c/

10. Document the estimate

Presentation
Documentation and presentation are key to a cost estimating decision

11. Present estimate to management for approval

12. Update the estimate to reflect actual costs/charges

Analysis, presentation, and updating the estimate steps can lead to repeating previous assessment steps

Source: GAO Cost Estimating and Assessment Guide. | GAO-23-105333

[a]The point estimate is the best guess estimate, given the underlying data. High-quality cost estimates usually fall within a range of possible costs, the point estimate being between the best and worst case extremes.

[b]A sensitivity analysis examines the effects of changing assumptions and ground rules, one at a time, to determine how they impact the overall estimate.

[c]Quantifying risk and uncertainty is a cost estimating best practice; quantitative risk and uncertainty analysis provides a way to assess the variability of the point estimate.

FSA's guidance on how to prepare cost estimates for IT acquisition programs did not fully incorporate all 12 steps of a reliable cost estimate process.[27] In particular, FSA's cost estimating guidance

- met two steps,

- substantially met four steps,

- partially met four steps,

- minimally met one step, and

- did not meet one step.

Table 6 summarizes the 12 steps for developing a reliable cost estimate and our assessment regarding whether FSA's guidance incorporated each step, as of June 2022.

Table 6: Summary of the Extent to Which Federal Student Aid (FSA) Guidance for IT Acquisition Programs Incorporated GAO's 12 Steps Needed to Develop a High-Quality, Reliable Cost Estimate, as of June 2022

Step	GAO assessment
Define the estimate's purpose, including determining the estimate's overall scope and determining the required level of detail for the estimate	**Partially met.** FSA's guidance explained that projects should include total costs, including direct and indirect product costs, expenses, and apportioned overhead for the project. However, the guidance did not specify what accounts for total project costs and it did not require a specific level of detail for the cost estimate. For example, the guidance did not address the need to include government costs, sunk costs, or future operations, maintenance, and disposal costs.
Develop the estimating plan, including developing a written study plan that describes the cost estimating approach and includes a schedule to complete the cost estimate	**Partially met.** FSA's guidance provided information about the plan for developing core deliverables for each stage of a project's lifecycle, such as a project management plan. However, details about planning for a cost estimate were not included. In particular, the guidance did not include a requirement related to developing a plan that describes the cost estimating approach or a schedule to complete the cost estimate.
Define the program's technical baseline and obtain management review[a]	**Substantially met.** FSA's guidance provided requirements that projects should perform a technical review and program definition process, including defining the business need for the proposed project, and the potential of requirements conflicts. However, FSA's guidance did not require management review of the technical baseline.

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[27]The guidance we reviewed included FSA's lifecycle management methodology, management stage gate review standard operating procedures, annual planning budget estimation guidance, budget initiative request guidance, and independent government cost estimate guide, among other things.

Step	GAO assessment
Determine the estimating structure, including defining a work breakdown structure that is standardized[b]	**Partially met.** FSA's guidance specified that projects should develop a work breakdown structure. The guidance also provided a cost estimate template, which includes fields for the investment team to reference the work breakdown structure elements that impact a project's projected costs. However, the guidance did not provide additional information about what to include in the work breakdown structure, or how to develop one. In addition, FSA's budget estimation guidance provided conflicting guidance that stated that a work breakdown structure may not be necessary to support a cost estimate.
Identify ground rules and assumptions, including documenting and tracing risks associated with assumptions to specific work breakdown structure elements	**Substantially met.** FSA's guidance required that projects develop ground rules and assumptions for the cost estimate. However, because of the conflicting guidance on whether a work breakdown structure should be developed or not, tracing risks to specific work breakdown structure elements may not possible.
Obtain the data, including creating a data collection plan	**Met.** FSA's guidance specified that data collection for cost, schedule, and performance should be performed. FSA also provided guidance related to data availability and data management.
Develop the point estimate, including time-phasing the results by spreading costs in the years they are expected to occur	**Partially met.** FSA's guidance explained different cost estimating methods. For example, the guidance called for traceability of the estimate and explains how different methodologies can be used to cross-check the estimate and the need to cross-check data. However, the guidance did not discuss time-phasing the point estimate.
Conduct sensitivity analysis, including examining the effects of changing single assumptions	**Not met**. FSA's guidance did not require a sensitivity analysis.
Conduct risk and uncertainty analysis, including identifying the steps that should be performed	**Minimally met**. FSA's guidance discussed the concepts of risk and uncertainty in cost estimates. However, the guidance did not explain the process that projects should use to support this type of analysis.
Document the estimate, including documenting all steps performed to develop the estimate	**Substantially met.** FSA's cost estimate template provided high-level requirements on documenting a cost estimate. In addition, other FSA guidance stated that the documentation should describe the cost estimating process, data sources, and methods in sufficient detail to allow analysts to reconstruct the estimate. However, the guidance was at such a high-level that officials responsible for documenting an estimate for an FSA acquisition program may be inconsistent in how they document all parameters, assumptions, descriptions, methods, and calculations used to develop a cost estimate.
Present the estimate to management for approval	**Substantially met.** FSA's guidance required that management reviews the project's estimate and approves the related content. However, as discussed earlier, the guidance did not require a sensitivity analysis and the process for conducting risk and uncertainty analysis was not defined. As such, the results associated with these important analyses may not be presented to management.
Update the estimate to reflect actual costs and changes	**Met.** FSA's guidance stated that projects should regularly update cost estimates and budget requests.

Legend: Met—FSA provided complete evidence that satisfies all the criteria; Substantially met—FSA provided evidence that satisfies more than half of the criteria, but not all the criteria; Partially met—FSA provided evidence that satisfies about half of the criteria; Minimally met—FSA provided evidence that satisfies less than half of the criteria; Not met—FSA did not provide evidence that satisfies any of the criteria.

Source: GAO analysis of FSA cost estimation guidance as of June 2022. | GAO-23-105333

[a]A technical baseline description is a document or set of documents that describe the program's or project's purpose, system, performance characteristics, and system configuration, among other things.

[b]A work breakdown structure is a framework for planning and assigning responsibility for work necessary to accomplish a program's objectives. It deconstructs a program's end product into smaller specific elements that are suitable for management control.

In response to our assessment, FSA officials stated that they thought the existing guidance met the 12 cost estimating steps included in GAO's *Cost Estimating and Assessment Guide*. In particular, FSA officials explained that, in addition to their cost estimation guidance documents, the program management office also relies on other supporting documentation that meets the gaps in the guidance we assessed. However, these supporting documents, such as the Lifecycle Management Methodology guidance, did not include guidance on how to conduct the risk and uncertainty analysis, which can be a very technical and complicated analysis. This was also the case for the other cost estimating steps where the guidance did not fully meet the requirements associated with that step.

Until FSA establishes guidance that includes all of 12 steps of the cost estimating process identified in the GAO *Cost Estimating and Assessment Guide*, the office is less likely to develop reliable cost estimates for its IT acquisition programs. Further, FSA risks being unable to effectively estimate funding needs for IT investments and using unreliable data to make budgetary decisions.

FSA's Cost Estimate for the Next Gen Program Was Unreliable

Employing reliable cost estimates is crucial for realistic program planning, budgeting, and management. Cost estimates are necessary for government acquisition programs for many reasons, including to support decisions about funding one program over another, to develop annual budget requests, and to evaluate resource requirements at key decision points. Moreover, having a realistic estimate of projected costs makes for effective resource allocation, and it increases the probability of a program's success.

According to the GAO *Cost Estimating and Assessment Guide*, the four characteristics of a high-quality, reliable cost estimate are that it is comprehensive, well-documented, accurate, and credible, as shown in figure 3.[28]

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[28]GAO-20-195G.

Figure 3: Characteristics of Reliable Cost Estimates

Comprehensive
- Fully define the program
- Include complete life-cycle costs
- Reflect current schedule
- Is technically reasonable

Accurate
- Uses the best methodology from the data collected
- Adjusted for inflation
- Updated regularly
- Based on a historical record

Are all costs included?

Can the estimate be recreated?

Is estimate constructed with appropriate data and methods?

Is the estimate unbiased?

Well-documented
- Easily replicated and updated
- Supported by documentation
- Identify source data
- Approved by management

Credible
- Disclose limitations
- Include sensitivity analysis of key assumptions
- Include risk and uncertainty analysis
- Corroborated by independent cost estimate

Source: GAO *Cost Estimating and Assessment Guide*; images: TriMaker/stock.adobe.com. | GAO-23-105333
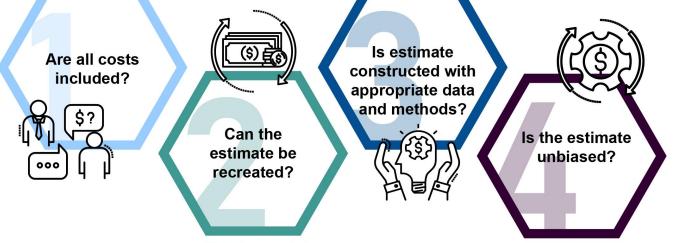
Text of Figure 3: Characteristics of Reliable Cost Estimates

- **Comprehensive**
  - Fully define the program
  - Include complete life-cycle costs
  - Reflect current schedule
  - Is technically reasonable
- **Well-documented**
  - Easily replicated and updated
  - Supported by documentation

- • Identify source data

- • Approved by management

- **Accurate**

  - • Uses the best methodology from the data collected

  - • Adjusted for inflation

  - • Updated regularly

  - • Based on a historical record

- **Credible**

  - • Disclose limitations

  - • Include sensitivity analysis of key assumptions

  - • Include risk and uncertainty analysis

  - • Corroborated by independent   cost estimate

Source: GAO Cost Estimating and Assessment Guide; images: TriMaker/stock.adobe.com. | GAO-23-105333

FSA's cost estimate for Next Gen was unreliable because it did not substantially meet any of the four characteristics of a high-quality, reliable cost estimate. Specifically, the cost estimate minimally met the comprehensive, accurate, and credible characteristics, and did not meet the well-documented characteristic of a reliable cost estimate. Table 7 summarizes our assessment of FSA's Next Gen cost estimate compared to these characteristics, as of June 2022.

Table 7: Analysis of the Federal Student Aid (FSA) Next Gen Program's Cost Estimate Using GAO's *Cost Estimating and Assessment Guide*, as of June 2022

Cost estimating characteristic	GAO assessment
Comprehensive, including identifying all lifecycle costs and basing the cost estimate on a technical baseline description that completely defines the program and reflects the current schedule	**Minimally met.** There were significant gaps in the comprehensiveness of costs that were included in the program's cost estimate. The estimate did not identify the total operations and maintenance-related costs that would be needed to support the systems associated with the projects that were included in the estimate.
	The cost estimate also did not cover the same timespan identified in the schedule. In particular, the cost estimate did not include costs beyond fiscal year 2023, whereas the schedule identified a September 2024 finish date. Further, there was no underlying technical baseline for the Next Gen program. Without fully accounting for lifecycle costs, management will have difficulty successfully planning program resource requirements and making informed decisions.

Cost estimating characteristic	GAO assessment
Well-documented, including establishing documentation that describes how the estimate was developed, the source data and estimating methodology that was used, and providing evidence that the cost estimate documentation was reviewed and accepted by management	**Not met.** The cost estimate documentation did not describe how the estimate was developed. FSA did not document the data sources and estimating methodologies used to support the cost estimate. Lastly, FSA did not provide documentation to show that its management had approved the Next Gen program's cost estimate. The lack of well-documented cost data may result in questions about the approach or data used to create the estimate. In addition, without sufficient supporting documentation, management and oversight may not be convinced that the estimate is credible.
Accurate, including taking steps to ensure that the cost estimate is based on a historical record of cost estimating, adjusted properly for inflation, contains few, if any, mistakes, and is regularly updated to reflect program changes and actual costs	**Minimally met.** The cost estimate consisted of a spreadsheet that summarized costs for underlying Next Gen projects that were then rolled up into an overall cost estimate. However, all of the numbers were hardcoded in the spreadsheet. Therefore, we did not have insight into the underlying historical data, how inflation may or may not have been applied, and whether the cost estimate contained errors. Additionally, there was no indication on how often FSA and the Next Gen program officials updated the Next Gen program's cost estimate. Without a documented comparison between the current estimate that is updated with actual costs and the old estimate, cost estimators cannot determine how well they are estimating and how the program is changing over time.
Credible, including conducting sensitivity analysis, cross-checks on major cost elements, and risk and uncertainty analysis	**Minimally met.** The estimate did not include a sensitivity analysis and cross-checks on major elements were not performed to validate results. Further, while the Next Gen program office provided a risk management plan and a risk register for the Next Gen program, there was no indication that risks were analyzed in the context of a quantifiable risk assessment that evaluated the impacts of risks on the estimate. Lacking risk and uncertainty analysis, management cannot determine a defensible level of contingency that is necessary to cover increased costs resulting from unexpected design complexity, incomplete requirements, technology uncertainty, and other uncertainties.

Legend: Met—FSA provided complete evidence that satisfies all the criteria; Substantially met—FSA provided evidence that satisfies more than half of the criteria, but not all the criteria; Partially met—FSA provided evidence that satisfies about half of the criteria; Minimally met—FSA provided evidence that satisfies less than half of the criteria; Not met—FSA did not provide evidence that satisfies any of the criteria.

Source: GAO analysis of Next Gen FSA program's cost estimation and associated documentation as of June 2022. | GAO-23-105333

Next Gen program officials stated that the reason for the gaps in the lifecycle cost estimate was because the scope, schedule, and costs associated with the program were likely to change. This is due to a rapidly evolving environment where the Administration's priorities can take precedence over the original plans. As a result, program officials decided not to estimate any costs associated with the program beyond 2023. In addition, the program officials explained that they lacked the staffing resources and the funding required to fully meet the four characteristics of a reliable cost estimate.

However, lack of resources for the overall Next Gen program does not appear to have been a key constraint thus far. As mentioned previously, as of June 2022, FSA had already spent at least $500 million on the Next Gen program. This represented at least $87 million more than the overall September 2021 lifecycle estimate of $415 million (as previously mentioned, government labor costs were not factored into the current spending total).

Until FSA develops a new cost estimate that addresses the limitations described above by fully applying the four characteristics of a reliable cost estimate, the office risks being unable to effectively estimate future funding needs for the Next Gen program. It also risks using unreliable data to make budgetary decisions to hold the program accountable. As such, it faces an increased likelihood of cost overruns and unmet performance targets for the work associated with the remaining Next Gen projects.

FSA's Schedule for the Next Gen Program Was Unreliable

The success of a program depends, in part, on having an integrated and reliable master schedule. The schedule provides not only a roadmap for project execution, but also the means by which to gauge progress, identify and resolve potential problems, and promotes accountability at all levels of the program. Among other things, scheduling allows program management to decide between possible sequences of activities, determine the flexibility of the schedule according to available resources, predict the consequences of managerial action or inaction on events, and allocate contingency plans to mitigate risks.

According to the *GAO Schedule Assessment Guide*, the four characteristics of a high-quality, reliable schedule are that it is comprehensive, well-constructed, credible, and controlled. Further, our schedule guide identifies 10 best practices that can be mapped to these four characteristics, as shown in figure 4.[29]

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[29]GAO-16-89G.

Figure 4: Characteristics of a Reliable Schedule

Comprehensive:

- **Practice 1: Capturing all activities** – include all activities as defined in the program's work breakdown structure
- **Practice 3: Assigning resources to all activities** – assign resources for labor, materials, travel, facilities, equipment, and the like needed to do the work and whether those resources will be available when needed
- **Practice 4: Establishing the durations of all activities** – realistically reflect how long each activity will take, allowing for discrete progress measurement

Well-constructed:

- **Practice 2: Sequencing all activities** – ensure all activities are logically sequenced with predecessor and successor logic and, when used, date constraints and lags are limited and justified
- **Practice 6: Confirming that the critical path is valid** – include a critical path that determines the activities that drive the program's earliest completion date
- **Practice 7: Ensuring reasonable total float** – identify total float that accurately reflects the schedule's flexibility

Credible:

- **Practice 5: Verifying that the schedule can be traced horizontally and vertically** – link products and outcomes associated with other sequenced activities and reflect the order of events necessary to achieve aggregated products or outcomes and the varying levels of activity, supporting activity, and subtasks
- **Practice 8: Conducting a schedule risk analysis** – reflect a level of confidence in meeting a program's completion date based on data about risks for the program and reflect the necessary schedule contingency and prioritized risks based on a robust schedule risk analysis

Controlled:

- **Practice 9: Updating the schedule using actual progress and logic** – ensure the schedule is updated regularly by schedulers trained in critical path method scheduling, statused using actual progress and logic to realistically forecast dates for program activities, and accompanied by a schedule narrative that describes updates to the current schedule
- **Practice 10: Maintaining a baseline schedule** –performance is compared against a baseline schedule to determine variances from the plan and is accompanied by a corresponding basis document that explains the overall approach to the program, defines assumptions, and describes unique features of the schedule

Source: *GAO Schedule Assessment Guide*; images: TriMaker/stock.adobe.com. | GAO-23-105333

Text of Figure 4: Characteristics of a Reliable Schedule

- **Comprehensive:**

  - Practice 1: Capturing all activities – include all activities as defined in the program's work breakdown structure

  - Practice 3: Assigning resources to all activities – assign resources for labor, materials, travel, facilities, equipment, and the like needed to do the work and whether those resources will be available when needed

  - Practice 4: Establishing the durations of all activities – realistically reflect how long each activity will take, allowing for discrete progress measurement

- **Well-constructed:**
    - Practice 2: Sequencing all activities – ensure all activities are logically sequenced with predecessor and successor logic and, when used, date constraints and lags are limited and justified
    - Practice 6: Confirming that the critical path is valid – include a critical path that determines the activities that drive the program's earliest completion date
    - Practice 7: Ensuring reasonable total float – identify total float that accurately reflects the schedule's flexibility
- **Credible:**
    - Practice 5: Verifying that the schedule can be traced horizontally and vertically – link products and outcomes associated with other sequenced activities and reflect the order of events necessary to achieve aggregated products or outcomes and the varying levels of activity, supporting activity, and subtasks
    - Practice 8: Conducting a schedule risk analysis – reflect a level of confidence in meeting a program's completion date based on data about risks for the program and reflect the necessary schedule contingency and prioritized risks based on a robust schedule risk analysis
- **Controlled:**
    - Practice 9: Updating the schedule using actual progress and logic – ensure the schedule is updated regularly by schedulers trained in critical path method scheduling, statused using actual progress and logic to realistically forecast dates for program activities, and accompanied by a schedule narrative that describes updates to the current schedule
    - Practice 10: Maintaining a baseline schedule –performance is compared against a baseline schedule to determine variances from the plan and is accompanied by a corresponding basis document that explains the overall approach to the program, defines assumptions, and describes unique features of the schedule

Source: GAO Schedule Assessment Guide; images: TriMaker/stock.adobe.com. | GAO-23-105333

FSA's schedule for the Next Gen program was unreliable because it did not fully or substantially meet any of the four characteristics of a reliable schedule estimate. The schedule partially met one of four characteristics of a reliable schedule—credible—and minimally met the remaining characteristics—comprehensive, well-constructed, and controlled. Table 8

summarizes our assessment of FSA program's schedule compared to
best practices for schedules, as of June 2022.

Table 8: Assessment of the Federal Student Aid (FSA) Next Gen Program Schedule Estimate Using GAO's Schedule Assessment Guide, as of June 2022

Schedule estimating characteristic	Best practices	GAO assessment
Comprehensive	Captures all activities.	**Minimally met.** The program-level schedule only included efforts from June 2017 to September 2024. However, as discussed earlier, Next Gen may continue beyond 2024 because the program has not yet determined when it will implement the majority of the remaining Next Gen projects. In addition, in October 2020, the FSA officials estimated the program would not be fully implemented until September 2026. Further, activity names in the program-level schedule were not unique and there were not clear start and finish milestones in the schedule. As such, management is not able to use this schedule to account for the total scope of work.
	Assigns resources to all activities.	**Minimally met.** Next Gen's program-level schedule did not include the resources needed to support the schedule. Until the program includes resources in its schedule, management will be limited in its ability to compute total labor and equipment hours, calculate total project and per-period cost, and resolve resource conflicts.
	Establishes durations of all activities.	**Partially met.** Although estimated detail activity durations for near-term efforts generally should be no longer than the reporting period established by the program, the activity durations for about 37 percent of the remaining activities in Next Gen's schedule were longer than the regular reporting period. As a result, since shorter durations of the detail activities allow for more precise measurement of accomplishments, these longer activity durations may make it difficult for management to gauge progress.
Well-constructed	Sequences all activities.	**Minimally met.** The program-level schedule was not properly sequenced and did not identify interdependencies. For example, the program-level schedule contained date constraints preventing activities from responding to network logic, including actual progress and availability of resources. Until the program identifies interdependencies between activities program officials will be limited in their ability to properly calculate dates and predict changes in the future.
	Confirms that the critical path is valid.	**Minimally met.** FSA officials stated that they used the critical path to focus on activities that could detrimentally affect key activities and milestones. However, we could not determine a valid critical path within FSA's program-level schedule for the Next Gen program. In addition, we found critical path validity issues, including the use of lags and leads that affect the schedule's critical path continuity, in five project-level schedules that we assessed. Without a valid critical path, management cannot focus on activities that will detrimentally affect the key program milestones and deliveries if they slip.
	Ensures reasonable total float.[a]	**Minimally met.** In the program-level schedule, 346 (98 percent) of remaining activities in the program-level schedule had total float greater than 2 working months. However, Next Gen officials were not able to determine if 2 months of float length was reasonable since they stated they did not monitor total float. The Next Gen officials stated they did not monitor total float because they track specific tasks weekly. If management is using the schedule to identify and track specific tasks, then total float, by definition, cannot be ignored. Until management ensures that the schedule reflects reasonable and valid amounts of total float, the critical path, which is defined by the availability of total float, will continue to be in jeopardy.

Schedule estimating characteristic	Best practices	GAO assessment
Credible	Can be horizontally and vertically traced.[b]	**Partially met.** The program-level schedule was not horizontally traceability. In particular, the schedule included manually scheduled activities so it suffers from missing logic links that impact the ability to update the schedule automatically. Any logic errors between summary, intermediate, and detailed schedules will cause inconsistent dates between schedules and will cause different expectations between management and activity owners. Unless the schedule is horizontally traceable, activities with durations that are greatly extended will have no effect on key milestones.
		In addition, although we were able to match select dates between the current schedule and related program management documentation for vertical traceability, the lack of a work breakdown structure makes matching deliverables and dates between documents difficult. Without vertical traceability, there may be little confidence that all consumers of the schedule are getting the same correct schedule information.
	Conducted a robust schedule risk analysis.	**Minimally met.** Although Next Gen program officials provided a schedule risk analysis, it was not robust and contained limitations. Specifically, there was no evidence of the key characteristics of a work breakdown structure, such as logical dependencies, in the schedule risk analysis documents. In addition, the schedule itself was not dynamic, and therefore was not able to support a valid risk simulation, as described in the GAO schedule guide. If a schedule risk analysis is not sufficiently performed, management cannot determine the likelihood of meeting the set completion date or the contingency needed to provide an acceptable level of certainty for completion by a specific date.
Controlled	Updated regularly, using actual progress and logic.	**Minimally met.** Next Gen program officials stated that they updated the program-level schedule weekly, but it had several status dates with none matching the status date in the schedule file name. The updated schedule was also not accompanied by a schedule narrative document that archives key features of the current update, such as explanation for changes and status of critical and near-critical paths. According to the GAO schedule guide, a schedule narrative should accompany the updated schedule to provide decision makers and auditors a log of changes and their effect, if any, on the schedule time.
	Maintains a baseline schedule.	**Minimally met.** The program-level schedule indicated that it was last baselined on September 17, 2021, but because baseline dates were not stored in the current version of the schedule, variances between estimated and actual dates could not be easily calculated. The Next Gen program officials also provided a schedule management plan as the schedule basis document. However, this plan was missing key elements, such as background and scope information, key assumptions and a description of the structure of the schedule, key fields, resource categories, the baseline critical and near-critical paths, and a discussion of schedule risk analysis or contingency. As a result, management may be lacking a clear basis for assessing program performance relative to the baseline schedule.

Legend: Met—FSA provided complete evidence that satisfies all the criteria; Substantially met—FSA provided evidence that satisfies more than half of the criteria, but not all the criteria; Partially met—FSA provided evidence that satisfies about half of the criteria; Minimally met—FSA provided evidence that satisfies less than half of the criteria; Not met—FSA did not provide evidence that satisfies any of the criteria.

Source: GAO analysis of the Next Gen FSA program's schedule and associated documentation as of June 2022. | GAO-23-105333

[a]Total float is the amount of time an activity can slip before the program's end date is affected.

[b]Horizontal traceability demonstrates that the overall schedule is rational, has been planned in a logical sequence, accounts for the interdependence of details activities and planning packages, and provides a way to evaluate current status. Vertical traceability demonstrates the consistency of dates, status, and scope requirements between different levels of a schedule—summary, intermediate, and detailed.

The Next Gen program officials acknowledged that they were not fully addressing the best practices associated with a reliable schedule for the

program-level schedule estimate. The officials explained that FSA did not have the necessary skills to manage the schedule in accordance with the best practices. The program officials added that they have had to remove certain staff from managing the schedule due to their lack of project-level scheduling skills and integrated master schedule management skills.

To address this skills gap moving forward, in July 2022, Next Gen program officials stated that they had recently received approval to post a job announcement to hire an additional scheduler. However, as of July 2022, the vacant position had not yet been filled. The Next Gen officials also stated they were working with other FSA officials to determine if the office would post an additional job announcement to hire a second scheduler that could be used to support multiple FSA projects.

Following our initial assessment of the schedule in April 2022, the Next Gen program officials stated that the program-level schedule was not a good schedule to evaluate against the best practices described in the *GAO Schedule Assessment Guide* for three reasons. First, they stated that they intentionally avoided adding too much detail to their program-level schedule to make it easier for their senior management to review. Second, they stated that they have contractual issues with their vendors not wanting to provide proprietary information on how they manage their independent schedules because this information could potentially be shared with other vendors. Consequently, this reduces the Next Gen officials' insight into the individual schedules that are intended to roll up into the program-level schedule. In addition, officials stated that they have experienced data integrity issues due to the number of project schedules being managed independently.

However, as described in our *GAO Schedule Assessment Guide*, a program-level schedule should include the summary, intermediate, and all detailed schedules. Further, one schedule should ideally serve as the summary, intermediate, and detailed schedule by simply rolling up lower levels of effort into summary activities or higher-level work breakdown structure elements.

Until FSA revises the Next Gen program's schedule in accordance with the four characteristics of a reliable schedule, the office runs the risk of additional delays as they work to implement each of the program's remaining projects. Accordingly, FSA schedule estimates will continue to be unreliable, thus limiting the ability of senior leadership to make informed decisions about the program's future.

PPO Project Partially Implemented Selected Scope, Quality, and Stakeholder Practices

IT project management best practices are intended to guide the successful development of investments. To help agencies with implementing IT project management best practices, the Project Management Institute identified numerous practices related to several management areas, including (1) scope management, (2) system development quality management, (3) and stakeholder management, among other areas and practices.[30] The PPO project partially implemented each of the 11 practices from the three selected management areas—four practices from the scope management area, three from the quality management area, and four from the stakeholder management area.

PPO Project Partially Implemented Selected Scope Management Practices

According to the PMBOK® Guide, the purpose of implementing scope management practices is to ensure that the project includes all the work required to complete the project successfully. Further, managing the project scope includes defining and controlling what is and is not included in the project. The PMBOK® Guide includes the following four selected best practices for effective scope management: planning scope

Partner Participation and Oversight (PPO)

The PPO project—one of Next Gen's most critical and expensive projects focused on strengthening partnerships with participating schools—is comprised of three large segments (which project officials refer to as milestones).

The project plans to deliver the first milestone in three major releases, with intermittent minor releases. As of June 2022, the project delivered one major release and six minor releases. These releases resulted in the development of a modernized website that provides school partners with streamlined access to information and tools for managing Title IV student aid programs.

By spring 2023, the project planned to deploy its second major release. Among other things, this release is to deliver a modernized management information system to maintain eligibility, demographic, financial, and default rate data about schools and lenders. By summer 2023, the project plans to develop and deploy the third major release which is expected to be a school health dashboard.

The project has not begun defining the time frames for the remaining two large milestones which, among other things, are intended to enable centralized customer service delivery to school partners, provide additional analytical capabilities for oversight, and redesign partner training.

Source: GAO analysis of PPO project documentation. | GAO-23-105333

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[30]Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge*, 6th ed. (2017). PMBOK is a trademark of Project Management Institute, Inc.

management, collecting requirements, validating scope, and controlling scope.[31]

The PPO project partially implemented these four practices. Table 9 describes the best practices and provides our assessment of the PPO project's implementation of the practices.

Table 9: Summary of the Partner Participation and Oversight (PPO) Project's Implementation of the Four Selected Scope Management Practices

Best practice	GAO rating
Plan scope management by creating a project management plan that documents how the project's baseline requirements will be defined, validated, and controlled, including a requirements management plan that documents metrics that will be used to track the baseline requirements.	Partially implemented
Collect requirements by determining, documenting, and managing stakeholder needs and requirements to meet project objectives, including how detailed requirements meet the business need for the project and developing and routinely updating a requirements traceability matrix that fully traces requirements to all associated test scenarios.	Partially implemented
Validate scope by formalizing acceptance of the completed project deliverables, including comparing the actual results to the requirements baseline to determine if a change, corrective action, or preventative action is necessary and updating the requirements traceability matrix to capture the results and method of validation.	Partially implemented
Control scope by monitoring the status of the project and system scope and managing changes to the requirements baseline, including capturing work performance data and information to identify scope variances and their causes.	Partially implemented

Legend: ●=Fully implemented ◑=Partially implemented ○=Not implemented
Source: GAO analysis of Federal Student Aid and PPO project documentation. | GAO-23-105333

- **Plan scope management – partially implemented.** Consistent with best practices, the PPO project management and requirements management plans defined a general process for scope management. According to these plans, the contractor should align its system development and delivery methodology with the FSA *Lifecycle Management Methodology*.[32] The development and delivery lifecycle

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[31]The Project Scope Management knowledge area in the PMBOK® Guide also identified best practices (i.e., processes) related to defining the project scope and creating a work breakdown structure. However, as discussed earlier, we excluded those two processes because they are addressed in our other objectives.

[32]Federal Student Aid, *Lifecycle Management Methodology*, version 2.2 (Mar. 9, 2021). The Lifecycle Management Methodology is FSA's IT project delivery and governance methodology. The methodology's approach to system delivery consists of eight stages and may include reviews at the end of each stage, when appropriate. The stages include: Initiative Vision, Requirements, Design, Development, Testing, Implementation, Operations and Maintenance, and Retirement. Depending on the size, scope and complexity of the project, some stages may be conducted iteratively, conducted in parallel, and/or combined for efficiency.

included nine stages: (1) release planning, (2) requirements gathering, (3) functional design, (4) detailed design, (5) build, (6) testing, (7) security, (8) implementation planning, and (9) implementation.[33]

Stages one and two establish the baseline requirements while stages three and four focus on further refining the scope. In addition, stages five, six, and seven validate the scope and account for ongoing changes in the scope baseline. Stages eight and nine deliver the functionality, as defined in the baseline requirements, to PPO users.

However, contrary to best practices, the project did not fully define how it intended to validate and control the baseline requirements. In particular, PPO did not define metrics for tracking the development delivery of the baseline requirements.

According to the PPO project manager, the project was not tracking metrics related to the scope baseline because the project did not include such a requirement in the PPO system development contract. However, as previously mentioned, the project has experienced schedule delays due to scope complexities. Therefore, until the project defines metrics for tracking the baseline requirements, it risks not monitoring deviations in scope over time and missed opportunities to take corrective actions when necessary.

- **Collect requirements – partially implemented**. The PPO project created a requirements definition document for each of the 10 features for release 1.0 that was approved by stakeholders on January 5, 2021.[34] Each document identified the assumptions, high-level requirements, and detailed requirements for that feature.

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[33]The PPO project is intended to be comprised of three large segments (which project officials refer to as milestones). For milestone one, the project is intended to develop and deliver functionality in both major (e.g., 1.0) and minor (e.g., 1.1) releases. A major release is defined as a significant change or addition to the functionality or technical characteristics of the PPO portal. A minor release represents updates to an existing system consisting of bug fixes, changes to static content, patches, or any combination thereof. The project intended to deliver the first milestone in three major releases, release 1.0, release 2.0, and release 3.0, with intermittent minor releases. As of June 2022, the project delivered one major release, 1.0, and six minor releases, 1.1 through 1.6.

[34]A feature is an attribute of a component or system specified or implied by requirements documentation (e.g., reliability, usability, or design constraints). For example, School Search and Profile was one feature developed in release 1.0. The goals of the School Search and Profile feature are to provide the ability to search for schools and view information.

However, neither the requirements definition documents nor other requirements documentation described how detailed requirements or features met the high-level business needs for the project.

While PPO project officials stated that they defined high-level strategic objectives that could be mapped to PPO requirements and features, the project officials did not demonstrate having performed such mapping. One of the key benefits of performing such a mapping is to avoid completing unnecessary work. This is especially important to the PPO project since it experienced delays due to subject matter experts having excessive workloads. Without documenting how detailed requirements meet the business need for the project, PPO risks dedicating resources to unnecessary work and building a system that does not meet all of its intended goals.

- **Validate scope – partially implemented.** The PPO project demonstrated the formal acceptance of portions of the release 2.0 requirements.[35] Specifically, the systems development contractor provided a first part of the release 2.0 requirements package on March 19, 2021, and the second part on August 9, 2021. Both packages included a performance report which discussed the release status, deliverable status, and associated risks. The PPO contracting officer subsequently accepted these packages on March 29, 2021, and August 25, 2021, respectively.

  However, PPO project officials did not demonstrate comparing the actual results to the requirements baseline and validating the delivery of the detailed requirements as intended. Specifically, the requirements packages accepted by the contracting officer established the requirements baseline, but not the delivery and testing of that baseline. According to the PPO project manager, project officials relied on the contractor's weekly project management reports to assess system development progress relative to the baseline. Project officials then relied on the results of testing activities to validate each requirement. However, the weekly project management reports did not track progress in relation to the requirements baseline.

  Further, the project did not demonstrate updating the requirements traceability matrices to capture the results of testing and method of

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[35]We reviewed the delivery and acceptance of a sample of contractor deliverables, including the release 2.0 requirements. We focused on release 2.0 because the project was actively developing this release during our review while release 1.0 had already been completed.

validation. According to the PPO project manager, project officials were working under the assumption that the same method of validation was used for every test script. The project manager acknowledged that this assumption was not documented.

The project manager intends to improve these matrices following the delivery of release 2.0, which is estimated to be spring 2023. This corrective action by the project to update the process will help to ensure that the project delivers functionality that meets the needs of FSA.

- **Control scope – partially implemented**. The PPO project adhered to FSA guidelines for change management.[36] According to the PPO project management plan, the Client Service Delivery team was responsible for managing the change management process and, among other things, logging the proposed scope changes and reviewing the scope change impact.

  In applying the FSA guidelines, PPO project officials maintained a log that captured the status of each change request. Each change request documented, among other things, an anticipated implementation date and rationale for the change. Project officials also maintained a log for each change in the requirements definition document, to summarize general changes made over time.

  However, the PPO project did not capture work performance data and information to identify scope variances and their causes, as the best practices specify. Specifically, as previously mentioned, weekly, monthly, and quarterly performance reports did not monitor progress in delivering the requirements as defined in the project's requirements definition document.

  Project officials stated that they did not monitor and report on progress in delivering the requirements because there was not a one-to-one correlation between a change request and a revision made to the associated requirement. Until the project captures work performance data and information to identify scope variances and their causes, it risks not anticipating when corrective actions are necessary and further delays in the project schedule.

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[36]Federal Student Aid, *Enterprise Change Management Plan*, version 4.2 (Sept. 23, 2021).

The PPO Project Partially Implemented Quality Management Practices

The PMBOK® Guide states that the purpose of implementing quality management practices is to implement processes for planning, managing, and controlling project and system quality requirements in order to meet stakeholders' objectives. The PMBOK® Guide includes the following three best practices for quality management: plan quality, manage quality, and control quality as they relate to system development.

The PPO project partially implemented these three practices. Table 10 describes these best practices and provides our assessment of the PPO project's implementation of the practices.

Table 10: Summary of the Partner Participation and Oversight (PPO) Project's Implementation of the Three Quality Management Practices

Best practice	GAO rating
Plan system development quality management by identifying quality requirements and/or standards for the project and its deliverables, and document how the project will demonstrate compliance with quality requirements and/ or standards, including identifying measurable project objectives and success criteria.	Partially implemented
Manage quality by translating the quality management plan into executable quality activities that incorporate the organization's system development quality-related policies into the project and update plans, as needed, to account for actual results.	Partially implemented
Control quality by monitoring and recording the results of executing the system development quality management activities to assess performance and ensure the project outputs are complete, correct, and meet customer expectations, including capturing the status of the quality metrics in work performance information and ensuring that the contractor deliverables meet the contract's criteria prior to acceptance.	Partially implemented

Legend: ●=Fully implemented ◑=Partially implemented ○=Not implemented

Source: GAO analysis of Federal Student Aid and PPO project documentation. | GAO-23-105333

- **Plan quality management – partially implemented**. The PPO project charter defined four project outcomes. Specifically, the project intended to: (1) modernize technology, (2) proactively monitor partner health, (e.g., a school's ability to manage its finances to avoid closure), (3) improve student outcomes, and (4) empower partners. The charter stated that PPO would establish service level agreement metrics, key performance indicators, and expected levels of performance for each outcome. According to the project management plan, these quality metrics should be captured and monitored to evaluate the effectiveness of meeting the project outcomes. In addition, in May 2020, the PPO project developed a performance metrics plan that defined nine key performance indicators.

  However, the project did not identify criteria that could be used to determine if the PPO project is achieving its goals (referred to as

success criteria). Specifically, while the key performance indicators focused on performance elements, such as the availability of the PPO website or the timeliness of contractor deliverables, the indicators did not focus on how FSA can determine if the project is successful and achieving the four PPO project objectives. For example, the PPO project did not define a key performance indicator to determine if the project was improving student outcomes.

The project manager explained that success criteria were not defined due to staffing limitations. The project manager added that the project is in the process of hiring a data analyst who will, among other things, begin the process of defining success criteria. However, the PPO project manager did not know when these would be defined. Without identifying success criteria, PPO cannot ensure it is developing a system that meets FSA's needs.

- **Manage quality – partially implemented.** The quality management section of the PPO project management plan defined the intended activities that were to be carried out by the project to ensure that a high-quality system was being developed and implemented. For example, the project plan stated that PPO was to manage quality through project management processes, such as issue and risk management. The project was also expected to conduct routine contractor performance evaluations and rely on FSA's end of stage assessments, referred to as stage gate reviews (e.g., Production Readiness Review) to assess and ensure the system quality.[37]

  However, the project did not update the quality section of the project management plan, or related planning documents, to account for actual project results. Specifically, in March 2021, the project completed a lessons learned survey and identified issues and areas for improvement based on the release 1.0 testing process. For example, the project encountered incomplete test scripts, which

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[37]The Production Readiness Review is a quality review of system releases and infrastructure changes before each release is implemented in FSA's production environment. The process is intended to keep FSA management informed of critical release activities and is intended to reduce the likelihood of system releases causing unintended adverse impact to FSA's business or end users. The Production Readiness Review serves as an end of stage review between the testing and implementation stages, as described in FSA's Lifecycle Management Methodology. There are several key activities that must be completed prior to the review, including the completion of all test phases.

required project officials to update the test scripts during user acceptance testing.[38]

To address this issue, the results from the lessons learned survey recommended delaying user acceptance testing until test scripts were fully reviewed. This recommended process would include requiring the contractor to check the quality of test scripts before sending them to FSA. Moreover, the project management office would need to account for time in the schedule to review and provide feedback on the scripts prior to the start of user acceptance testing. Despite identifying testing issues, the PPO project did not update the quality management section of the PPO project management plan to incorporate the recommended improvements.

PPO project officials stated the reason they did not update the project management plan with these recommended improvements was because the project team only updates this document when a critical change is identified, and they did not consider these improvements to be critical. Officials added that the project team tracks potential updates to project documentation that may be addressed later.

However, the project management plan is key to effectively planning for quality management activities and gaps in the plan can introduce risk to the proper execution of system development quality management activities. Until the PPO project updates the quality management section of its program management plan to account for actual project results, it risks facing the same challenges in future work and degrading the quality of the system.

In addition to the quality management plan, best practices also indicate that projects should develop executable quality activities that incorporate the organization's quality-related policies into the project. We found that PPO project officials incorporated FSA standards for

[38]User acceptance test scripts are part of the test preparation package that the contractor is required to deliver to FSA for formal acceptance.

some types of system development quality activities.[39] Specifically, the project incorporated FSA standards for system and user acceptance testing.

However, the project did not develop executable quality activities that incorporated other FSA standards. Specifically, the project did not incorporate FSA standards for unit and integration testing or post implementation verification.[40] For example, while FSA standards require the project manager to approve the unit test plan, which includes unit test metrics such as code coverage,[41] the PPO project did not develop a unit test plan that included metrics for code coverage.

According to PPO project officials, they believed the FSA standards were intended to be optional guidelines and that compliance was not required. However, contrary to the officials' belief, FSA's policy referred to the standards as requirements that were developed to bring consistency to projects' testing practices across FSA. Specifically, the FSA policy stated that the standards were the minimum required to meet FSA testing requirements.

As such, until the project develops executable system development quality management activities, including unit testing, that incorporate all of FSA's quality policies into the project, it risks a lack of structure,

[39]Federal Student Aid, *Enterprise Test Management Standards*, version 5.04 (Oct. 21, 2020). This standards document sets forth policies and standards for all aspects and phases of testing, as well as the creation of the ensuing test artifacts. This standards document contains FSA's testing requirements. According to this standards document there are five testing phases required by FSA: (1) Unit Testing, (2) Integration Testing, (3) System Testing, (4) User Acceptance Testing, and (5) Post Implementation Verification. The first four phases occur during new application development and maintenance and occur sequentially.

[40]During unit testing, developers design and perform tests to ensure that the code written performs according to the design. There are two types of unit testing: (1) component testing, and (2) unit integration testing. Component testing focuses on individual components of code and is always required. Unit integration testing occurs when developers combine components, testing the functionality of several components together.

[41]The Code Coverage metrics shows the results of statement coverage, condition coverage, and path coverage. Required code coverage metrics include, but are not limited to: (1) Total Number of Lines in the Code, (2) Total Number of Lines Unit Tested, (3) Total Number of Conditions in the Code, (4) Total Number of Conditions Unit Tested, (5) Total Number of Test Paths in the Code, and (6) Total Number of Paths Unit Tested.

consistency, repeatability, and continuous process improvement in quality management.

- **Control quality – partially implemented.** In March 2021, the PPO project conducted a Production Readiness Review of release 1.0 to assess the results of quality control activities such as the status of project risks and testing. As part of this review, PPO project officials and the stakeholders reviewed the system and user acceptance test results along with the status of any defects.[42] The PPO project also relied on weekly and quarterly contractor performance reports to monitor system development quality.

  However, the PPO project did not initially demonstrate that it captured the status of the quality metrics in work performance information. Specifically, the project did not demonstrate assessing performance relative to the key performance indicators. For example, one key performance indicator was that the project closed all problem tickets within two release cycles; however, the project did not monitor if this key performance indicator was met.

  In April 2022, project officials stated they were in the process of working with the contractor to develop a formal quarterly PPO key performance indicator report. Project officials stated that they intend to start receiving this report in July 2022. As such, this corrective action by the project to monitor the status of the quality metrics in its future work performance information will reduce risks related to the project making uninformed or untimely decisions that impact system quality.

  In addition to capturing the status of quality metrics, best practices also indicate that projects should ensure that contractor deliverables meet the contract's criteria prior to acceptance. We found that the PPO contract's performance work statement defined acceptance criteria for contractor deliverables. For example, as part of the test preparation package, the contractor was required to deliver requirements traceability matrices. The contract's performance work statement stipulated that these matrices should be created during the first release and updated on a 6 month cycle. Moreover, the matrices

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[42]System testing evaluates the integrated system (e.g., application) as a whole. The testing team performs tests to ensure that each function of the system works as expected and that any errors are documented, analyzed, and resolved appropriately.

must demonstrate that all requirements were mapped to completed test cases.

However, the project did not demonstrate that the contractor deliverables met these criteria laid out in the contract prior to FSA program officials accepting the deliverables. Subsequently, the March 2021 lessons learned survey for PPO identified a concern related to incomplete and error prone test scripts for user acceptance testing. These errors required additional work and delays in the testing phase of the project.

In response, project officials made two recommendations to address the lessons learned: (1) have the contractor institute quality checks by sending test scripts to FSA for review prior to user acceptance testing and (2) account for time in the schedule to review and provide feedback on the scripts prior to the start of user acceptance testing. According to the PPO project officials, both recommendations were implemented for release 2.0. However, the officials did not provide the supporting documentation to validate their assertion. In addition, project officials acknowledged that they did not update the test plan to explicitly state the changes associated with the test script review process.

Until the PPO project determines that deliverables meet the terms of the contract prior to acceptance, it risks accepting and paying for code from the contractor that does not meet quality standards and requires additional funding for future enhancement and maintenance fixes.

The PPO Project Partially Implemented Stakeholder Management Practices

According to the PMBOK® Guide, the purpose of implementing stakeholder management practices is to ensure that the project has appropriately identified all of the entities that could impact or be impacted by the project. Further, the practices help ensure that appropriate management strategies have been developed for effectively engaging stakeholders in project decisions and execution. The PMBOK® Guide, includes the following four best practices for effective stakeholder management: identify project stakeholders, plan stakeholder engagement, manage stakeholder engagement, and monitor stakeholder engagement.

The PPO project partially implemented these four stakeholder management practices. Table 11 describes these best practices and provides our assessment of the PPO project's implementation of the practices.

Table 11: Summary of the Partner Participation and Oversight (PPO) Project's Implementation of the Four Stakeholder Management Practices

Best practice	GAO rating
Identify project stakeholders through a register and regularly analyze and document relevant identification information or details around the level of engagement for each stakeholder.	Partially implemented
Plan stakeholder engagement by defining approaches to involve project stakeholders, including developing a stakeholder engagement plan to identify specific strategies or approaches for engaging with stakeholder individuals or groups.	Partially implemented
Manage stakeholder engagement by communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder engagement involvement, including updating the stakeholder engagement plan to reflect new or changed management strategies required to effectively engage stakeholders.	Partially implemented
Monitor stakeholder engagement and tailor strategies for engaging stakeholders through the modification of engagement strategies and plans, including tracking the actual level of stakeholder support and engagement relative to the desired level.	Partially implemented

Legend: ●=Fully implemented ◑=Partially implemented ○=Not implemented

Source: GAO analysis of Federal Student Aid and PPO project documentation. | GAO-23-105333

- **Identify project stakeholders – partially implemented.** The PPO project developed and maintained a list of stakeholder subject matter experts. This list identified the stakeholder name, group, and relevant system features.

  However, the project did not develop and maintain a stakeholder register that includes identification information or details around the level of engagement for each stakeholder. Specifically, the Next Gen program office's program management plan recommended that the project develop a stakeholder register that captures information about the stakeholders such as, role, influence on the program/project, interest, requirements they want from the project, and dependencies between the project and stakeholder. However, the PPO project's stakeholder list did not capture much of this key information. The list excluded the stakeholder organizational position, role on the project, expectations, potential for influencing project outcomes, and the phase of the project lifecycle where the stakeholder has the most influence or impact.

  Project officials were unable to provide a reason for why they had not documented key stakeholder information. However, PPO officials reported in the project's issue tracker that there was a lack of

engagement from stakeholders. As a result, until the project develops and maintains a stakeholder register that includes identification information or details around the level of engagement for each stakeholder, it cannot ensure stakeholders involvement will be properly utilized and managed.

- **Plan stakeholder engagement – partially implemented.** In support of release 1.0, the PPO project performed a stakeholder analysis and documented its planned approach to engage and involve the stakeholders based on their level of interest and level of influence. The stakeholder analysis also considered how often to engage with stakeholders. Based upon the results of the stakeholder analysis, the project developed a release 1.0 communications plan and separate training plan that defined efforts to engage stakeholders later in the development lifecycle as the project was approaching deployment of system functionality.

  However, the project did not define specific strategies for engaging with stakeholders earlier in the development lifecycle. For example, the 1.0 communications plan and training plan did not discuss how or when PPO intended to communicate and engage with stakeholders when preparing the requirements definition documents or conducting user acceptance testing. Project officials were unable to provide a reason for why they had not documented when they planned to engage with the stakeholders regarding these key milestones.

  A related concern was identified in PPO's project issue tracker. Specifically, the project identified an issue related to limited transparency between the PPO project and other Next Gen projects. As part of that risk, the project officials acknowledged multiple potential impacts to PPO, including unclear dependencies between the projects, missed opportunities to utilize existing contract proposals, and additional costs related to systems integration.

  Project officials stated that although they lacked specific stakeholder management documentation, they communicated frequently and consistently with stakeholders. However, the officials did not provide documentation supporting this assertion.

  Until the PPO project defines specific strategies for engaging with stakeholders, it risks limited stakeholder involvement and overlooking stakeholder needs, expectations, interests, and potential impact on the project.

- **Manage stakeholder engagement – partially implemented.** The March 2021 lessons learned survey for PPO identified issues and areas for improvement based on release 1.0 stakeholder management. For example, project officials identified that early internal communications between the project team and other internal stakeholders was lacking.

  To address this issue, PPO project officials recommended identifying key internal stakeholders early on in the project plan to ensure that there were not any missed opportunities to inform them and to sustain communication throughout the project.

  However, the PPO project did not update the stakeholder engagement plan to reflect incorporating this recommendation. The PPO project manager stated the reason they did not update the approach to stakeholder engagement with this recommendation was because the project team only updated the stakeholder engagement plan when a critical change was identified, and they did not consider these improvements to be critical. The project manager added that the team tracks potential updates to project documentation that may be addressed later.

  Until the PPO project updates the stakeholder engagement plan to reflect enhanced management strategies required to effectively engage stakeholders, the project will continue to lack assurance that they are effectively engaging and communicating with its stakeholders.

- **Monitor stakeholder engagement – partially implemented.** The PPO project monitored the activities and progress of the strategic engagement project team as part of routine meetings. This team focused on developing and executing the activities defined in the communications plan and training plan. As previously discussed, these plans focused on stakeholder activities later in the development lifecycle as the project approached deployment of system functionality.

  However, as previously discussed, the project did not define specific strategies for engaging with stakeholders earlier in the development lifecycle. As a result, the project did not demonstrate tracking stakeholder support and engagement earlier in the project lifecycle, such as during requirements gathering or testing. While project officials stated that they tracked and reported on actual stakeholder engagement, reporting only included a general discussion of the

preparation for and development of training materials. The reports did not discuss the level of stakeholder involvement in requirements gathering or other project lifecycle activities.

In addition, as of May 2022, PPO's risk register identified an issue regarding the availability of subject matter experts. As part of that risk, the project acknowledged multiple potential impacts to the project, including the increased likelihood for gaps in requirements, unclear requirements, and delays in development activities. In January 2022, the PPO project manager stated that delays for release 2.0 were the result of greater scope complexity than initially planned and specific FSA resources (including subject matter experts) being unavailable when needed.

Until the project tracks the actual level of stakeholder support and engagement relative to the desired level during all phases of the project lifecycle, it risks not effectively monitoring stakeholder relationships and appropriately tailoring strategies for engaging its stakeholders.

Conclusions

FSA's mixed progress in implementing the nine projects that currently comprise the Next Gen program resulted in the completion of five projects—two of which deployed a system. The four remaining projects each experienced schedule delays with interim milestones. Further exacerbating the schedule delays is the fact that officials do not know when they would fully implement three of the four remaining projects. This directly affects FSA's ability to retire two legacy systems. Finally, although FSA reported that it had spent at least $502 million on all Next Gen projects, it did not include government-related labor costs associated with the program. Until it implements processes for accurately tracking and monitoring costs associated with the program, including government-related labor costs, FSA management officials will lack a full understanding of the program's costs.

FSA's schedule and cost shortcomings reflect its lack of alignment with GAO best practices. Specifically, FSA's ability to have an accurate account of Next Gen spending is further limited due to the office's cost estimation development guidance lacking steps for developing reliable cost estimates. In the absence of such guidance, it is likely that the department is developing cost estimates for its acquisition programs that

are of poor quality. As a consequence, the Next Gen program's cost estimate of $415 million did not substantially or fully meet the attributes for any of the four characteristics of a reliable cost estimate. The program's schedule estimate also did not substantially or fully meet the attributes for any of the four characteristics of a reliable schedule. Until the significant weaknesses in the cost and schedule estimates are addressed, the office risks being unable to effectively estimate future funding needs for the Next Gen program and may face additional delays as it implements the program's remaining projects. In addition, senior leadership's ability to make informed decisions on the program's future will continue to be impaired.

Moreover, the PPO project partially implemented each of the 11 practices we reviewed associated with scope management, system development quality management, and stakeholder management. Until the PPO project fully implements the 11 best practices, its efforts to successfully develop the remaining functionality of this important system are at risk of additional delays, cost increases, and system capabilities that do not meet schools' needs.

Recommendations for Executive Action

We are making the following 14 recommendations to Education's FSA:

The Chief Operating Officer of FSA should ensure that, moving forward, the Next Gen program tracks and monitors all of its costs, including government labor costs. (Recommendation 1)

The Chief Operating Officer of FSA should update FSA's cost estimation guidance for its acquisition programs to incorporate the best practices called for in GAO *Cost Estimating and Assessment Guide*. (Recommendation 2)

The Chief Operating Officer of FSA should update the cost estimate for the Next Gen program to ensure it accounts for all costs and incorporates the best practices called for in GAO *Cost Estimating and Assessment Guide*. (Recommendation 3)

The Chief Operating Officer of FSA should revise the schedule estimate for the Next Gen FSA program to incorporate the best practices called for in GAO Schedule Assessment Guide. (Recommendation 4)

The Chief Operating Officer of FSA should ensure that the PPO project defines metrics for tracking the baseline requirements and the rationale for using the metrics. (Recommendation 5)

The Chief Operating Officer of FSA should ensure that the PPO project documents how detailed requirements meet the business need for the project. (Recommendation 6)

The Chief Operating Officer of FSA should ensure that the PPO project captures work performance data and information to identify scope variances and their causes. (Recommendation 7)

The Chief Operating Officer of FSA should ensure that the PPO project identifies success criteria and measurable project objectives. (Recommendation 8)

The Chief Operating Officer of FSA should ensure that the PPO project updates the quality management section of its project management plan, and other related quality management documentation, to account for actual project results. (Recommendation 9)

The Chief Operating Officer of FSA should ensure that the PPO project develops executable quality activities that incorporate FSA's quality policies into the project. (Recommendation 10)

The Chief Operating Officer of FSA should ensure that the PPO project determines that contractor deliverables meet the terms of the contract prior to acceptance. (Recommendation 11)

The Chief Operating Officer of FSA should ensure that the PPO project develops and maintains a stakeholder register that includes identification information or specifics around the level of engagement for each stakeholder. (Recommendation 12)

The Chief Operating Officer of FSA should ensure that the PPO project defines specific strategies for engaging with stakeholders and updates its stakeholder engagement plan to reflect new or changed management strategies required to effectively engage stakeholders. (Recommendation 13)

The Chief Operating Officer of FSA should ensure that the PPO project monitors work performance information that reflects the actual level of

stakeholder support and engagement relative to the desired level during all phases of the project lifecycle. (Recommendation 14)

Agency Comments and Our Evaluation

We provided a draft of this report to Education for review and comment. FSA, on behalf of Education, provided written comments, which are reprinted in appendix II. In its comments, FSA stated that it generally concurred with our recommendations, with some further considerations. Specifically, FSA stated that the Chief Operating Officer directed the senior leadership team to establish a working group to identify potential improvements to the office's project management guidance and practices based on the helpful recommendations contained in our report.

FSA also provided general comments in response to the best practices and findings in the report. Specifically, FSA stated that we relied on our own best practices, rather than a standard of legal compliance. In consultation with our Office of the General Counsel, we did not identify any specific legal criteria that would have been relevant for this review.

Accordingly, we assessed the Next Gen program against widely accepted best practices. Specifically, we assessed the reliability of Next Gen's cost and schedule estimates against our cost and schedule assessment guides. These guides are compilations of best practices that federal cost and scheduling estimating organizations, the public sector, and industry use to develop and maintain reliable estimates throughout the life of a government program. The ability to generate reliable cost and schedule estimates is a critical function for all federal agencies.

In addition, we assessed the PPO project against selected practices from the PMBOK® Guide because the guide represents standards that are used worldwide to provide guidance on how to manage various aspects of projects, programs, and portfolios. In addition, Next Gen's program management plan states that the program follows PMBOK®.

FSA also stated in its written comments that many of our findings, such as those pertaining to the cost estimate, were based on requirements and information from when the Next Gen program was first developed. FSA added that the requirements and implementation time frames for the Next Gen program have been adjusted as implementation has proceeded, causing the government to realize additional costs.

However, our assessments were based on the most recent planning documents and performance data that were made available to us during our review. For example, while the program started in 2017, we assessed the September 2021 lifecycle cost estimate, which was the most recent estimate available at the time that we conducted our assessment. We agree that the program has experienced changes, thus underscoring the need to update key management documents, such as the lifecycle cost estimate, and to implement our recommendations.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Education, and other interested parties. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-5017 or cruzcainm@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

Marisol Cruz Cain
Director, Information Technology and Cybersecurity

Appendix I: Objectives, Scope, and Methodology

Our objectives were to (1) determine the status of the Federal Student Aid's (FSA) Next Gen program, (2) evaluate the extent to which FSA cost estimation guidance and the FSA Next Gen program's cost and schedule estimates aligned with GAO's cost and schedule best practices, and (3) evaluate the extent to which the Next Gen program was implementing best IT practices related to scope, quality, and stakeholder management for the Partner Participation and Oversight (PPO) project.

To address the first objective, we reviewed Next Gen planning documentation, such as program- and project-level management plans and project-level charters, to describe the cost, schedule, and scope changes that Next Gen has experienced since it was initiated. We also reviewed relevant documentation to describe FSA's original and current plans for retiring related legacy systems following the implementation of the Next Gen program's IT systems and applications.

To assess the reliability of the office-reported cost and schedule data provided for the Next Gen program, we interviewed knowledgeable program office officials to clarify questions related to the data, including FSA's controls for ensuring the reliability of the cost and schedule data. We also reviewed the cost and schedule data to identify missing or incorrect data and followed up with the appropriate Next Gen officials, as needed. Regarding actual cost data, we determined that the data provided by FSA and Next Gen program officials were not complete and reliable. Specifically, the data were incomplete because they did not include information related to all government-related costs. We noted in our report the limitations of the cost data when describing the status of the program's modernization effort.

To address the first part of our second objective, we assessed FSA's policies and procedures to determine the extent to which its lifecycle cost

estimate guidance[1] met the 12 steps in the cost estimating development process, as established by GAO's *Cost Estimating and Assessment Guide*.[2] In particular, we compared the methods outlined in FSA's guidance, such as FSA's annual planning budget estimation guidance, investment review management stage gate guidance, and independent government cost estimate guide, among others, to the 12 steps for cost estimating outlined in the GAO *Cost Estimating and Assessment Guide*. We conducted this in-depth analysis on FSA's cost estimation guidance because it was important to understand if the guidance that programs were expected to use was sufficient.

To address the second part of our second objective, we reviewed the Next Gen program's cost and schedule estimates, dated September 2021 and December 2021, respectively, and related documents describing Next Gen's cost and schedule estimation practices.[3]

- To assess Next Gen's September 2021 cost estimate, we evaluated documentation supporting the estimate, such as the annual budget initiative request data that supported the program's cost estimate and the program's budget and cost management plan. We assessed this documentation against the comprehensive, accurate, well-documented, and credible characteristics of a reliable cost estimate, as identified in GAO's *Cost Estimating and Assessment Guide*. To understand Next Gen's methodology, data, and approach, we interviewed relevant program officials, including the Next Gen program manager. We noted in our report the instances where cost estimation data was unreliable.

- To assess Next Gen's December 2021 schedule, we evaluated documentation supporting the schedules, such as the integrated master schedule, schedule risk analysis, and a schedule management plan. We assessed the schedule documentation against best practices for developing a comprehensive, well-constructed, credible, and controlled schedule, as identified in GAO's *Schedule Assessment Guide*. We also interviewed program officials responsible for

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[1]The guidance documents we reviewed included FSA's lifecycle management methodology, management stage gate review standard operating procedures, annual planning budget estimation guidance, budget initiative request guidance, and independent government cost estimate guide, among other things.

[2]GAO, *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Program Costs,* GAO-20-195G (Washington, D.C.: Mar. 12, 2020).

[3]With regard to the schedule estimate, we originally reviewed the December 2021 estimate.

developing and managing the program schedule, including Next Gen's Master Scheduler, to understand the practices for creating and maintaining the schedule. We noted in our report the instances where the schedule data was unreliable.

For our assessments related to FSA's cost estimation guidance and the Next Gen program's cost and schedule estimates, we applied the standard rating scale used in GAO cost and schedule evaluations. Specifically, we assessed each best practice as:

- met—FSA provided complete evidence that satisfies all the criteria;

- substantially met—FSA provided evidence that satisfies more than half of the criteria, but not all the criteria;

- partially met—FSA provided evidence that satisfies about half of the criteria;

- minimally met—FSA provided evidence that satisfies less than half of the criteria; and

- not met—FSA did not provide evidence that satisfies any of the criteria.

Finally, we provided FSA and Next Gen program officials with draft versions of our detailed analyses of FSA's cost estimation guidance and the Next Gen program's cost estimate and schedules. This was done to verify that the information on which we based our findings was complete, accurate, and up-to-date.

To address the third objective, we conducted a detailed review of the program's PPO project, which is one of the most critical and expensive projects within the Next Gen program.[4] Specifically, we assessed the PPO project against selected best practices outlined in the Project

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[4]Based on the Next Gen program and project data provided by FSA, we focused this objective on PPO because it had one of the highest planned total life-cycle costs through fiscal 2023.

Management Institute's *A Guide to the Project Management Body of Knowledge* (PMBOK® Guide).[5]

To select the PMBOK® Guide practices to assess PPO against, we first analyzed the 10 knowledge areas[6] within the PMBOK® Guide and excluded the cost and schedule knowledge areas because they identified processes that would be addressed by our second objective. This reduced the list of knowledge areas for consideration to eight.

Next, we selected the knowledge areas that we determined were especially important to the success of the PPO project. As such, we selected the three following knowledge areas as our criteria: (1) project scope management, (2) system development quality management, and (3) project stakeholder management. Collectively, these three knowledge areas identified a total of 13 processes that describe, among other things, the types of inputs and outputs that are associated with each process.

From these 13 processes, we excluded two processes within the project scope management practice (i.e., the Define Scope and Create Work Breakdown Structure processes) because they would be addressed through our other two objectives. Table 12 identifies the three selected project management knowledge areas and 11 selected associated practices.

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[5]Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge*, 6th ed. (2017). PMBOK is a trademark of Project Management Institute, Inc. The Project Management Institute, Inc., founded in 1969, is a not-for-profit association that provides global standards for project management. These standards are utilized worldwide and provide guidance on how to manage various aspects of projects, programs, and portfolios. The PMBOK® Guide is the Project Management Institute's flagship publication that includes standards for effective project management.

[6]A knowledge area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques. The 10 knowledge areas within the PMBOK® Guide are: (1) Project Integration Management, (2) Project Scope Management, (3)Project Schedule Management, (4) Project Cost Management, (5) Project Quality Management, (6) Project Resource Management, (7) Project Communications Management, (8) Project Risk Management, (9) Project Procurement Management, and (10) Project Stakeholder Management.

Table 12: Selected Project Management Knowledge Areas and Selected Associated Practices

Knowledge area	Selected practice
Scope management	Plan scope management by creating a project management plan that documents how the project's baseline requirements will be defined, validated, and controlled, including a requirements management plan that documents metrics that will be used to track the baseline requirements.
	Collect requirements by determining, documenting, and managing stakeholder needs and requirements to meet project objectives, including how detailed requirements meet the business need for the project and developing and routinely updating a requirements traceability matrix that fully traces requirements to all associated test scenarios.
	Validate scope by formalizing acceptance of the completed project deliverables, including comparing the actual results to the requirements baseline to determine if a change, corrective action, or preventative action is necessary and updating the requirements traceability matrix to capture the results and method of validation.
	Control scope by monitoring the status of the project and system scope and managing changes to the requirements baseline, including capturing work performance data and information to identify scope variances and their causes.
Quality management	Plan quality management by identifying quality requirements and/or standards for the project and its deliverables, and document how the project will demonstrate compliance with quality requirements and/or standards, including identifying measurable project objectives and success criteria.
	Manage quality by translating the quality management plan into executable quality activities that incorporate the organization's quality-related policies into the project and update plans, as needed, to account for actual results.
	Control quality by monitoring and recording the results of executing the quality management activities to assess performance and ensure the project outputs are complete, correct, and meet customer expectations, including capturing the status of the quality metrics in work performance information and ensuring that the contractor deliverables meet the contract's criteria prior to acceptance.
Stakeholder management	Identify project stakeholders through a register and regularly analyze and document relevant identification information or details around the level of engagement for each stakeholder.
	Plan stakeholder engagement by defining approaches to involve project stakeholders, including developing a stakeholder engagement plan to identify specific strategies or approaches for engaging with stakeholder individuals or groups.
	Manage stakeholder engagement by communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder engagement involvement, including updating the stakeholder engagement plan to reflect new or changed management strategies required to effectively engage stakeholders.
	Monitor stakeholder engagement and tailor strategies for engaging stakeholders through the modification of engagement strategies and plans, including tracking the actual level of stakeholder support and engagement relative to the desired level.

Source: GAO analysis of the project management knowledge areas and process identified in the PMBOK® Guide. All rights reserved. Used with permission. | GAO-23-105333

To determine the extent to which the PPO project had implemented the selected best IT project management practices, we obtained and assessed program, scope, requirements, contract, and stakeholder management documentation and compared them against each of the selected practices. In particular, we analyzed the PPO's project management plan, project charter, requirements management plan, requirements traceability matrices, and requirements change request

documentation. Further, we analyzed the system development contract and associated contract modifications, performance work statements, contract deliverables, performance metrics plan, communications plan, stakeholder analysis documentation, and subject matter expert distribution lists specific to the PPO project.

We also interviewed Next Gen program office and PPO project officials, including the Next Gen program manager and PPO project manager, to obtain an understanding of the processes in place to manage the project. Further, we discussed with the officials the project's efforts to implement the selected practices.

Moreover, to determine whether the PPO project had reviewed selected contractor deliverables prior to approval, we first reviewed the most recent contract modification and associated performance work statement to identify the total list of deliverables that were associated with the PPO system development contract. The contract identified a total of 32 deliverables. Of these 32 deliverables, we selected a judgmental sample of three contract deliverables to review. Our decision to focus on only three deliverables was based on our available team resources. We then evaluated the selected contract deliverables to determine whether the PPO project team and contracting officials reviewed and approved these deliverables.

We assessed the PPO project's implementation of the 11 project management practices as:

- fully implemented, if available evidence demonstrated all aspects of the practice;
- partially implemented, if available evidence demonstrated some, but not all, aspects of the practice; and
- not implemented, if available evidence did not demonstrate any aspect of the practice.

We determined that the data used to support the findings in this report were sufficiently reliable for the purposes of our reporting objectives, with the exception of the office-reported cost and schedule data as discussed previously. We discuss the limitations of these data in the report. We have also made appropriate attribution indicating the sources of the data.

Lastly, we assessed the relevance of standards for internal controls for the audit. We determined that the control environment, risk assessment,

control activities, and information and communication components of internal control were significant to objectives two and three. Of specific relevance were internal control principles that emphasize that management should (1) establish an organizational structure, assign responsibility, and delegate authority to achieve the entity's objectives; (2) evaluate performance and hold individuals accountable for their internal control responsibilities; (3) identify, analyze, and respond to significant changes that could impact the internal control system; (4) design control activities to achieve objectives and respond to risks; (5) design the entity's information system and related control activities to achieve objectives and respond to risks; (6) implement control activities through policies; (7) use quality information to achieve the entity's objectives; (8) internally communicate the necessary quality information to achieve the entity's objectives; and (9) externally communicate the necessary quality information to achieve the entity's objectives. To assess these internal control components, we reviewed applicable policies and procedures and interviewed officials.

We conducted this performance audit from July 2021 to October 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Comments from the Department of Education

September 30, 2022

Marisol Cruz Cain
Director, Information Technology and Cybersecurity
Government Accountability Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Ms. Cruz Cain:

I write on behalf of the U.S. Department of Education (Department), office of Federal Student Aid (FSA) in response to the statements and recommendations made in the Government Accountability Office (GAO) draft report, "Information Technology: Education Needs to Address Student Aid Modernization Weaknesses" (GAO-23-105333). We appreciate the opportunity to respond to the draft report.

GAO's draft report reviews the project planning aspects of FSA's Next Gen program. The overriding goals of the Next Gen program are to modernize the systems and processes and improve experiences for students, borrowers, parents, schools, and other partners. Next Gen is a long-term program on a massive scale affecting every aspect of the federal student aid lifecycle.

As a program, Next Gen has improved the borrower and partner experience by creating seamless interactions throughout the lifecycle of Title IV student aid, creating a consistent experience under the FSA brand, and improving FSA's operational flexibility. Since 2019, the Aidan virtual assistant has provided 24/7 customer support and answered more than 13 million messages. StudentAid.gov and the 1-800 phone number have had over 530 million visits and more than nine million inbound calls respectively. Moreover, for the first time in FSA's history, parents, students, and borrowers can learn about and apply for their Title IV student aid through a single website. In 2021, the launch of Partner Connect established a single front door for FSA partner interactions and has since implemented more than 50 enhancements. In 2022, FSA completed the buildout of the Enterprise Data Management and Analytics Platform Services' (EDMAPS') Data Lake architecture, infrastructure, and reporting capabilities, which created a centralized data hub for storage and access to Title IV data.

Throughout these projects, cybersecurity has been woven into the framework of the system enhancements, allowing Next Gen solutions to have some of the highest cybersecurity scores among FSA systems. Digital Customer Care (DCC), National

Page 2 – Marisol Cruz Cain

Student Loan Data System (NSLDS), and EDMAPS cybersecurity scores are in the top five of the thirteen Department High Value Assets (HVA). Next Gen has not only achieved many of its goals, but it is also creating the framework for future programs and modernizing FSA systems.

During the COVID-19 pandemic, FSA maintained continuity of its operations and communicated quickly with borrowers. This included sending 2.8 million emails on a single day during the early stages of the pandemic redirecting students and borrowers to one source (StudentAid.gov) that provided current and critical guidance about pandemic relief as well as the student loan payment pause. This would not have been possible if FSA, through Next Gen, had not managed seamless transitions to new systems and consolidated six customer-facing websites to a single centralized StudentAid.gov website located on the DCC platform.

In its draft report, GAO evaluates the extraordinary and massive Next Gen effort based on best practices identified by GAO, rather than based on a standard of legal compliance. Much of the findings in the draft GAO report, such as the government's cost estimations, were based on the known requirements and information available at the time when Next Gen was first developed. As implementation proceeded, various strategies, requirements, and timelines were adjusted, causing the government to realize additional costs. While FSA appreciates and benefits from GAO identifying IT best practices in implementing Next Gen, FSA nonetheless operates under certain constraints and must consider how to optimize the terms of existing contracts, current staffing levels, contractor capabilities, and other available resources, including the funding levels provided by Congress.

FSA generally concurs with GAO's recommendations, with some further considerations. I have directed my senior leadership team to establish a working group to identify potential improvements to FSA's project management guidance and practices based on the helpful recommendations contained in this report. Through this group, we will more fully study the best practices outlined by GAO and determine how we can best take appropriate actions to conform to the guidance provided, as available resources permit.

Thank you for the opportunity to respond to the GAO draft report. FSA appreciates GAO's thoughtful work on this important issue.

Sincerely,

Richard Cordray
Chief Operating Officer
Federal Student Aid

Text of Appendix II: Comments from the Department of Education

September 30, 2022

Marisol Cruz Cain

Director, Information Technology and Cybersecurity Government Accountability Office

441 G Street, N.W. Washington, D.C. 20548

Dear Ms. Cruz Cain:

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cybersecurity scores among FSA systems. Digital Customer Care (DCC), National Student Loan Data System (NSLDS), and EDMAPS cybersecurity scores are in the top five of the thirteen Department High Value Assets (HVA). Next Gen has not only achieved many of its goals, but it is also creating the framework for future programs and modernizing FSA systems.

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Thank you for the opportunity to respond to the GAO draft report. FSA appreciates GAO's thoughtful work on this important issue.

Sincerely,

Richard Cordray

Chief Operating Officer Federal Student Aid

Appendix III: GAO Contacts and Staff Acknowledgments

GAO Contact

Marisol Cruz Cain, (202) 512-5017, cruzcainm@gao.gov

Staff Acknowledgments

In addition to the contacts listed above, the following staff made significant contributions to this report: Shannin O'Neill (assistant director), Javier Irizarry (analyst in charge), Mathew Bader, Chris Businsky, Juaná Collymore, Emile Ettedgui, Rebecca Eyler, Anna Irvine, Jennifer Leotta, Ahsan Nasar, Darron Smallwood, and Adam Vodraska.

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