May 2008

INFORMATION TECHNOLOGY

Agriculture Needs to Strengthen Management Practices for Stabilizing and Modernizing Its Farm Program Delivery Systems

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INFORMATION TECHNOLOGY

Agriculture Needs to Strengthen Management Practices for Stabilizing and Modernizing Its Farm Program Delivery Systems

Why GAO Did This Study

The U.S. Department of Agriculture (USDA) has experienced significant problems with its information technology systems that support the delivery of benefits programs to farmers. In October 2006, these systems began experiencing considerable delays while attempting to process a large number of transactions, and by January 2007, the systems became inoperable for 1 month. In response to these issues, USDA developed a near-term stabilization plan and long-term plans to modernize its delivery of these programs. GAO was asked to determine (1) the extent to which USDA's stabilization plan addresses key management issues, including consistently tracking reported problems, establishing performance metrics and goals, and defining roles and responsibilities and (2) the adequacy of USDA's assessment of existing product capabilities, as well as cost and schedule estimates for its new, long-term modernization investment. To address these objectives, GAO, among other things, compared USDA's plans with industry best practices. On March 25, 2008, GAO briefed the requesters' staff on the results of this review.

What GAO Recommends

GAO recommends that USDA develop specific plans to address management weaknesses and develop reliable cost and schedule estimates. USDA officials did not provide comments on a draft of this report; however, in commenting on the draft briefing, they generally agreed with the recommendations.

What GAO Found

USDA's near-term plan to stabilize the agency's farm program delivery systems focused on technical issues such as expanding telecommunication capacity and acquiring a means for disaster backup and recovery; however, it did not address key managerial issues such as the department's inconsistent tracking of users' reported problems with the system. Additionally, USDA did not have system performance goals or dedicated staff to analyze and use system performance data, and the stabilization plan did not address these issues. Moreover, the plan did not clearly define the roles and responsibilities for the organizations involved in the stabilization effort in order to ensure proper accountability. While department officials indicated that they planned to address system performance management issues in a future version of the stabilization plan, they did not yet have plans to enable USDA to consistently track users' reported problems and to clarify roles and responsibilities. As a result, USDA could not be assured that its stabilization efforts would enable the department to reliably deliver farm benefit programs to its customers.

Regarding USDA's proposed long-term investment known as MIDAS— Modernize and Innovate the Delivery of Agricultural Systems—officials had plans under way to obtain the necessary information for assessing the capability of products to integrate existing systems. However, business requirements were not used as a basis for the department's life-cycle cost estimate of $455 million for the modernization initiative. Instead, the estimate was based primarily on the cost estimate for another unrelated USDA IT investment. Similarly, the department had not adequately assessed its schedule estimate. According to department officials, they committed to accelerating the implementation of MIDAS from 10 years to 2 years in order to more quickly deliver a long-term solution to problems the department is experiencing with its existing program's delivery systems. However, business requirements were not considered when developing this schedule estimate. As a result, it was uncertain whether the department would be able to deliver the modernization initiative within the cost and schedule time frames it had proposed.

Contents

Abbreviations

AS/400	Application System/400
CRP	Conservation Reserve Program
DCP	Direct and Counter-Cyclical Program
e-LDP	Electronic Loan Deficiency Program
FSA	Farm Service Agency
IT	information technology
ITIL	Information Technology Infrastructure Library
ITS	Information Technology Services
MIDAS	Modernize and Innovate the Delivery of Agricultural Systems
NRCS	Natural Resources Conservation Service
OMB	Office of Management and Budget
RD	Rural Development
SEI	Software Engineering Institute
USDA	U.S. Department of Agriculture

United States Government Accountability Office
Washington, DC 20548

May 16, 2008

Congressional Requesters

The U.S. Department of Agriculture (USDA) recently experienced significant problems with its information technology (IT) systems that support the delivery of benefits programs to farmers (farm program delivery systems). In October 2006, these systems began experiencing considerable delays while attempting to process a large number of transactions, and by January 2007, the systems became inoperable for a period of 1 month. Among other things, this outage led to significant delays in USDA's delivery of benefits to farmers.

In response to these issues, USDA developed a near-term plan to stabilize its farm program delivery systems. USDA also has a long-term project to modernize its delivery of these programs. The project, which has been in the planning stage since 2004, is known as MIDAS—Modernize and Innovate the Delivery of Agricultural Systems—and is envisioned to be an entirely new farm program delivery system.

At your request, we reviewed USDA's efforts to stabilize and modernize its farm program delivery systems. Specifically, we (1) assessed the extent to which USDA's stabilization plan addresses key management issues, including consistently tracking reported problems, establishing performance metrics and goals, and defining roles and responsibilities; and (2) determined the adequacy of USDA's assessment of existing product capabilities, as well as cost and schedule estimates for its new, long-term modernization investment.

To address our first objective, we assessed USDA's near-term plans for stabilizing farm program delivery systems to identify the activities that the plan covers; analyzed system performance documentation, including an independent validation and verification report and other internal system performance assessments; compared the stabilization plan with key practices for managing information systems; and interviewed officials from USDA, the Farm Service Agency (FSA), the Natural Resources Conservation Service, Rural Development, and end users of the systems.

To address our second objective, we identified key practices and lessons learned from previous GAO reports and other guidance, such as the Software Engineering Institute's Capability Maturity Model Integration—

which encompasses defining requirements, assessing existing product capabilities, and preparing cost and schedule estimates. We also reviewed and analyzed FSA's business case, cost-benefit analysis, and an analysis of alternative implementation options for its modernization initiative. In addition to interviewing officials from USDA and FSA to discuss their approach to planning the development of MIDAS, we also interviewed officials from OMB to obtain their perspective on USDA's plans to modernize its program delivery systems.

We conducted this performance audit at USDA in Washington, D.C., and Kansas City, Missouri, and at the Office of Management and Budget in Washington, D.C., from May 2007 to May 2008 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.

This report summarizes the information we provided to your staff during our March 25, 2008, briefing. The full briefing, including our scope and methodology, can be found in appendix I.

In summary, our briefing made the following points:

- USDA's near-term plan to stabilize the agency's farm program delivery systems focused on technical issues, such as expanding telecommunications capacity and acquiring a means for disaster backup and recovery; however, it did not address key managerial issues, such as the department's inconsistent tracking of users' reported problems with the system. Additionally, USDA did not have system performance goals or dedicated staff to analyze and use system performance data, and the stabilization plan did not address these issues. Moreover, the plan did not clearly define the roles and responsibilities for the organizations involved in the stabilization effort in order to ensure proper accountability. While department officials indicated that they plan to address system performance management issues in a future version of the stabilization plan, they did not yet have plans to enable USDA to consistently track users' reported problems and to clarify roles and responsibilities. As a result, USDA could not be assured that its stabilization efforts would enable the department to reliably deliver farm benefit programs to its customers.

- Regarding USDA's proposed long-term investment in MIDAS, officials had plans under way to obtain the necessary information for assessing the capability of products to integrate existing systems. However, business requirements were not used as a basis for the department's life-cycle cost estimate of $455 million for the modernization initiative. Instead, the estimate was based primarily on the cost estimate for another unrelated USDA information technology investment. Similarly, the department had not adequately assessed its schedule estimate. According to department officials, they committed to accelerating the implementation of MIDAS from 10 years to 2 years in order to more quickly deliver a long-term solution to problems the department is experiencing with its existing program delivery systems. However, business requirements were not considered when developing this schedule estimate. As a result, it was uncertain whether the department would be able to deliver the modernization initiative within the cost and schedule time frames it had proposed.

Recommendations for Executive Action

We recommend that the Secretary of USDA direct the department's Chief Information Officer to work with FSA's Chief Information Officer to develop specific plans for consistently tracking users' reported problems and clearly defining roles and responsibilities for Information Technology Services and the Farm Service Agency.

We also recommend that the Secretary of USDA direct the department's chief information officer to work with FSA's chief information officer to fully assess USDA's investment in MIDAS, including

- establishing effective and reliable cost estimates using industry best practices, including using key information such as business requirements to develop the estimates; and

- establishing a realistic and reliable implementation schedule for MIDAS that is based on complete business requirements.

Agency Comments and Our Evaluation

We solicited comments from USDA officials on a draft of this report; however, the officials did not provide a response. We previously received comments on a draft of the briefing slides (see app. I) via e-mail, which represented the views of officials from FSA, USDA's Office of the Chief Information Officer, and USDA's Office of the Chief Financial Officer. These officials generally agreed with our findings, conclusions, and

recommendations. The department also provided technical comments that we incorporated into the briefing slides, as appropriate.

We are sending copies of this report to interested congressional committees and the Secretary of Agriculture. We will also make copies available to others on request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staffs have any questions about this report, please contact me at (202) 512-6240 or at koontzl@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix II.

Lynda D Koontz

Linda D. Koontz
Director, Information Management Issues

The Honorable Herb Kohl
Chairman
The Honorable Bob Bennett
Ranking Member
Subcommittee on Agriculture, Rural Development,
  Food and Drug Administration, and Related Agencies
Committee on Appropriations
United States Senate

The Honorable Rosa DeLauro
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Committee on Appropriations
House of Representatives

The Honorable Jo Ann Emerson
House of Representatives

The Honorable Ray LaHood
House of Representatives

The Honorable Tom Latham
House of Representatives

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Information Technology: Agriculture Needs Stronger Management Practices for Stabilizing and Modernizing Its Farm Program Delivery Systems

Briefing for the Staff of the

Senate Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies, Committee on Appropriations

and the

House Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies, Committee on Appropriations

March 25, 2008

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**Appendix I: Briefing to Staff of Congressional
Requesters on USDA's Stabilization and
Modernization Efforts**

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Outline of Briefing

- Introduction

- Objectives, Scope, and Methodology

- Results in Brief

- Background

- Extent to which USDA's Stabilization Plan Addresses Key Management Issues

- Adequacy of USDA's Assessment of Existing Product Capabilities and Cost and Schedule Estimates for a New, Modernized Farm Program Delivery System

- Conclusions

- Recommendations

- Agency Comments and Our Evaluation

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Appendix I: Briefing to Staff of Congressional
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Introduction

The Department of Agriculture (USDA) recently experienced significant problems with its information technology (IT) systems that support the delivery of benefits programs to farmers—called farm program delivery systems in this briefing. In October 2006, these systems began experiencing considerable delays while attempting to process a large number of transactions and, by January 2007, the systems became inoperable for a period of one month. Among other things, this outage led to significant delays in USDA's delivery of benefits to farmers.

In response to these issues, USDA developed a near-term plan to stabilize its farm program delivery systems. USDA also has long-term plans to modernize its delivery of these programs. The long-term project, which has been in the planning stage since 2004, is known as MIDAS—Modernize and Innovate the Delivery of Agricultural Systems—and is envisioned to be an entirely new farm program delivery system.

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Objectives, Scope, and Methodology

As agreed, our objectives for this review were to

- assess the extent to which USDA's stabilization plan addresses key management issues including consistently tracking reported problems, establishing performance metrics and goals, and defining roles and responsibilities; and

- determine the adequacy of USDA's assessment of existing product capabilities and cost and schedule estimates for its new, long-term modernization investment.

To address our first objective, we

- reviewed relevant GAO and industry reports and guidance to identify key management practices;

- reviewed and analyzed USDA's near-term plans for stabilizing farm program delivery systems to identify the activities that the plan covers;

- analyzed system performance documentation, including an independent validation and verification report and other internal system performance assessments;

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Objectives, Scope, and Methodology

- compared the stabilization plan with key practices for managing information systems; and

- interviewed officials from USDA, the Farm Service Agency (FSA), the Natural Resources Conservation Service (NRCS), Rural Development (RD), and end users of the systems.

To address our second objective, we

- identified key practices and lessons learned from previous GAO reports and other guidance such as the Software Engineering Institute's (SEI) *Capability Maturity Model Integration*[1] regarding defining requirements, assessing existing product capabilities, and preparing cost and schedule estimates,

- reviewed and analyzed FSA's business case, cost-benefit analysis, and an analysis of alternative implementation options for its modernization initiative,

- interviewed officials from USDA and FSA to discuss their approach to planning the development of MIDAS, and

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[1]Software Engineering Institute, *CMMI Acquisition Model (CMMI-AM), Version 1.1*, (Pittsburg, Penn.: May, 2005).

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Objectives, Scope, and Methodology

- interviewed officials from OMB to obtain their perspective on USDA's plans to modernize its program delivery systems.

We performed our work at USDA in Washington, D.C., and Kansas City, Missouri, and at the Office of Management and Budget (OMB) in Washington, D.C., from May 2007 to January 2008. We conducted this audit 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.

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Results In Brief

Although USDA's plan to stabilize the agency's farm program delivery systems focuses on technical issues such as expanding telecommunication channels and acquiring a means for disaster backup and recovery, it does not address key managerial issues. For example, the plan does not address USDA's inconsistent tracking of users' reported problems with the system, provide for the development of performance metrics and goals to assess system performance, or clearly define organizational roles and responsibilities. While USDA officials indicated that they plan to address system performance management issues in a future version of the stabilization plan, they do not yet have plans to enable USDA to consistently track users' reported problems and to clarify roles and responsibilities. As a result, USDA cannot be assured that its stabilization efforts will enable the department to reliably deliver farm benefit programs to its customers.

Regarding USDA's proposed long-term investment in MIDAS, officials have plans under way to obtain the necessary information for assessing the capability of products to integrate existing USDA systems; however, they have not yet adequately assessed cost and schedule estimates by using key information such as MIDAS business requirements to develop the estimates. As a result, it is uncertain whether the department will be able to deliver MIDAS within the cost and schedule time frames it has proposed.

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Results In Brief

We are recommending that the Secretary of USDA direct the department's Chief Information Officer to work with FSA's Chief Information Officer to develop specific plans for consistently tracking users' reported problems and clearly define the roles and responsibilities of organizations involved in stabilizing USDA's farm program delivery systems. We are also recommending that the Secretary direct the Chief Information Officer to work with FSA's Chief Information Officer to develop reliable cost and schedule estimates based on business requirements.

We received comments on a draft of this briefing via e-mail from a management analyst at USDA. According to the analyst, coordination has occurred with officials from FSA, USDA's Office of the Chief Information Officer, and USDA's Office of the Chief Financial Officer. The analyst stated that these officials generally agreed with our findings, conclusions, and recommendations. The department also provided technical comments that we have incorporated, as appropriate.

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Background

One of USDA's major tasks is to manage and administer benefits to farmers through programs that support farm and ranch production, natural resources and environmental conservation, and rural development. USDA's FSA is one of three service center agencies that are responsible for administering these programs. In fiscal year 2008, USDA estimates that it will spend approximately $29 billion in farm loan, commodity, and conservation programs and $15 billion in rural housing, utilities, and business development programs.

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Background

FSA supports the delivery of approximately 100 farm programs through its 2,280 county-based service centers. Major programs include:

- The Direct and Counter Cyclical Program, which may be used by farmers to offset the difference when the market price for a specific crop falls below a defined target price.

- The Loan Deficiency Payment Program, which provides farmers short-term funds to pay expenses when market prices fall below the "loan" price (also known as the loan rate, which is different from the interest rate charged on marketing loans).

- The Noninsured Crop Disaster Assistance Program, which is designed to provide aid for uninsured crops that are destroyed through natural disasters.

- The Conservation Reserve Program, which is intended to reduce erosion, protect streams and rivers, enhance wildlife habitats, and improve air quality through incentive payments and cost sharing.

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Background

FSA currently uses two primary systems to process applications and user data in support of the delivery of farm benefit programs. However, both systems have shortcomings. One system consists of a distributed network of IBM Application System/400 (AS/400) computers running software to emulate[2] IBM's System 36 computers, which were used in the service centers in the 1980s. The use of emulation software allows USDA to use the same program applications and data structures for these computers as were previously developed for the System 36 computers, but this configuration also limits the capabilities of the AS/400s.These computers no longer fully meet business needs or internal control and security requirements. Beginning in 2002, USDA also has used a centralized "Web farm"—an array of interconnected computer servers that exchange data—to supplement the AS/400s with a Web-based interface for specific programs. While FSA has been in the process of transitioning specific farm program applications from the AS/400s to the Web farm, it has encountered substantial performance problems with the Web farm.

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[2]Emulation software enables the use of programs not originally intended for a particular computer system.

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Background

FSA maintains 2,555 AS/400 computers (one or more for each service center) with software applications to process most of its approximately 100 farm programs. The AS/400s store customer information and use it locally for specific program delivery applications.

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Background

The Web farm stores customer data and hosts Web-based applications. FSA's Web farm is located in Kansas City and is hosted on a network known as the Common Computing Environment.[3]

To date, FSA has transferred approximately 10 to 30 percent of its programs to the Web farm, including several of the previously mentioned farm programs:

- the Loan Deficiency Payment Program, also called the Electronic Loan Deficiency Program (e-LDP) in September 2004,

- the soils database and processes for documenting participation offers for the Conservation Reserve Program (CRP) in April 2004,[4] and

- the enrollment processes for the Direct and Counter-Cyclical Program (DCP) in October 2005.[5]

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[3] The Common Computing Environment provides a network connecting the three service center agencies and provides administrative applications—such as common e-mail, telecommunications, and Microsoft Office tools—to the three agencies.

[4] The AS/400s still host the application software for maintaining contracts and annual CRP rental payments.

[5] The AS/400s still host the application software for payment processes.

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Background

There are two methods for applying for and obtaining benefits from USDA farm programs. The method that is used depends on which system is hosting the desired program:

- If the desired program is hosted on the Web farm, the customer has the option of accessing it from a home or business computer or visiting a local county service center,[6] where staff use the Web farm to complete the customer's transaction.

- If the desired program is hosted on the AS/400s, the customer must visit, mail, or fax documents to a local service center, where the staff use the AS/400s to complete the customer's transaction.
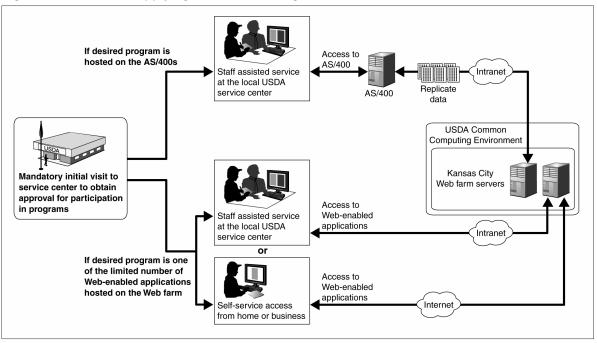
The following graphic illustrates the two methods for applying for and receiving benefits.

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[6]Customers may also mail or fax documents to the service centers for the staff to process.

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Background

Figure 1: Methods for Applying for and Obtaining Benefits

Source: GAO analysis of USDA data.

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Background

According to USDA officials, the AS/400s emulating the System 36 operating system are antiquated and no longer meet business needs.

- IBM first introduced the System 36 computers in 1983 and the AS/400s in 1988. According to USDA, these computers are now obsolete and, therefore, the company is no longer supplying replacement parts or providing maintenance services to USDA for these machines.

- The AS/400 computers have limited storage. The storage for an AS/400 computer is 17 gigabytes. In comparison, today's personal computers usually have approximately 20 to 30 times more storage. As a result, an AS/400 can store only a limited number of files. Since many service centers reach their full capacity for file storage on a daily basis, USDA must take extra steps to monitor the status and, if necessary, work with the service centers to remove files from the system when the storage is overloaded.

- Applications running on the AS/400s are written in a legacy programming language (COBOL). As a result, according to USDA officials, they have had difficulty finding programmers who are knowledgeable in this programming language to build and maintain additional applications for the computer.

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Background

- AS/400s can store customer information only locally at the county offices. Customers are unable to use different service centers to complete their transactions.

USDA officials have also indicated that the AS/400s are not in compliance with internal control and security requirements.

- According to officials, because of technological limitations, the AS/400s emulating System 36 computers are not in compliance with internal control requirements as specified in OMB Circular A-123, "Management's Responsibility for Internal Control" and security requirements established under the Federal Information Security Management Act. For example, officials stated that they currently have limited mechanisms in place to prevent fraud and abuse when using the AS/400s because the AS/400s do not allow USDA to run software that would limit the access of service center employees to information necessary to performing their duties.

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Background

As previously stated, the Web farm also has shortcomings. Specifically, as USDA began
to transfer more programs from the AS/400s to the Web farm, performance issues
developed and gradually became more severe, ultimately leading to USDA's inability to
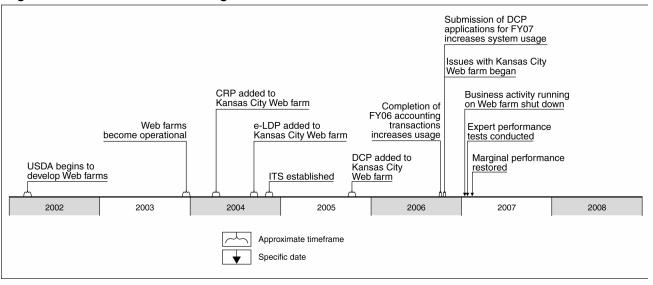deliver farm programs to many customers in early 2007.

- Significant performance problems began in October 2006 and became progressively
  worse when the use of the Web farm dramatically increased in order to complete
  prior-year accounting transactions and to process direct and counter-cyclical
  payment applications for the new accounting year.

- On January 13, 2007, the majority of business applications running on USDA's Web
  farm shut down for approximately a month. On February 14, 2007, USDA restored
  service based on the Web farm. According to USDA officials, the Web farm
  continued to experience 4-6 hours of unscheduled outages each week after this time.
  During outages, service center staff were unable to provide reliable customer service
  due to slow transaction speeds, Web page display errors, delays in updates to Web-
  based applications, and had to continually re-enter Web-based application data.

The following figure provides a timeline of events leading up to the destabilization of the
Web farm.

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Background

Figure 2: Timeline of Events Leading to the Destabilization of the Web farm

Submission of DCP
applications for FY07
increases system usage

Issues with Kansas City
Web farm began

CRP added to
Kansas City Web farm

Completion of
FY06 accounting
transactions
increases usage

Business activity running
on Web farm shut down

Web farms
become operational

e-LDP added to
Kansas City Web farm

Expert performance
tests conducted

DCP added to
Kansas City
Web farm

Marginal performance
restored

USDA begins to
develop Web farms

ITS established

| 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |

Approximate timeframe

Specific date

Source: GAO analysis of USDA data.

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Background

Over the past two years, USDA has had various organizations and individuals identify specific technical issues pertaining to the Web farm. In addition, in January 2007, USDA officials assembled a group of experts to conduct performance tests on the system to identify additional technical issues that contributed to the performance problems. The identified issues include:

- Inefficiently designed and structured databases caused benefits transactions to be processed slowly during FSA's peak usage periods.

- USDA lacked 2 of the 5 commonly recommended testing environments, which, if implemented, could have been used to identify the potential adverse effects of adding new applications to the Web farm.

- Insufficient bandwidth of firewalls serving the county-based agencies resulted in USDA's inability to accommodate increases in Web farm traffic.

In May 2007, Congress appropriated $37.5 million to be used by USDA for the stabilization of farm programs' existing delivery systems.

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Background

USDA's current IT support structure was established by merging IT staff from FSA and the two other service center agencies into one organization—Information Technology Services (ITS)—within the Office of the Chief Information Officer. The new organization was designated to support and maintain the Common Computing Environment. ITS provides operations, maintenance, and help desk support for equipment, telecommunications, and administrative applications.

While ITS supports the platforms and infrastructure across the service center agencies, the responsibility for developing and operating applications that support program delivery remains with the individual service center agencies. For example, FSA has developed 143 different applications to support more than 100 farmer benefit programs and is responsible for maintaining these applications. For this reason, FSA continues to maintain its own IT services division, headed by its own chief information officer.

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Background

With regard to its long-term modernization program, USDA began planning the MIDAS initiative in January 2004. It is aimed at reengineering agency business processes and correcting weaknesses in aging IT systems and, according to the MIDAS fiscal year 2007 business case, the initiative was planned to be completed by fiscal year 2020. According to USDA, MIDAS is intended to:

- improve the overall delivery of benefits to FSA customers through the use of the Internet,

- modernize system operations to remediate IT weaknesses,

- correct financial material weaknesses and integrate with USDA's financial modernization plan,

- provide flexibility in responding to changes in program requirements as defined by new legislation, and

- provide computing environments that comply with legislative requirements such as the Federal Information Security Management Act.

From January 2004 through January 2006, officials reported that they had spent $14 million defining requirements and conducting the initial planning for MIDAS. However,

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Background

USDA never completed the MIDAS requirements development process because key program officials lost confidence that the process would be an effective solution to meet USDA's future business needs and consequently withdrew their support.

Subsequently, in the summer of 2006, USDA changed direction from building a customized system to acquiring commercial off-the-shelf enterprise resource planning software.[7] USDA officials stated that this approach would be more flexible in adapting to new legislative requirements and would reduce overall IT operating costs for the department.

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[7]Enterprise resource planning refers to the use of commercial off-the-shelf software that incorporates shared data from various lines of business and that is consistent across an entire organization.

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Background

The department is currently still in the planning phase for MIDAS. In September 2007, USDA hired an executive program manager for the MIDAS initiative. Officials have indicated that they have additional requirements definition work under way to complete the foundational requirements and expect to finish this work by the third quarter of fiscal year 2008.[8] Subject to the availability of funds, they also plan to issue a request for proposals to acquire and implement the system later in 2008.

USDA currently estimates that the life cycle cost of MIDAS will be $455 million and is planning for a two-year implementation schedule from the time it awards a contract. Since an award date has not been established, a specific implementation schedule has not been developed.

MIDAS has been on OMB's high risk IT project list[9] since fiscal year 2006.

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[8]According to USDA officials, detailed requirements development work will be completed by the contractor following an award.
[9]High risk projects are projects requiring special attention from oversight authorities and the highest level of agency management because of one or more of the following four reasons: (1) the agency has not consistently demonstrated the ability to manage complex projects; (2) the projects have exceptionally high development, operating, or maintenance costs; (3) the projects are addressing deficiencies in the agencies' ability to perform an essential mission program or function of the agency; or (4) the projects' delay or failure would impact the agencies' essential mission functions.

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Objective 1: Addressing Key Management Issues

USDA has developed a stabilization plan, but has not addressed key managerial issues with its farm program delivery systems.

To successfully implement any IT project, both technical as well as managerial issues should be addressed. Regarding managerial issues, the Project Management Institute[10] and the Information Technology Infrastructure Library (ITIL)[11] both indicate that good program management includes consistently tracking users' reported problems, developing reportable metrics for measuring performance, and defining clear roles and responsibilities among project teams. Instituting these good management practices can help ensure that a solid foundation for achieving an IT project's objective is established.

In April 2007, USDA established a plan for stabilizing its farm program delivery systems. The plan, which focuses on technical issues identified by USDA officials and outside experts, has the following objectives:

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[10]Project Management Institute, *A Guide to the Project Management Body of Knowledge (PMBOK)*, 3rd ed. (Newton Square, Penn.; 2004).
[11]The ITIL is a set of best practices guidance for IT service management owned by the Office of Government Commerce within the government of the United Kingdom.

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Objective 1: Addressing Key Management Issues

- Expand telecommunication channels, acquire firewalls with greater bandwidth, and optimize Web farm software and databases to address the inefficient design and structure of the databases and thus improve the efficiency of performing transactions.

- Conduct a review of the technical architecture of the Common Computing Environment to improve FSA's understanding of all existing components of its farm delivery systems.

- Build a data warehouse to centralize customer data to enable FSA to more efficiently conduct program management oversight and generate reports pertaining to farm programs.

- Implement monitoring tools, configuration management practices, and the two missing testing environments to help enable USDA to be more proactive in identifying performance problems.

- Acquire a means for disaster backup and recovery, which does not currently exist.

- Invest in specialized staff training and development to help ensure that users optimize the capabilities of these new tools and applications.

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Objective 1: Addressing Key Management Issues

USDA began to address these objectives in 2007 and plans to continue the stabilization effort through 2010.

The plan also includes high-level descriptions of each of the sub-projects intended to address the objectives. In addition, it includes implementation schedules for the sub-projects and the management structure for overseeing the project.

According to USDA officials, as of October 2007, they had spent approximately $18 million to take steps towards achieving these objectives. For example, they had expanded telecommunication channels, acquired more sophisticated firewalls, and had a contractor prepare the first draft of process flow diagrams of selected program delivery processes.

USDA estimates it will spend an additional $131 million from fiscal year 2008 through 2010 to complete its technical plan for stabilizing the Web farm. Major tasks that remain include building a data warehouse to centralize customer data and acquiring a means for disaster backup and recovery.

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Objective 1: Addressing Key Management Issues

While USDA has developed a stabilization plan that focuses on various technical weaknesses relating to its farm programs' delivery system, the plan does not address key managerial areas. Specifically:

- USDA has had difficulty ensuring that it consistently tracks problems that users encounter with the Web farm. Rather than using a consistent approach for reporting and resolving problems, which could enable USDA to more accurately identify issues with the system, users have been informally obtaining assistance from their colleagues to solve problems. According to a report issued by an independent verification and validation contractor in October 2007, there has been widespread use of such informal networks for problem resolution. Moreover, certain employees did not have access to USDA's customer service ticketing system; therefore, problems that were reported by those without access to the ticketing system were not being centrally tracked. As a result, these problems are not being tracked and monitored consistently, thus contributing to unreliable information about system performance. Further, the current stabilization plan does not address the need to improve problem tracking. USDA officials indicated that they established a separate initiative in April 2007 to address this issue, although they have not yet provided us with any details regarding it.

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Objective 1: Addressing Key Management Issues

- ITS lacks measures for the performance of the Web farms. During an assessment of the Kansas City Web farm in the fall of 2006, agency officials reported that they did not have real-time statistics available on the Web farm's performance, and that they needed statistics such as data processing time, firewall activity, and utilization of the telecommunications network. While officials have indicated that in November 2007 they implemented automated tools to monitor the system and to collect performance data, such as processing and utilization time, ITS does not have dedicated staff to analyze and use the collected performance data. Additionally, ITS has not established performance goals for the Web farm.

  While FSA's Chief Information Officer indicated that USDA officials are aware of the performance management issues, they indicated that they did not want to address them in their stabilization plan until they had investigated them more thoroughly. The report by the independent verification and validation contractor provided additional analysis and offered recommendations to USDA for resolving the performance management problems and other issues. For example, the contractor recommended that USDA establish performance metrics for all ITS business service areas and create a dedicated ITS team to conduct performance management activities. In response to this study and our inquiries about how the

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Objective 1: Addressing Key Management Issues

study's recommendations would be addressed, USDA officials indicated that they plan to update the stabilization plan by February 2008 to address the identified performance management issues.

- USDA lacks clearly defined organizational roles and responsibilities for stabilizing the Web farm. As previously mentioned, USDA's ITS organization has overall responsibility for operating and maintaining the Web farm hardware and the Common Computing Environment network; FSA's ITS division is responsible for operating and maintaining FSA applications for farm programs. However, USDA's stabilization plan indicates that ITS and FSA are both "owners" of all planned improvement activities and does not clearly establish the specific roles and responsibilities of these respective organizations. As we have previously reported, effective management of programs requires clear definitions of roles and responsibilities. The extent to which these are explicit and unambiguous goes a long way towards ensuring proper accountability and performance. USDA officials indicated that they had overlooked that aspect of their plan, and they do not yet have plans to address the lack of clearly defined roles and responsibilities for stabilizing the Web farm in the updated version of the stabilization plan.

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Objective 1: Addressing Key Management Issues

Until USDA addresses the inconsistent tracking of users' reported problems and the lack of clearly defined roles and responsibilities, it may not be able to establish a solid foundation for achieving and sustaining stability in the farm program delivery systems. As a result, the department faces the risk that its stabilization plan will not ensure that it is able to successfully deliver benefits to farmers in the future.

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**Objective 2: Assessment of Capabilities, Cost, and
Schedule for Modernization**

While the department has plans under way to obtain the information necessary to assess
the capabilities of commercial off-the-shelf enterprise resource planning products for
MIDAS, it has not:

- adequately assessed the cost of its proposed approach or

- adequately assessed the schedule for its proposed approach.

Without developing reliable cost and schedule estimates using business requirements to
derive the estimates, it is questionable whether USDA will be able to deliver MIDAS within
the cost and schedule it has proposed.

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Objective 2: Assessment of Capabilities, Cost, and Schedule for Modernization
Plans Under Way to Assess Product Capabilities

USDA has not yet fully assessed the capabilities of commercial products to integrate with key USDA systems, but has plans under way to do so.

SEI[12] recommends that organizations planning to acquire a new enterprise resource planning system understand the capabilities of existing products. More specifically, it recommends that the organization understand the ways in which the new system will interface with legacy systems.

In June 2006, the department issued a request for information to learn about vendors' enterprise resource planning product capabilities, and the responses were used to develop USDA's investment justification documentation. However, USDA did not request that vendors provide detailed information regarding the capability of commercial off-the-shelf products to integrate with key USDA systems, such as the department's existing documents and records management system and service center customer database. Officials indicated that they have met with a few other federal agencies that have

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[12]Smith, et. al., "Enterprise Integration," *The Architect*, vol. 5, no. 4 (Pittsburg, Penn.; SEI, Fourth Quarter 2002), http://www.sei.cmu.edu/news-at-sei/columns/the_architect/2002/4q02/architect-4q02.pdf (accessed Jan. 4, 2008).

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Objective 2: Assessment of Capabilities, Cost, and Schedule for Modernization
Plans Under Way to Assess Product Capabilities

implemented enterprise resource planning products to obtain lessons learned. Officials stated that in order to save time, rather than issuing another request for information, they plan to solicit this information in their request for proposals.

USDA's inclusion of sufficient detail regarding the existing systems, with which the commercial off-the-shelf enterprise resource planning product needs to be integrated, may facilitate the agency's assessment of proposals.

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**Objective 2: Assessment of Capabilities, Cost, and
Schedule for Modernization**
Inadequate Assessment of Costs

USDA has not adequately assessed the costs of MIDAS.

GAO's Cost Assessment Guide[13] provides best practices for establishing reliable cost estimates to be used in the software acquisition process. Specifically, GAO's Cost Assessment Guide states that key information such as requirements should be used to develop cost estimates.

As previously mentioned, USDA had worked to define requirements for MIDAS, but this effort was never completed. As a result, business requirements were not used as a basis for their life cycle cost estimate of $455 million. Instead, their estimate was based primarily on the cost estimate for another unrelated USDA IT investment, the Financial Management Modernization Initiative.[14] Officials also indicated that they had used information provided by vendors in response to USDA's request for information. However, while the department requested that vendors provide cost estimates as part of the request for information for MIDAS, three vendors indicated that they could not develop such

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[13]GAO, *Cost Assessment Guide: Best Practices for Estimating and Managing Program Costs, Exposure Draft,* GAO-07-1134SP Washington, D.C.: July 2007).
[14]USDA's Financial Management Modernization Initiative is a significant IT modernization effort that intends to address material financial weaknesses through improving its general ledger and administrative payment system.

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**Objective 2: Assessment of Capabilities, Cost, and
Schedule for Modernization**
Inadequate Assessment of Costs

estimates because USDA had not provided enough specific information regarding its
needs for hardware, software, and labor in order for the vendors to provide an estimate.
Other vendors supplied a generic price list. As a result, the department had only a limited
basis for deriving the cost figures for MIDAS.

USDA officials acknowledge that they had limited information to use as a basis for
developing their cost estimate. However, the department included the $455 million figure
in its business case for justifying the investment in MIDAS. According to USDA officials,
they included this figure because it was the best estimate they could derive given the
information they had.

Not until after the cost estimate was developed did USDA officials begin analyzing the
partially-defined requirements to determine what requirements could be applied to the
new approach of acquiring a commercial off-the-shelf product for MIDAS. As previously
mentioned, officials have additional requirements definition work under way to complete
the foundational business requirements and expect to finish this work by the third quarter
of fiscal year 2008.

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Objective 2: Assessment of Capabilities, Cost, and Schedule for Modernization
Inadequate Assessment of Costs

Without defined complete business requirements, significant questions will remain regarding the accuracy and reliability of the MIDAS cost estimate.

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**Objective 2: Assessment of Capabilities, Cost, and
Schedule for Modernization**
Inadequate Assessment of Schedule

USDA has not adequately assessed the implementation schedule for MIDAS.

According to SEI,[15] a systematic assessment of business requirements can also provide an organization with the opportunity to conduct a realistic estimate for the project schedule.

In its fiscal year 2008 business case for MIDAS, the department committed to accelerating its implementation of MIDAS from ten years to two years. According to USDA officials, they decided to accelerate the implementation in order to deliver a long-term solution to problems the department is experiencing with its existing program delivery systems more quickly.

As part of USDA's plan to reduce the time frame for implementing MIDAS by 80 percent, officials plan to condense the requirements analysis phase from four years to five months. Moreover, they plan to reduce the analysis and design portion of the acquisition from three and a half years to nine months.

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[15]SEI, *Software Acquisition Capability Maturity Model (SA-CMM) Version 1.03,* (Pittsburg, Penn.: March 2002).

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**Objective 2: Assessment of Capabilities, Cost, and
Schedule for Modernization**
Inadequate Assessment of Schedule

However, according to USDA officials, similar to the cost estimation process, the schedule estimates had been based on previous experience and not on an understanding of the business requirements. Additionally, officials said that they are unaware of any programs that have been able to employ a similar product implementation within a two-year time frame. While USDA has produced a high-level description of the accelerated implementation, the department does not plan to establish a detailed project schedule for MIDAS until it has selected a vendor for the implementation.

The lack of a reliable basis for the two-year implementation schedule for MIDAS significantly increases the risk that the department will not be able to implement MIDAS within this time frame. Furthermore, schedule overruns could lead to further problems such as cost overruns.

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Conclusions

While USDA's stabilization plan focuses on addressing technical issues, the plan is inadequate because it does not address key managerial weaknesses. USDA officials recently indicated that they plan to address one of these three issues in a future version of their stabilization plan; however, they do not have plans to address the inconsistent tracking of users' reported problems and the lack of clearly defined roles and responsibilities. As a result, the department cannot be assured that its stabilization efforts will enable it to reliably deliver farm benefit programs to its customers.

Additionally, officials have plans under way to obtain the information necessary for assessing vendors' ability to integrate existing USDA systems with commercial off-the-shelf enterprise resource planning products; however, they have not yet adequately assessed cost and schedule estimates by using key information such as business requirements to develop the estimates. As a result, it is uncertain whether the department will be able to deliver MIDAS within the cost and schedule time frames it has proposed.

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Recommendations

We recommend that the Secretary of USDA direct the department's Chief Information Officer to work with FSA's Chief Information Officer to develop specific plans for consistently tracking users' reported problems and clearly defining roles and responsibilities for ITS and FSA.

We also recommend that the Secretary of USDA direct the department's Chief Information Officer to work with FSA's Chief Information Officer to fully assess USDA's investment in MIDAS, including:

- establishing effective and reliable cost estimates using industry best practices, including using key information such as business requirements to develop the estimates and

- establishing a realistic and reliable implementation schedule for MIDAS that is based on complete business requirements.

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Agency Comments and Our Evaluation

We received comments on a draft of this briefing via e-mail from a management analyst at USDA. According to the analyst, coordination has occurred with officials from FSA, USDA's Office of the Chief Information Officer, and USDA's Office of the Chief Financial Officer. The analyst stated that these officials generally agreed with our findings, conclusions, and recommendations. The department also provided technical comments that we have incorporated, as appropriate.

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Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact	Linda D. Koontz, (202) 512-6240 or koontzl@gao.gov
Staff Acknowledgments	In addition to the contact named above, John de Ferrari (Assistant Director), Marisol Cruz, Neil Doherty, Nancy Glover, Josh Leiling, James MacAulay, and Shannin O'Neill made key contributions to this report.