

OFFICE OF
INSPECTOR GENERAL

Report of Audit

Information Technology
Infrastructure
Project Management

A-07-02

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Auditor-in-Charge



FARM CREDIT ADMINISTRATION

Memorandum

Office of Inspector General
1501 Farm Credit Drive
McLean, Virginia 22102-5090



June 18, 2008

The Honorable Leland A. Strom
Chairman of the Board
Farm Credit Administration
1501 Farm Credit Drive
McLean, Virginia 22102-5090

Dear Chairman Strom:

The Office of the Inspector General completed an audit of the Information Technology Infrastructure Project Management. The objective of this audit addressed the project management practices used by the FCA to minimize risks associated with making significant changes to the information technology infrastructure.

We determined that the IT Infrastructure Project was well planned and managed, and the process complied with Agency policy and best practices. We did note one area where improvement could be made. The Office of Management Services (OMS) has agreed to develop a quality assurance process for IRM Plans that includes verification of estimated project costs.

We conducted the audit in accordance with *Government Auditing Standards* issued by the Comptroller General for audits of Federal organizations, program, activities, and functions. We conducted fieldwork from October 2007 through March 2008. We provided a discussion draft report to management on April 28, 2008, and conducted an exit conference regarding the discussion draft report with the Chief Information Officer and Director of OMS on May 22, 2008. We then provided a final draft report to management on June 4, 2008.

We appreciate the courtesies and professionalism extended to the audit staff. If you have any questions about this audit, I would be pleased to meet with you at your convenience.

Respectfully,

A handwritten signature in black ink that reads 'Carl A. Clinefelter'. The signature is written in a cursive style.

Carl A. Clinefelter
Inspector General

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EXECUTIVE SUMMARY

The FCA is in the process of migrating its IT infrastructure from a legacy platform to a tightly integrated solution. The migration of the IT infrastructure is a large, complex project affecting all users of FCA systems. The most significant changes to the IT infrastructure include:

- new notebooks and personal digital assistants;
- an upgrade in the notebook operating system and office automation software;
- replacement of the Agency's email and calendar application;
- unified messaging;
- centralized network services;
- an upgrade of the telecommunications infrastructure; and
- migration of legacy applications and databases to a new database management system and collaboration and document management platform.

The Agency has dedicated significant resources to the IT infrastructure transition including extensive man-hours and direct expenses.

The OIG performed an audit of the project management of the IT Infrastructure Project because of the long term impact this project will have on the Agency and the amount of resources devoted to this project. The objective of our audit was to determine if the Agency is using sound project management practices to minimize risks associated with making significant changes to the IT infrastructure.

We evaluated the effectiveness of project management and determined that the IT Infrastructure Project was well planned and managed, and the process complied with Agency policy and best practices. The OMS utilized a group of users throughout the Agency to perform a pilot of the proposed IT infrastructure providing confirmation that the proposed tools would benefit the Agency and meet user needs. In addition, the Agency is using a phased implementation approach breaking down the IT Infrastructure Project into a logical sequence of activities minimizing the risks associated with a large project.

The project costs are within the approved IRM budget. Although the project encountered some schedule slippage as a result of external factors, the overall project should meet its targeted completion by December 2009. In addition to enhanced productivity and long term cost savings, the Agency will benefit from improved communication and collaboration, improved data access, and simplified IT maintenance.

We did note one area where improvement could be made. The OMS should develop a quality assurance process for IRM Plans that includes verification of estimated project costs.

INTRODUCTION AND BACKGROUND

In fiscal year 2007, the FCA performed a review of its IT infrastructure to determine if alternative technologies would benefit the Agency. Since the pilot results of the proposed IT infrastructure were favorable, the Agency decided to migrate to the new IT infrastructure using a phased implementation approach. The IT infrastructure hosts and delivers all applications at FCA and is essential to efficiently providing the tools users need to perform their duties. The OIG selected this project to audit because of the long term impact this project will have on the Agency and the amount of resources devoted to the project. Without effective project management, the project is at risk for not satisfying the needs of the Agency, exceeding budget, and/or not meeting the planned schedule.

Since the previous IT infrastructure was implemented in 1994 and nearing the end of its lifecycle, the Agency included an IT Infrastructure Review Project in its 2007 IRM Plan to evaluate the methods of delivering IT services and determine if an alternative IT infrastructure would better meet the future needs of the Agency.

From June through August of 2007, the OMS partnered with an experienced contractor and performed a pilot approach to the proposed IT infrastructure. The pilot included a group of users throughout the Agency. The pilot group tested replacement notebooks and an integrated suite of tools that included an upgraded operating system, upgraded office automation software, new email and calendar solution, unified messaging, as well as other communications and collaboration tools.

“The pilot demonstrated that the new infrastructure will provide FCA several key benefits. The selected products delivered significant capability improvements over the existing infrastructure, particularly in the areas of communications, collaboration, data access, and enterprise search on a platform designed to support mobile, disparate users. The simplified maintenance of the new design will allow OMS to deliver more capabilities in support of the mission of FCA without requiring significant increases in resources.”¹

In conjunction with the pilot, the contractor performed a business process review of three key Agency activities: the FCA examination process, the FCA regulation development process, and OMS service delivery. The contractor and OMS also worked together to migrate a sample of applications and databases to the new integrated IT infrastructure, as well as test a new network design.

In September 2007, the CFO/Director of the OMS and CIO approved a phased implementation of the integrated IT solution as a result of the TT Project Manager’s formal recommendation and successful outcome of the pilot.

The OMS completed a rollout of new notebooks and desktop tools in March 2008 and anticipates completion of the upgraded telecommunications infrastructure, and application and database migration, the final phases of the IT infrastructure transition, by December 2009.

¹ Excerpt from September 5, 2007 Decision Memorandum issued by the TT Project Manager to the CIO and Director, OMS

OBJECTIVES

The objectives of this audit were to determine if FCA is using sound project management practices to minimize risks associated with making significant changes to the IT infrastructure. We evaluated the effectiveness of project management and determined if it complied with Agency policy and best practices.

SCOPE AND METHODOLOGY

The scope of this audit was limited to reviewing the project management of the IT Infrastructure Project. As of March 2008, the rollout of the new notebooks and network infrastructure was complete and the application/database migration was in the planning phase. In conducting this audit, we performed the following steps:

- Identified and reviewed applicable FCA policies and procedures relating to IT project management;
- Identified and reviewed best practices relating to IT project management;
- Reviewed documentation relating to the IT Infrastructure Project and compared to applicable Agency policy and best practices;
- Conducted interviews with the CIO, Director of OMS, project managers, OMS staff, an IRMOC representative, and users; and
- Evaluated the effectiveness of the following project management elements:
 1. Project Plans;
 2. Project Scope and Requirements;
 3. Human Resources Management;
 4. Time Management;
 5. Cost Management;
 6. Communications;
 7. Quality Assurance; and
 8. Risk Management.

This audit was performed at the FCA headquarters in McLean, Virginia, from October 2007 through March 2008, in accordance with generally accepted auditing standards for Federal audits.

CONCLUSIONS AND RECOMMENDATIONS

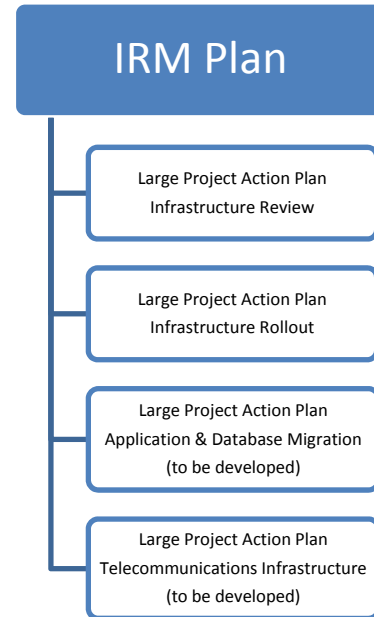
Project Plan

The FCA utilizes multiple tools for project planning of major IT investments. Annually, the Agency develops a six-year IRM Plan which is used as a guide for IT initiatives. In addition, project managers develop large project action plans that are used to identify and track the critical elements for large IT projects. The diagram on the right demonstrates the key planning tools used by project managers for the IT Infrastructure Project.

In 2005, the OMS developed Office Directive 003² requiring large IT projects to follow a process to ensure that risk is minimized through effective project management. This process includes the development of a “FCA Large Project Action Plan” prior to beginning material work or expenditure of IT resources on the project. Elements that must be identified in the large project action plan include:

- Goals and objectives;
- Project stakeholders;
- Major project milestones;
- Estimated FCA manpower;
- Major purchases over \$5,000;
- Communications plan;
- Contingency plan;
- Security plan; and
- Certification and Accreditation.

The large project action plans developed for the Infrastructure Review and Infrastructure Rollout contained all the critical elements required in Directive 003. The large project action plans contained clear goals and objectives. Project stakeholders were identified. Major project milestones were established. Manpower required for the project was estimated on a quarterly basis. Major purchases over \$5,000 were identified. A thorough communications plan was described. A contingency plan was considered for potential challenges to the project. The security plan is in the process of being updated and a milestone for a C&A of the new IT infrastructure was established.



² OMS Office Directive 003, Guidance for Project Management of Large Information Technology Projects (Total Cost More than \$500,000)

Although the large project action plans for the Infrastructure Review and Infrastructure Rollout contained the critical elements required by Directive 003, we found there was some overlap between the large project action plans. For example, the scope of the Infrastructure Review Large Project Action Plan included notebook replacement and a pilot evaluation of the proposed IT infrastructure. The scope of the Infrastructure Rollout Large Project Action Plan represented a phased implementation of the notebook deployment and IT infrastructure recommended during the Infrastructure Review pilot. As a result of this overlap, consulting costs for development of the prototype were included in both the Infrastructure Review Large Project Action Plan and the Infrastructure Rollout Large Project Action Plan. When developing large project action plans, the project manager should avoid duplication of items contained in previous plans.

Further, we determined that two additional large project action plans will be developed for managing subsequent phases of the project. The Infrastructure Rollout Large Project Action Plan identified a review and migration of applications and databases and review and installation of the telecommunications infrastructure during Phase II and III. The Infrastructure Rollout Large Project Action Plan did not identify specific milestones or estimated costs related to the telecommunications infrastructure, because the IT Project Manager plans to develop a separate large project action plan with additional milestones and estimates for the telecommunications infrastructure. There will also be a separate large project action plan for the review and migration of applications and databases providing additional details for that phase. However, the Infrastructure Rollout Large Project Action Plan did not refer to subsequent large project action plans that would be developed and incorporate more specific milestones and costs. For projects with multiple phases where additional large project action plans are necessary, the project manager should identify the items that will be included in additional large project action plans representing subsequent phases of the project.

Project Scope & Requirements

A clear understanding of the project is necessary to ensure the project stays on track and is properly controlled. A review of the decision memo, large project action plans, interviews, and IRMOC minutes demonstrated that the scope and requirements were clearly defined and linked to Agency mission as well as user needs. In addition, security, accessibility, and privacy requirements were identified and considered in the project.

The IT Infrastructure Project is a large complex project affecting all users of FCA systems. The implementation of the project will take place over a 2 ½ year period and includes a combination of recurring maintenance/replacement items as well as new development.

Specifically, the scope of the project includes:

- notebook replacement;
- client operating system upgrade ;
- office automation software upgrade;
- replacement of Agency email and calendar application;
- unified messaging;
- PDA replacement;
- decentralized servers to centralized wide area application services;
- update of disaster recovery site configuration;
- migration of legacy applications and databases to new database management system and new collaboration and document management platform;
- work process improvement; and
- telecommunications infrastructure upgrade.

Human Resources Management

Human resources management includes organizing and managing the project team and ensuring project support. Based on interviews and observations during this audit, we conclude that the Agency effectively managed the project team, provided adequate support to the IT Infrastructure Project, and provided adequate training to IT staff and users.

The IT Infrastructure Project involved various types of personnel throughout the Agency. The CIO and Director, OMS play an active role in overseeing the overall project, and the two project managers have an active daily role in managing their respective areas of the project. The IRMOC provided support throughout the project including limiting requests for new IT projects during critical times of the IT infrastructure transition. A pilot group representing users throughout the Agency was involved in evaluating the proposed infrastructure, performing testing, and providing feedback throughout various stages of the project.

We determined that key technical staff has the appropriate skill mix to ensure the success of the project through a combination of experience and training. Where certain new skills were required, a qualified and experienced contractor was used to assist and teach technical staff via knowledge transfer. The new application development tools require a significantly different skill set than required with the former IT infrastructure, which made it necessary for OMS to make changes to the AT. The Chief Human Capital Officer advised and assisted the CIO and project managers on personnel issues encountered as a result of the significant impact the new IT infrastructure would have on AT staff and the respective skills required to perform their jobs.

Appropriate technical training was provided and continues for the technical staff. In addition, the end users were provided with professional training performed by OMS staff and manuals for the new desktop tools.

Time Management

Effective time management ensures timely completion of the project. A schedule with milestones should be used for monitoring project progression, keeping the project on track, and ensuring sufficient staff resources. The IT Infrastructure Project was broken down into a logical sequence of phases and activities to minimize the risks associated with such a large project. The IT Infrastructure Project encountered some unanticipated difficulties primarily due to a manufacturing delay with the new notebooks. The change from Smart Phones to Blackberry devices did not significantly impact the schedule.

The IT Project Manager uses the Infrastructure Rollout Project Plan to monitor the progress of milestones and deliverables. This schedule is monitored and updated on a weekly basis. When necessary, changes are made to the schedule with a column for revised due dates and other notes. In addition to this schedule, the IT created sub-plans and schedules with details regarding specific tasks such as notebook configuration, Blackberry implementation, and McLean and field office rollouts. The IT was able to quickly reassign staff resources as necessary to meet the needs of the project.

The milestone for the C&A process was extended to June 2008 because of extenuating circumstances. The CIO and Security Officer have developed a contingency plan for the C&A process and are monitoring the situation closely. The C&A process provides assurance that the new IT infrastructure has adequate security.

The AT Project Manager plans to develop a schedule for the development and conversion of applications and databases after an inventory has been finalized and system sponsors have been consulted. The AT will develop estimates for each application and a large project action plan with supporting schedules for the application and database migration phase of the IT Infrastructure Project once the notebook rollout is complete and an inventory has been developed with key system sponsors. The AT Project Manager provided the CIO with the application and database inventory in April 2008.

Significant issues encountered during the project that impacted the schedule were communicated to the Board, management, and staff using various methods.

Cost Management

Effective cost management includes developing a budget to control spending and monitoring expenses throughout a project's lifecycle. FCA has an effective process for managing IT expenses by cost center and object class. Currently, costs associated with the IT Infrastructure Project are on track with the 2008-2013 IRM budget, large project action plans, and decision memorandum supporting the project. However, we identified some discrepancies in the project costs published in the 2008-2013 IRM Plan.

IT project budgets were developed by project managers and incorporated into the Agency's annual IRM Plan. The CIO and an IT Specialist coordinated the development of the IRM Plan. The IRMOC evaluated and ranked projects, and approved the 2008-2013 IRM Plan which was forwarded to the Chief Executive Officer. The IRM Plan feeds directly into the overall Agency budget. The adopted budget and expenses are monitored throughout the fiscal year by cost center and object class. The Finance Team provides periodic financial analysis and reports to offices and the Board comparing the budget to actual expenses.

In our comparison of detailed project estimates to the published 2008-2013 IRM Plan, we observed two instances where the Project Cost Detail did not reconcile with the IRM Plan. The Project Cost Detail spanning six years for the Infrastructure Review Project totaled \$2,561,985, but the published IRM Plan totaled \$2,285,985. The Project Cost Detail spanning six years for the Workflow Integration Project totaled \$760,480, but the published IRM Plan totaled \$820,480. We learned there were changes to the Project Cost Detail in both of these projects and the respective tables were not "refreshed" causing the misstatement in the 2008-2013 IRM Plan. Although these errors would not have changed the outcome of the IT Infrastructure Project, the Agency needs to ensure that costs are accurately reported in the IRM Plan to support informed decisions.

In addition to the IRM Plan, the project manager creates a more refined budget when developing the large project action plan that includes estimated manpower and direct expenses exceeding \$5,000. The Agency uses TRS to monitor hours devoted to projects, but does not formally track direct expenses for individual projects. In addition to tracking the budget by cost center and object class, we suggest the Agency consider tracking budgets and expenses associated with large projects and periodically report their status to the IRMOC.

Over the long term, the Agency should realize cost savings as a result of the new IT infrastructure because the new IT infrastructure costs less in both direct dollars and man hours to maintain than the legacy IT infrastructure. In addition to cost savings, the Agency benefits from modern technology which should enhance employee productivity and the Agency's ability to retain and recruit technology staff.

Agreed-upon Action:

1. The OMS will develop a quality assurance process for IRM Plans that includes verification of estimated project costs presented within the IRM Plan.

Communications

Various types of communication should be performed throughout the project and include senior managers, project team members, and stakeholders. The FCA developed and conducted a comprehensive communications strategy for the IT Infrastructure Project.

OMS provided staff and management with their plans for the IT infrastructure transition, reasons for the changes in IT infrastructure, anticipated benefits of the changes, and periodic status updates. OMS communications included:

- various briefings for the FCA Board on the status of the IT Infrastructure Project;
- monthly briefings to the IRMOC;
- utilizing a pilot group of users throughout the FCA to evaluate components of the new IT infrastructure and inform their respective offices of the pending progress;
- OMS monthly status reports and senior staff meetings;
- TT status reports to the CIO and IRMOC;
- CIO briefings to individual offices; and
- several FCA News Flash and FCA This Week articles to inform staff and management of progress and responsibilities for preparing for the IT infrastructure transition.

There was constant communication among the team using various methods. In addition to daily contact, the team had weekly project meetings that included the CIO, project managers, security officer, and key technical staff.

Quality Assurance

Quality assurance ensures that the project results in deliverables that meet stakeholder needs and expectations. FCA used various techniques to ensure quality was achieved during the IT Infrastructure Project such as employing a pilot of the proposed IT infrastructure, developing test plans, and performing testing throughout the project.

To ensure quality assurance was achieved, the Agency utilized a group of employees comprised of users throughout the Agency to test and evaluate the proposed IT infrastructure. These pilot users were tasked with evaluating new notebooks, a proposed operating system, applications, and new tools. This was an effective way of gaining user support while testing significant changes to the IT infrastructure. In addition, the pilot users determined whether the proposed changes were effective and efficient in their respective work environments. The pilot for the proposed IT infrastructure was an effective strategy that established the proof of concept for the proposed IT infrastructure and ensured user needs were met.

The TT developed test plans for the client notebook configuration, network infrastructure, field office IT infrastructure, unified messaging, and office communications. In addition, test plans will be developed for the application and database phase jointly by the system sponsor and the AT. Technology specialists were also responsible for testing the new IT infrastructure. Issues identified during testing were ranked for criticality then prioritized, tracked, and addressed.

Performing a review of three key Agency work processes complemented the IT infrastructure review and pilot. The goal of implementing more efficient and effective work processes through redesigned workflow and a new IT infrastructure have the benefit of maximizing employee productivity.

Risk Management

All projects are subject to risks that can cause a project to be delayed, exceed budget, or fail. Risks must be identified, monitored, and managed throughout large projects to ensure success of the project. The FCA managed risks during the project by performing a risk assessment, monitoring risks throughout the project, and contracting for an independent review of the implementation plan.

The OMS completed a risk assessment on October 24, 2007, for the IT Infrastructure Rollout Project. This risk assessment identified and evaluated potential risks to the project. Risk mitigation strategies and contingency plans were considered for identified risks. One of the primary risks identified by OMS was the consolidation of field office network equipment in McLean. To mitigate the risk of a single point of failure, redundancy was built in using the Emergency Operations Center and backup data lines. OMS also identified lack of acceptance by Agency users as a concern. This risk was mitigated with a comprehensive communications and training strategy. Other risks were also identified and mitigation strategies were considered.

The project managers and CIO actively monitored the project for potential risks and altered strategies when necessary. For example, the project managers adjusted the schedule as necessary when the receipt of notebooks was delayed.

The Agency contracted with a leading IT research and advisory firm to perform an independent verification and validation of the project plan. The results of this review were favorable and stated, "The implementation plan, results of the pilot study, and supporting documents all indicate that proper planning was conducted for this migration."

Other risk management techniques utilized by the Agency included using a phased approach and a pilot. A phased approach was used to minimize risk and enhance project success by breaking the project into distinct components with clear deliverables. The pilot confirmed the proposed IT infrastructure would provide the Agency with improved communications, collaboration, data access, and search capabilities while simplifying maintenance for IT staff.

ACRONYMS AND ABBREVIATIONS

| | |
|--------|---|
| Agency | Farm Credit Administration |
| AT | Applications Team |
| C&A | Certification and Accreditation |
| CFO | Chief Financial Officer and Director of the Office of Management Services |
| CIO | Chief Information Officer |
| FCA | Farm Credit Administration |
| IRM | Information Resources Management |
| IRMOC | Information Resources Management Operations Committee |
| IT | Information Technology |
| OIG | Farm Credit Administration's Office of Inspector General |
| OMS | Office of Management Services |
| PDA | Personal Digital Assistant |
| TRS | Time Recording System |
| TT | Technology Team |

R E P O R T

Fraud | Waste | Abuse | Mismanagement



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