NASA Office of the Chief Information Officer

Information Resources Management (IRM) Strategic Plan

September 2006

Approved by:

Dr. John W. McManus, PhD
Acting NASA Chief Information Officer

Table of Contents

Preface

Two years ago, President George W. Bush gave NASA a defining challenge for the 21st century with compelling new objectives outlined in the Vision for Space Exploration. The Vision commits our Nation to a new journey of exploration of the solar system, beginning with the return of humans to the Moon by the end of the next decade, and leading to subsequent landings on Mars and other destinations, such as near-Earth asteroids. The fundamental goal of the Vision is "to advance U.S. scientific, security, and economic interests through a robust space exploration program."

The strategic management of information and information technologies will be imperative to realizing the Vision for Space Exploration. Effectively managing, preserving, protecting, and disseminating the information required to achieve, and resulting from, exploration is vital to mission success. Therefore, NASA will plan, design, implement and manage programmatic and institutional information systems and services that enable NASA's Mission and managerial objectives, and in doing so, will meet the Agency's internal and external information needs, conforming to the highest standards of security and information management feasible, with the fewest number of systems possible.

This September 2006 version of the NASA Information Resources Management (IRM) Strategic Plan reflects the IRM strategies, goals and objectives required for the strategic management of information and information technologies (IT), directly contributing to mission success for the Agency.

Introduction

The NASA Chief Information Officer (CIO) has responsibility for ensuring that NASA's information assets are acquired and managed consistent with Federal policies, procedures, and legislation and that the Agency's Information Resource Management (IRM) strategy is in alignment with NASA's vision, mission, and strategic goals. This plan is a companion document to the NASA Enterprise Architecture (EA) and has been developed as a mechanism for documenting the NASA CIO's execution strategy.

This IRM Strategic Plan impacts the entire Agency. It encompasses the full spectrum of information resource management across the Agency, including business and administrative systems, mission specific systems, office automation, IT infrastructure and telecommunications, information security, privacy, and records management. Within NASA, information technology has always been a critical enabling element of program development and management, as well as a pathway for improving business functions.

Information and information technologies are crucial to achieving NASA's strategic goals. Therefore, IT projects must be aligned with the Agency's strategic direction and business plans in order to realize the value of each investment and take advantage of the opportunities that new information technologies promise. This plan directly supports the

Agency Strategic Plan by clearly linking IRM strategies to the NASA vision, mission, strategic goals, and implementing strategies. Figure 1 illustrates the relationship of the IRM Strategic Plan to the NASA Enterprise Architecture and other Agency-level plans.

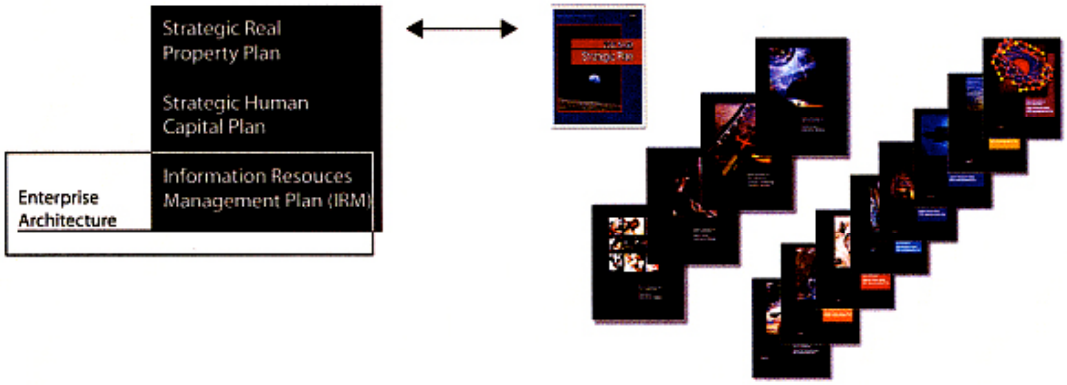

Figure 1

There must be alignment with the Agency's mission, program, and business needs, Government-wide architectures and standards, as well as alignment with our strategic and industry partners. This provides for greater interoperability, efficiencies, and quality of service. It is essential that IT projects are planned and managed in a manner that integrates with mainstream Agency processes, including program/project management and budget processes. The objectives, strategies, and performance measures defined in this plan provide the mechanism for ensuring that IRM decisions are integrated with organizational planning, budget, procurement, financial management, human resources management, and program decisions.

IRM Strategic Goals

The IRM Strategic Plan is intended to serve as an overall roadmap that will guide the Agency in using the NASA Enterprise Architecture as a framework for strengthening the management of NASA's information technology resources through achievement of the following strategic goals:

1. Provide an IT infrastructure that can evolve and adapt to emerging technologies and service models;
2. Optimize investments in mission and program-unique IT systems by utilizing common infrastructure tools and services where practical;
3. Provide a mission and customer focus to the provisioning of common IT services across NASA;
4. Protect and secure the Agency's information assets;
5. Maintain an Agency-wide IT investment portfolio in alignment with mission and business needs; and
6. Maintain a strong IT workforce through effective human capital management.

In accordance with the Office of Management and Budget (OMB) Circular A-130, the IRM Strategic Plan supports the Agency's strategic direction. Table 1 provides a mapping of the Agency goals to the information technologies used to achieve the Agency goals.

NASA's goal is to ensure mission support in the area of IRM sufficiently enables the Agency's mission. The Agency has established a strategic management framework that employs lean governance; responsibility and decision-making at the appropriate levels within the Agency; sensible competition; balance of power; and checks and balances that ensure healthy Centers and a successful Agency.

The IRM strategic goals, outlined above, not only address direct support for mission goals through the development and operation of mission support and mission-specific IT systems, but are also key to the successful execution of the programs and projects as controlled by NASA's Strategic Management Framework. Strategic management of information and information technology is a critical component of NASA's cross-cutting management strategy.

Effectively managing, preserving, protecting, and disseminating the Agency's information across the Agency and external to NASA stakeholders, including the public, is imperative for mission success. To achieve the objectives for the strategic management of information and information technology as defined in the 2006 NASA Strategic Plan, NASA will:

- Evaluate the Agency's information solution and service needs required for mission success against the current state by using the NASA Enterprise Architecture, identify any gaps, and formulate concepts and opportunities to fill the gaps;
- Apply best practices and portfolio management in the selection of initiatives and projects for information solutions and services that best meet NASA's priorities within resource constraints;
- Ensure cost, schedule, and performance success of initiatives and projects for information solutions and services by applying Agency policies and best practices for program and project management; and
- Protect the confidentiality, integrity, and availability of information and information systems based on the categorization of the information processed by, or stored within, NASA's information systems.

These guiding principles for information and information technologies support the Agency's strategic goals as outline below.

- Strategic Goal 1: Fly the Shuttle as safely as possible until its retirement, not later than 2010.
- Strategic Goal 2: Complete the International Space Station in a manner consistent with NASA's International Partner commitments and the needs of human exploration.

- Strategic Goal 3: Develop a balanced overall program of science, exploration, and aeronautics consistent with the redirection of the human spaceflight program to focus on exploration.
- Strategic Goal 4: Bring a new Crew Exploration Vehicle into service as soon as possible after Shuttle retirement.
- Strategic Goal 5: Encourage the pursuit of appropriate partnerships with the emerging commercial space sector.
- Strategic Goal 6: Establish a lunar return program having the maximum possible utility for later missions to Mars and other destinations.

Table 1: The Importance of the use of information technologies in Achieving Agency Goals

Achieving Agency Goals	Requires a Skilled Workforce Unencumbered by Physical Location	Enabled with the Right Capabilities	Provided by a Robust Tool Set	That can be used with consistent inter-operability	And Supported by a Strong IT Foundation	Built on Sound Investment Practices
Strategic Goal 1: Fly the Shuttle as safely as possible until its retirement, not later than 2010. Strategic Goal 2: Complete the International Space Station in a manner consistent with NASA's International Partner commitments and the needs of human exploration. Strategic Goal 3: Develop a balanced overall program of science, exploration, and aeronautics consistent with the redirection of the human spaceflight program to focus on exploration. Strategic Goal 4: Bring a new Crew Exploration Vehicle into service as soon as possible after Shuttle retirement. Strategic Goal 5: Encourage the pursuit of appropriate partnerships with the emerging commercial space sector. Strategic Goal 6: Establish a lunar return program having the maximum possible utility for later missions to Mars and other destinations.	Anywhere, anytime, access to information and people: • Virtual teaming • Collaboration • Mobile workforce	Device independent messaging Boundary-less access to resources for NASA and its partners. Knowledge capture, presentation sharing, and re-use	Electronic Work Environment (EWE) that includes: • Integrated email and calendaring; • email storage, search, and retrieval; • Instant messaging; • Secure messaging; • Wireless access; • File sharing; • Web-based conferencing; • Extensible Markup Language (XML) Repository	Consistent Network Security Perimeter (NSP): On demand secure connections between working groups across Centers and partners with: • Common data interchange formats • Common encription tools	WAN with guaranteed performance and reliability Agencywide Account Management: • Simplified log-in and password • Management—fewer passwords • Convenient and effective method for granting and removing resource access Identity Management System: • Agencywide directory	Standards and Architecture Capital Planning and Investment Control (CPIC) Program and Project Process Cost Schedule Performance Agreement (CSPA)

IRM Strategic Goals

IRM Strategic Goal 1
Provide an infrastructure that can evolve and adapt to emerging technologies and service models.

This goal aligns with the following Strategic Management Framework element from the 2006 NASA Strategic Plan:

> ***Evaluate the Agency's information solution and service needs required for mission success against the current state by using the NASA Enterprise Architecture, identify any gaps, and formulate concepts and opportunities to fill the gaps;***

Background:

Until recently, the NASA IT infrastructure has evolved with little explicit Agency-wide strategic direction. As computing, networking, and communications technologies advanced, IT remained relatively decentralized within NASA. Each NASA Center developed and maintained its own architecture and optimized locally to support individual program/project and Center needs.

The Agency operating model now requires increased capability to work across Centers, generating many requirements that, by their nature, are best met at the Agency or Federal level. In addition, as the e-Government (e-Gov) initiatives progress, the capacity to share information and tools across the Agency and the entire Federal Government will continue to grow. NASA must be positioned to provide an appropriately secure and efficient interface to government agencies and/or application service providers delivering these services, as well as partners utilizing the services. As an Agency, NASA must be prepared with an infrastructure that enables the deployment of Agency-wide services and eliminates the need for application owners and service providers to negotiate multiple agreements.

Overarching Objectives
- Complete and utilize the NASA Enterprise Architecture to realize maximum results;
- Facilitate the deployment of Agency-wide services; and
- Enable effective and efficient integration with e-Gov initiatives.

Strategies
- Manage the Agency's IT infrastructure as an integrated architecture that reflects the needs of the Agency's workforce and incorporates technology innovation;
- Establish a management model and governance that defines and aligns responsibility, authority and accountability for all IT investments

• Review existing Center and Agency applications and services to identify opportunities for increased use of Agency-wide shared services and expansion of partnerships built through existing e-Gov agreements to obtain services through other agencies; and
• Focus on using existing systems, built separately by Centers, and molding those into an integrated infrastructure that allows for services provided by any of the following approaches, as appropriate:
    • Centrally managed and provisioned
    • Centrally managed and locally provisioned
    • Locally managed and provisioned.

Implementation Goal: Institutionalize the use of the NASA Enterprise Architecture for ensuring NASA has the proper information solutions and services for mission success.

Implementation Objectives:

- Implement NASA policies and procedures for use of the NASA Enterprise Architecture. Update the NASA Enterprise Architecture Volumes on an annual basis and have them signed by the NASA Administrator.
- Train and certify representatives from NASA Centers and Mission Directorates in Federal Enterprise Architecture.
- Build out the NASA Service Reference Model.
- Establish and track metrics to assess the effectiveness of the NASA Enterprise Architecture and processes. Conduct Independent Validation and Verification of EA Program.

Measure	Target
Governance framework in place for the NASA Enterprise Architecture	Up-to-date policies and procedures in place for use of the NASA Enterprise Architecture, with EA Volume updates reviewed and approved by NASA Senior Management and signed by the NASA Administrator.
Percentage of Enterprise Architects certified in "Federal Enterprise Architecture."	FY-07 Plan: Q1: 50% of Enterprise Architects. Q3: 75% of Enterprise Architects FY-08 Plan: Q4: 100 percent of Enterprise Architects
Number of EA reviews conducted for NASA major IT investments	25 EA reviews conducted on major IT investments by Q2 FY 2007
OMB assessment of Enterprise Architecture Completion, Use and Results	Meet or exceed President's Management Agenda Scorecard criteria for maintaining Green -Q1-FY07: EA Governance and Management – Target 4.0 -Q1-FY07: Federation of Enterprise and Segment Architecture – Target 5.0 -Q2- FY07: EA Deployment – Target 5.0 -Q2-FY07: CPIC Integration – Target 4.0 -Q3-FY07: IT Implementation Improvement – Target 4.0

IRM Strategic Goal 2

Optimize investments in mission and program unique IT systems by utilizing common infrastructure tools and services where practical.

This goal aligns with the following NASA Strategic Management Framework element from the 2006 NASA Strategic Plan:

> ***- Apply best practices and portfolio management in the selection of initiatives and projects for information solutions and services that best meet NASA's priorities within resource constraints;***

Background:

To accomplish the Vision for Space Exploration, the Agency relies on four Mission Directorates. These Mission Directorates comprise the structure for achieving NASA's mission goals. The mission areas around which these directorates are structured are:

Science
Aeronautics Research
Exploration Systems
Space Operations

To accomplish their missions, these Directorates use a combination of general purpose, multi-program/project, and program unique IT systems. The more that programs and projects can rely on existing infrastructure and tools to perform their missions, the less the risk of using programmatic funding to build duplicate or overlapping systems. However, the NASA CIO is responsible for ensuring that all Directorates and offices throughout the Agency can take full advantage of common infrastructure tools and services. Programs and projects need to know they can rely on the infrastructure services to be available when they need them, and to understand how to ensure that new program/project requirements are incorporated into plans for enhancing the infrastructure.

Overarching Objectives

- Create an Information Resources Management strategy aligned with program and mission needs;
- Provide an appropriately secure and highly reliable infrastructure; and
- Provide common services that enable greater knowledge management and information sharing.

Strategies

- Expand CIO insight, coordination, and participation in mission support and mission specific IT investment decisions;
- Participate in review of acquisition strategy for all major acquisitions;
- Provide information tools, services, and guidelines that enhance operational support to programs and management;
- Increase the performance and stability of the NASA communication infrastructure;

• Deploy tools that facilitate collaboration and information sharing across Centers; and
• Establish and maintain a mechanism to ensure the alignment of IRM priorities with mission and business requirements.

Implementation Goal:
- Ensure information solutions within the NASA Enterprise Architecture Portfolio Elements are appropriately robust, secure, reliable, accessible, cost-effective, and interoperable. The ten NASA Portfolio Elements are: Wide Area Networks (WAN), Local Area Networks (LAN), Voice Communications, Video Communications, Computing Engine, Desktop Hardware and Software, Data Centers, Application Services, Messaging and Collaboration, and Public Web Services.

Implementation Objectives:
-Ensure the NASA Network Backbone and IT workforce are positioned to route IPv6 data packets no later than June 1, 2008.
-Improve the appropriately secure accessibility to the NASA network from remote locations.
-Provide appropriately secure communications between Centers to enable enterprise information solutions, such as Integrated Enterprise Management Program (IEMP) applications and collaborative engineering tools.
- Improve the capability for inter-Center sharing of electronic information across Center LANs.
- Ensure appropriate bandwidth through the LAN to individual desktops to support mission-enabling applications, such as collaborative engineering, desktop video and VoIP.
- Significantly improve overall LAN security.
- Ensure upgrades/replacements to telephone systems at each Center are designed with interoperability and cost-effectiveness in mind.
- Ensure that the convergence of video on NASA networks is designed with interoperability and cost-effectiveness in mind.
- Improve and standardize the provisioning of desktop hardware and software to a greater degree to improve interoperability, security posture and response, and to reduce costs associated with managing desktop computer services.
- Ensure all NASA Data Centers meet industry best practices for backup, recovery, load balancing, access, security, etc.
- Gain a better understanding of data center services, unit costs, performance metrics, etc. and implement customer-focused measures to providing data center services.
- Implement an Agencywide Messaging and Calendaring solution for NASA that improves collaboration across Centers, reduces operating costs, and improves IT security posture, including continuity of operations.
- Provide a common infrastructure that centrally hosts at least 80 percent of NASA's web content to improve information management, service availability, continuity of service, IT security, and reduce cost of hosting and administering multiple web servers at the local level.
- Build out the NASA Data Reference Model to improve information utilization and management.

Measure	Target
Migration of NASA Public Content to the Portal Infrastructure	Transfer public content that is generating 80 percent of the public traffic into the Portal Infrastructure by 4Q FY 2007.
Capability of NASA network backbone and IT workforce to handle IPv6 data packets	For the NASA network backbone to be routing IPv6 data packets no later than June 30, 2008 Q1-FY07 – IPv6 DHCP, NTP, and DNS services established and tested Q3-FY07 – Develop standards and structure for IPv6 address allocation Q1-FY08 – Ipv6 addresses configured in devices Q4-FY08 – NASA's WAN, Center LAN backbones and peering points operating in dual stack mode
Migration of NASA users to a common Agency Messaging solution	50 percent of NASA Centers by Q3 FY 2007 100 percent of NASA Centers by Q3 FY 2008

IRM Strategic Goal 3

Provide a mission and customer focus to the provisioning of common IT services across NASA.

Background:

To enable the NASA workforce to achieve Agency mission and business objectives, the IRM strategy must include providing that workforce with the information infrastructure and tools that adapt and evolve to support management, decision making, science, research, and technology programs and eliminate the barriers caused by "single solution" systems. This infrastructure must be flexible to support a variety of tools and a wide range of customers while providing secure and reliable user access to information and communications in any manner required.

Overarching Objectives

- Enable NASA workforce to work and communicate across an integrated infrastructure;
- Ensure availability of common services across all Centers; and
- Provide the tools needed to support the NASA workforce regardless of location.

Strategies

- Implement standards-based services in the context of an overarching architecture;
- For Agencywide IT services, establish service level agreements that specify milestones, funding, deliverables, and metrics;
- Implement a communication infrastructure in alignment with NASA EA to ensure commonality of service availability for selected Agency-wide services;
- Focus on results through improved accountability for service delivery through performance measures, including customer satisfaction;

• Deploy Agency-wide IRM customer satisfaction survey and develop action plans for improving performance in areas falling below specified thresholds;
• Investigate new and innovative IT technologies and develop a process for integration into the Agency service suite; and
• Establish a mechanism for ensuring the NASA workforce is aware of and trained to use available tools and services.

Measure	Target
Customer satisfaction	-Establish baseline customer satisfaction levels by Q2 FY 2007 -Improve customer satisfaction levels to acceptable levels by Q4 FY-2008 (at least 75 percent satisfied or highly satisfied)
Service level agreements in place for Agency-wide services	100% by 4Q FY2007
Information Management Capability	- Q4-FY07: NASA Taxonomy developed - Q4-FY07: Policy and procedural requirements approved for Information Management - Q2 FY07: 20% of Scientific and Technical Information digitized - Q4 FY07: 35% of Scientific and Technical Information digitized

IRM Strategic Goal 4

Protect and secure the Agency's information assets.

This goal aligns with the following NASA Strategic Management Framework element from the 2006 NASA Strategic Plan:

> ***Protect the confidentiality, integrity, and availability of information and information systems based on the categorization of the information processed by, or stored within, NASA's information systems.***

Background:

As stated in the NASA Strategic Plan, "***One of NASA's most valuable assets is the Agency's accumulated base of technical and scientific knowledge and information generated by NASA's research, science, engineering, technology, and exploration initiatives. Technology has increased the amount of information that NASA programs can produce, analyze, store, and interpret.***"

NASA's information assets include not only the products of the knowledge generation process, but the systems that are used to manage, disseminate, and preserve the

information created by that process. Protection of those assets (availability, integrity, and confidentiality) must be a critical component of the Agency's IRM strategy.

Overarching Objectives
• Provide an appropriately secure and integrated IT infrastructure to the NASA workforce;
• Monitor and evaluate compliance with Agency policies and Federal regulations; and
• Improve timeliness in meeting milestones for corrective actions as identified in the Federal Information Security Management Act (FISMA) report.

Strategies
• Identify and systematically correct vulnerabilities;
• Define and ensure compliance with Agency Network Security Perimeter reference architecture;
• Deploy an Agency-wide directory to provide a single authoritative source for authenticating personnel into NASA systems;
• Establish a centrally provisioned system for managing accounts across NASA;
• Develop Center "scorecards" to track progress toward meeting Agency and Government-wide security requirements; and
• Establish an architecture for the management of NASA's information assets.

Implementation Goals:
- Ensure information technology security is incorporated throughout the system life-cycle.
- Reduce vulnerabilities and costs associated with managing identity, authorization, and access to NASA information systems
- Appropriately harden systems against compromise of confidentiality, integrity and availability
- Ensure the appropriate protection of personally identifiable information

Implementation Objectives:
-Develop and implement NASA policies and procedures that will ensure IT security is incorporated throughout the system life-cycle.
-Require and ensure certification and accreditation (C&A) of all information systems in accordance with National Institute of Standards and Technology (NIST) Special Publication 800-37.
- Develop a common infrastructure for identity and account management.
- Effectively implement Public Key Infrastructure (PKI) across NASA.
- Implement 2-factor authentication for access to NASA systems.
- Appropriately harden systems against compromise of confidentiality, integrity and availability
- Implement and ensure effective operating system configurations, vulnerability scanning and patch management.
- Develop Agency policies and procedures governing the appropriate use of personal information and implementing privacy controls.

- Monitor the implementation of privacy controls and measure their efficacy
- Through education, awareness, and role-based training, ensure managers and users of personal information are made aware of the privacy risks associated with their activities and of applicable laws, policies, and procedures related to privacy.

Measure	Target
Percentage of systems certified and accredited	4Q FY 2007: 100% of NASA systems with a current Authorization to Operate (ATO)
Number of Agency-wide applications using common infrastructure for identity, account management, and authentication	50% of applicable HIGH systems by 4Q FY2007 100% of applicable HIGH systems by 4Q FY 2008 100% of applicable MODERATE systems by 4Q FY 2009 100% of applicable LOW systems by 4Q FY 2010
Percentage of systems in compliance with operating system benchmarks	100% of non-waived systems by 4Q FY 2007
Efficacy of privacy controls	-Procedural requirements approved by Q2-FY07 -Privacy impact assessments completed for 100% of applicable systems (on-going target) -Annual notification to employees of privacy responsibilities – Q3 FY07

Strategic Goal 5

Maintain an Agency-wide IT investment portfolio in alignment with mission and business needs and ensure proper management of investments within the portfolio.

This goal aligns with the following NASA Strategic Management Framework elements from the 2006 NASA Strategic Plan:

> ***Apply best practices and portfolio management in the selection of initiatives and projects for information solutions and services that best meet NASA's priorities within resource constraints;***
>
> ***Ensure cost, schedule, and performance success of initiatives and projects for information solutions and services by applying Agency policies and best practices for program and project management;***

Background:

NASA's IRM strategic goals must be both economically and technically achievable. NASA has several missions which present "Grand Challenges" to the IT industry and academia. These challenges raise visionary perspectives of capabilities that are addressed through research and development programs within NASA or elsewhere. However, the investment portfolio for IT systems for day to day conduct of our business and mission functions must be constructed recognizing that constrained resources and prudent management call for utilization of technically proven and cost effective solutions.

To that end, in all architectural and investment decisions, NASA will always address these key questions:
-What are the strategic objectives of the Agency?
-What information is needed to support the Agency, its partners, and the general public?
-What applications and services are needed to provide information?
-What technologies are needed to support the applications and services?
-What and how will data be captured, stored, searched, and disseminated?

Overarching Objectives
• Ensure investment decisions reflect optimal use of available funds and other limited resources such as human capital, facilities, and existing or related capital investments;
• Integrate the Capital Planning and Investment Control (CPIC) process with the Agency's overall budget process; and
• Manage IT investments using Agency standard program/project management practices, including periodic review of cost, schedule, and performance data.

Strategies
• Focus on areas or information needs with the highest potential for advancing long-term Agency goals;
• Develop conceptual models to facilitate discussion and support quantitative analysis for business case development;
• Work with Office of Procurement to ensure integration and alignment of investment decisions with procurement policy and guidance;
• Ensure all investments are aligned with NASA EA "to-be" state and compliant with NASA Program and Project Management procedural requirements;
• Establish process that includes approval of Mission Directorate CIOs, Mission Associate Administrators, and the NASA CIO for significant mission specific investments; and
• Review/approve Center-specific IT plans and budgets as part of Agency budget process.

Implementation Goals:
-Ensure all programs/projects that contain major information technology investments prepare an adequate IT Business Case.
- Institutionalize the use of NASA project management discipline and best practices for programs and projects with IT elements.

Implementation Objectives:
-Ensure a passing score is achieved on OMB Exhibit 300 Business Cases based on alignment with mission objectives, sound project management, risk, cost-benefit analysis, IT security, and other factors.
-Monitor Business Case metrics and update the business cases quarterly.
- Ensure NASA policies and procedures adequately require the use of project management discipline for IT-related projects.

-Develop Project Management Handbook for IT Projects, including best practices, considerations, applicable standards, review requirements, and templates for review packages.
-Develop and implement training module for NASA project management training/certification relative to IT project management requirements.

Measure	Target
Percentage of qualifying investments with an approved business case	100% of new investments
Percentage of investments compliant with NASA Project Management procedures	100% of new investments

IRM Strategic Goal 6

Maintaining a strong IT workforce through effective human capital management.

Background:

A strong IT workforce is a critical enabling element for accomplishing the Agency's strategic goals. This is true not only because IT is such an integral part of virtually every NASA program and project, but also because reliable and responsive IT systems are a fundamental requirement for the successful day to day operation of the Agency. These tools provide many of the primary communication mechanisms both within and between NASA installations and are the method of choice for storing and retrieving science, engineering, research, and management information. This inherent dependence on IT systems for all aspects of mission success drives a corresponding dependence on a highly skilled IT workforce.

NASA has made human capital management a shared responsibility of organizations at all levels, and has developed the Strategic Human Capital Plan (SHCP) to assure an integrated, systematic, Agencywide approach to human capital management.
As described in the NASA Strategic Plan, one of the Agency's core values is our people. NASA recognizes the importance of maintaining a team of highly qualified individuals to perform the Agency's important work and achieve mission success. The Agency's SHCP and related Human Capital Management Implementation Plan (HCMIP) describe how we will build and maintain this extraordinary team through specific strategies for attracting, hiring, retaining, and continually developing a worldclass workforce. In line with the NASA values and strategies outlined in the Strategic Plan, SHCP, and HCMIP, the CIO has adopted specific objectives and strategies for developing and maintaining a strong and viable IT workforce.

Overarching Objectives
- Recruit and retain a talented, diverse workforce
- Develop and maintain competency in IT project management

• Establish an effective process for developing the next generation of leaders in the NASA IT community

Strategies

• Work with the Office of Human Capital Management, the Mission Directorates, the Centers, and other functional offices to identify issues and provide guidance and direction related to management of human capital with respect to the IT workforce;
• Establish requirements for the management of IT projects that align with NASA standard program and project management processes and are compliant with Federal CIO Council guidance;
• Provide training and/or other developmental opportunities to ensure technical and project management skills are developed and maintained;
• Provide developmental opportunities that enable potential future leaders in the NASA IT community to acquire a broad perspective of the customer needs across the Agency's Mission Directorates and mission support organizations; and
• Explore new university and industry partnerships/alliances to provide additional hands-on opportunities for the next generation IT workforce.

Measure	Target
Percentage of Project Managers validated according to Federal CIO council guidelines	100% validated for major IT investments
Number of Center IT professionals completing developmental assignments in the office of the NASA CIO	Four each fiscal year
Percentage of System Administrators certified in Systems Administration	100% by Q4 Fy-07
Percentage of NASA personnel that have completed IT Security Training	100% by Q4 Fy-07

Appendix 1:

Summary of Performance Against Previous NASA IRM Strategic Plan

(Against March 2006 IRM Strategic Plan)

Goal	*Performance Measure*	*Target*	*Actual Result*
Provide an infrastructure that can evolve and adapt to emerging technologies and service models	Governance framework in place for the NASA Enterprise Architecture	Policies and procedures in place for the use of the NASA EA. EA volumes reviewed and approved by NASA Senior Management and signed by the Administrator	NASA Policy Directive (NPD) 2830.1, NASA Enterprise Architecture, and NASA Procedural Requirements (NPR) 2830.1, NASA Enterprise Architecture Procedures were developed and implemented effective December 16, 2005 and February 9, 2006, respectively. The NASA Enterprise Architecture version 4.0 was signed by the NASA Administrator in October 2005.
	Percentage of EA representatives trained and certified in "Federal Enterprise Architecture"	FY-06: 50% FY-07: 75% FY-08: 100%	A total of 20 NASA civil servants (12) and support contractor personnel (8) received Federal Enterprise Architecture Certification in FY-06, which surpassed the goal of 5 certifications in FY-06.
	Maturity of NASA Service Reference Model	NASA Service Reference Model to be under configuration control by October 2006.	The NASA SRM was placed under configuration control as of March 2006.
Optimize investments in mission and program unique systems by utilizing common infrastructure tools and services where practical	Migration of Public Content to the Portal Infrastructure	Transfer public content that is generating 80 percent of the public traffic into the Portal infrastructure by Q4 FY 2007	Directive has been issued to require all new web sites to be stood up on the Portal infrastructure. All existing sites with public content will be identified by Jan 2007, with those generating 80 percent of traffic migrating to the Portal by October 2007.
	Completion of the WAN Upgrade within performance, cost, and schedule targets	Meet all performance goals – cost, schedule within 10% of plan.	The new WAN was implemented July 2006 under cost and within 10% of schedule baseline, and provides a 1000% increase in capacity over the previous architecture.
Provide a customer focus to the provisioning of common IT services across NASA	Customer satisfaction	75% satisfied or above	Deployment of Agency has survey slipped. Currently scheduled for Q1 FY-07. Customer satisfaction for users under the Outsourcing Desktop Initiative for NASA

			(ODIN) exceeds 90% at satisfied or above.
	Percentage of selected Agency services supported at all Centers	100% by 4Q FY-2006	-Patch management services were successfully deployed and utilized at all Centers -NASA directory services deployed and supported at all Centers -Common badging and access control system supported at all Centers -InsideNASA portal is supported by all Centers -E-training (SATERN) services supported at all Centers
Protect and secure the Agency's information assets	Percentage of systems certified and accredited	100% of NASA systems with a current Authorization to Operate (ATO)	Over 90% of NASA systems are operating with a current ATO
	Number of Agency applications using common infrastructure for identity, account management and authentication	50% by 4Q FY-2007	NASA is on track to meet milestones identified in its HSPD-12 Implementation Plan.
	Percentage of systems compliant with operating system benchmark configurations	100% by 4Q FY 2006	94% of applicable systems are compliant with benchmarks
Maintain an Agency-wide IT investment portfolio in alignment with mission and business needs and ensure proper management of investments within the portfolio	Percentage of qualifying investments with an approved business case	100% of new investments	NASA's business cases for major investments were approved by OMB as of March 2006
	Percentage of investments compliant with NASA Project Management procedures	100% of new investments	All new investments conform to NASA project management procedures for project reviews and success criteria to progress to subsequent phases.
Maintaining a strong IT workforce through effective human capital management	Percentage of Project Managers validated according to Federal CIO Council guidelines	100% validated for major IT investments	All Project Managers for NASA's major IT investments have been validated for FY-2006
	Number of Center professionals completing developmental assignments in the office of the NASA CIO	Average of one per quarter each fiscal year	Average for FY-2006 was one per every 2 quarters.
	Percentage of System Administrators certified in Systems Administration	100% by Q4 FY 2006	All system administrators have completed certification in Systems Administration in order to meet NASA standards.