



## REVISION HISTORY

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# **I. Introduction**

The NASA XML Project is a part of the NASA Integrated Information Infrastructure Program (NI3P), which is under the management of the NASA Chief Information Officer (CIO). The Program will provide the NASA workforce with information infrastructure and tools that adapt and evolve to support management, science and technology programs, and will eliminate the barriers caused by standalone systems. This document describes how the NASA XML Project will be managed in conformance with NASA NPG 7120.5b, Program/Project Management.

## **I.1 Background**

As documented in the NASA XML Business Case, government, industry, and academia are all embracing XML as a technology that will assist in the sharing and reuse of information. Virtually all major software vendors including IBM, Microsoft, Sun, SAP, Oracle, and Software AG have made XML important parts of their product offerings.

The Office of Management and Budget has included XML as a key technology in the Federal Enterprise Architecture (FEA). Since agency Enterprise Architectures must align with the FEA, NASA must include XML as part of its infrastructure capabilities.

XML has been so widely adopted because it is an open standard and is relatively simple to learn and use. It provides a self-describing way of labeling both text and data. XML allows information content to be processed with very little human involvement and exchanged across diverse computer hardware, operating systems, and applications. These capabilities are extremely valuable to an organization like NASA that has diverse missions, works with many external partners, and by necessity must use computer hardware and software supplied by many different vendors. While XML is used in many applications not related to the Web, the value of XML will continue to grow as Web Services become an increasingly important tool for conducting business.

The reader is referred to the NASA XML Business Case for a complete discussion of the external and internal factors that are driving the Agency to adopt XML.

## **I.2 Scope**

The scope of this project plan includes all the activities documented in the NASA XML Business Case.

## **I.3 Related Documents**

NASA XML Business Case, Version 1, dated June 11, 2003

NPD 7120.4            Program/Project Management

NPG 7120.5B        NASA Program and Project Management Processes and  
Requirements

NPG 2800.1        Managing Information Technology

NPG 2810.1        Security of Information Technology Handbook, Revision A  
9/26/1999

NPG 8000.4        Risk Management Procedures and Guidelines, Effective Date:  
04/25/02

NASA XML Working Group Charter

14 CFR Part 1203    Information Security Program

40 U.S.C. 1401 et seq Clinger-Cohen Act of 1996, the Information Technology  
Management Reform Act, Division E of Pub. L 104-106

NASA Integrated Information Infrastructure Program Plan of July 2, 2003

PCA    NASA IT Security

Federal XML Developer's Guide, April 2002, US Federal CIO Council, Architecture and  
Infrastructure Committee, XML Working Group

## **I.4 Order of Precedence**

In the event of a conflict between the text of this Project Plan and an applicable document cited herein, the text of this Project Plan takes precedence.

All specifications, standards, exhibits, drawings or other documents that are invoked as “applicable” in this Project Plan are incorporated as cited. All documents that are referred to by an applicable document are considered to be for guidance and information only.

## **II. Objectives**

This project supports the goal of the NASA Integrated Information Infrastructure Program -- provide the information systems and technologies that enable anywhere, anytime access to information and people. Enabling consistent implementation of agency-wide services and applications is fundamental to providing the information systems and technologies that enable anywhere, anytime access to information and people.

The specific objectives of the NASA XML Project are to:

- Provide to NASA programs and projects the tools, mechanisms, and assistance they need for discovery of XML-related information in order to increase re-use of information and interoperability of information systems
- Increase awareness of and share lessons learned about XML and XML-related technologies
- Provide training to Agency developers on specific aspects of XML-related technologies
- Provide to the NASA CIO recommendations for Agency XML-related policies and standards.
- Coordinate Agency XML Communities of Interest.

## **III. Customer Definition and Advocacy**

The Project Manager will ensure that customers are an integral part of the Project throughout its life cycle in order to clarify requirements and ensure customer satisfaction with delivery of quality services within budget and schedule. Customers for the NASA XML Project include the Agency’s XML application and web developers, the programs and projects that currently utilize XML and XML-related technologies, and programs and projects that could benefit from XML technologies but need assistance in understanding it’s the resulting benefits and issues before doing so. The project will involve its customers, including XML practitioners at all levels, through outreach via the NASA XML Working Group as well as through information disseminated via web sites and the Enterprise and Center CIOs.

Advocacy is the responsibility of the NASA CIO and the NASA Deputy CIO for Information Management, with support of Center and Enterprise CIOs. The NASA CIO also serves as the primary liaison for coordination with other Federal agencies and providing information to the Congress, OMB, and other stakeholders.

## **IV. Project Authority**

The NASA Chief Information Officer is responsible for ensuring that the Integrated Information Infrastructure Program meets externally mandated requirements while satisfying internal customer needs in a cost effective manner and complies with the Agency Enterprise Architecture. The CIO has primary responsibility and authority and is the approving official for the Program.

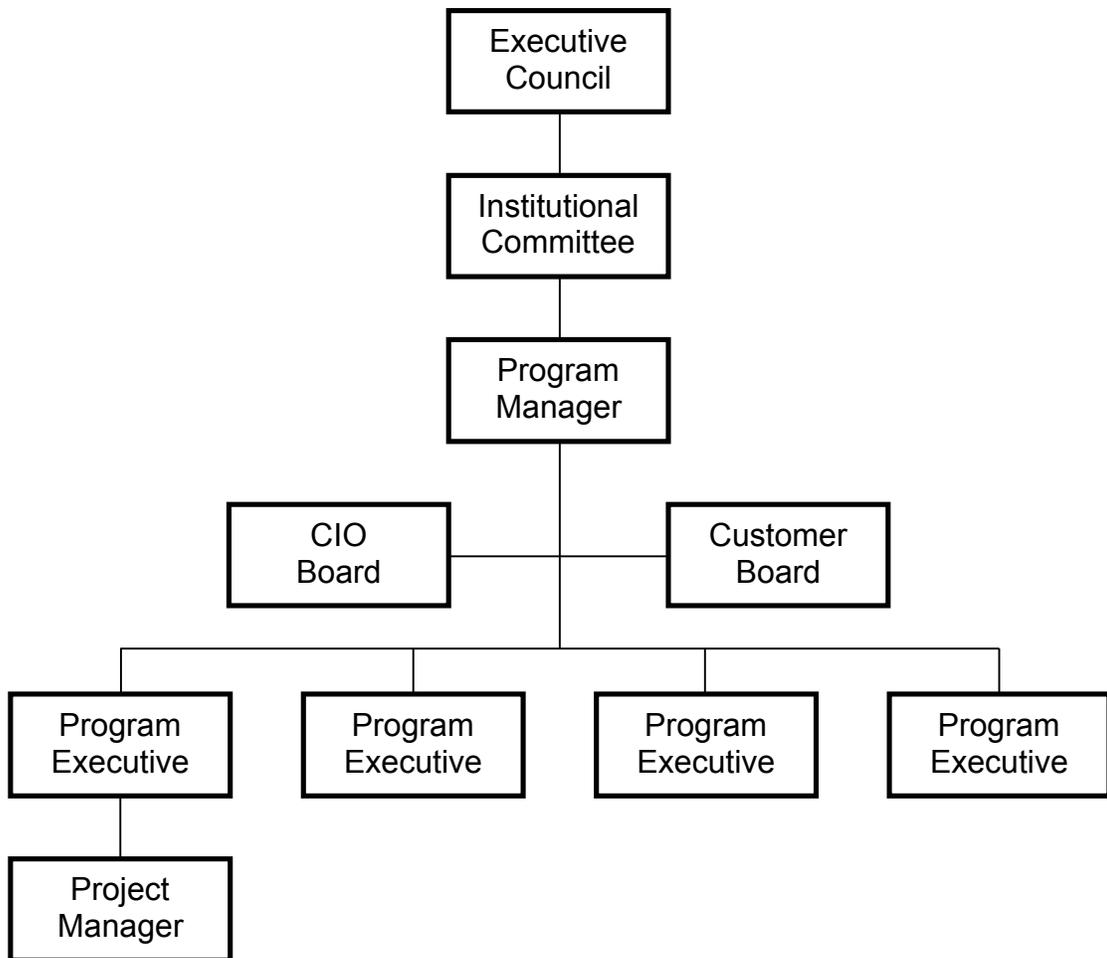
The CIO has also designated a Program Executive for each of the projects within the program and established a management structure to ensure an effective implementation, oversight and review. The Program Executives report directly to the NASA CIO. As such, the Agency CIO authorizes the NASA XML Project. The Project Manager is the lead for the implementation, integration, and transition to operations.

The project will develop an addendum to attach to the Program Commitment Agreement (PCA), which outlines its specific technical performance, schedule, and resource commitments.

## **V. Management**

This section describes the organizational structure of the NI3P (including generic organizational roles and responsibilities) and of the NASA XML Project. Figure V-1 illustrates the organizational structure of the NI3P. Specific roles, responsibilities, processes and procedures for the NI3P will be defined in the CIO Management Plan, to be developed upon approval of the CIO Management Model. Figure V-2 illustrates the organizational structure of the NASA XML Project.

**Figure V-1: NASA Integrated Information Infrastructure Program Functional Organization**



## **V.1 Organization & Responsibility**

The CIO has designated a Program Executive for each of the functional areas within the Program and has established a management structure to ensure an effective implementation, oversight and review. The Program Executives report directly to the NASA CIO.

### **V.1.1 CIO Board**

The CIO Board, comprised of all the Enterprise and Center CIOs, will act as a forum for reviewing Program structure and integration issues. The Council will recommend actions to the Program and/or Project Manager as appropriate.

### **V.1.2 Customer Board**

This board is made up of representatives from all major customer groups. The Board will ensure alignment of CIO priorities with programmatic and institutional needs.

### **V.1.3 Program Manager**

The Program Manager has lead responsibility for program management. The Program Office has responsibility for implementing the Program in accordance with the Program Plan, the approved PCA, and the individually approved Project Plans. Specific responsibilities include:

- Setting objectives and requirements
- Setting scope, priorities, and controls module sequencing and timing
- Soliciting proposals for and approving subordinate projects
- Managing Program budget
- Allocating funding to projects
- Establishing framework for conducting program business within the Program Management Plan
- Managing Program Level risks
- Reporting (PMC, Process Owners, OMB, Congress, GAO, Office of the Inspector General (IG))
- Assessing Program performance
- Remaining accountable to customers for Program performance

### **V.1.4 Program Executive**

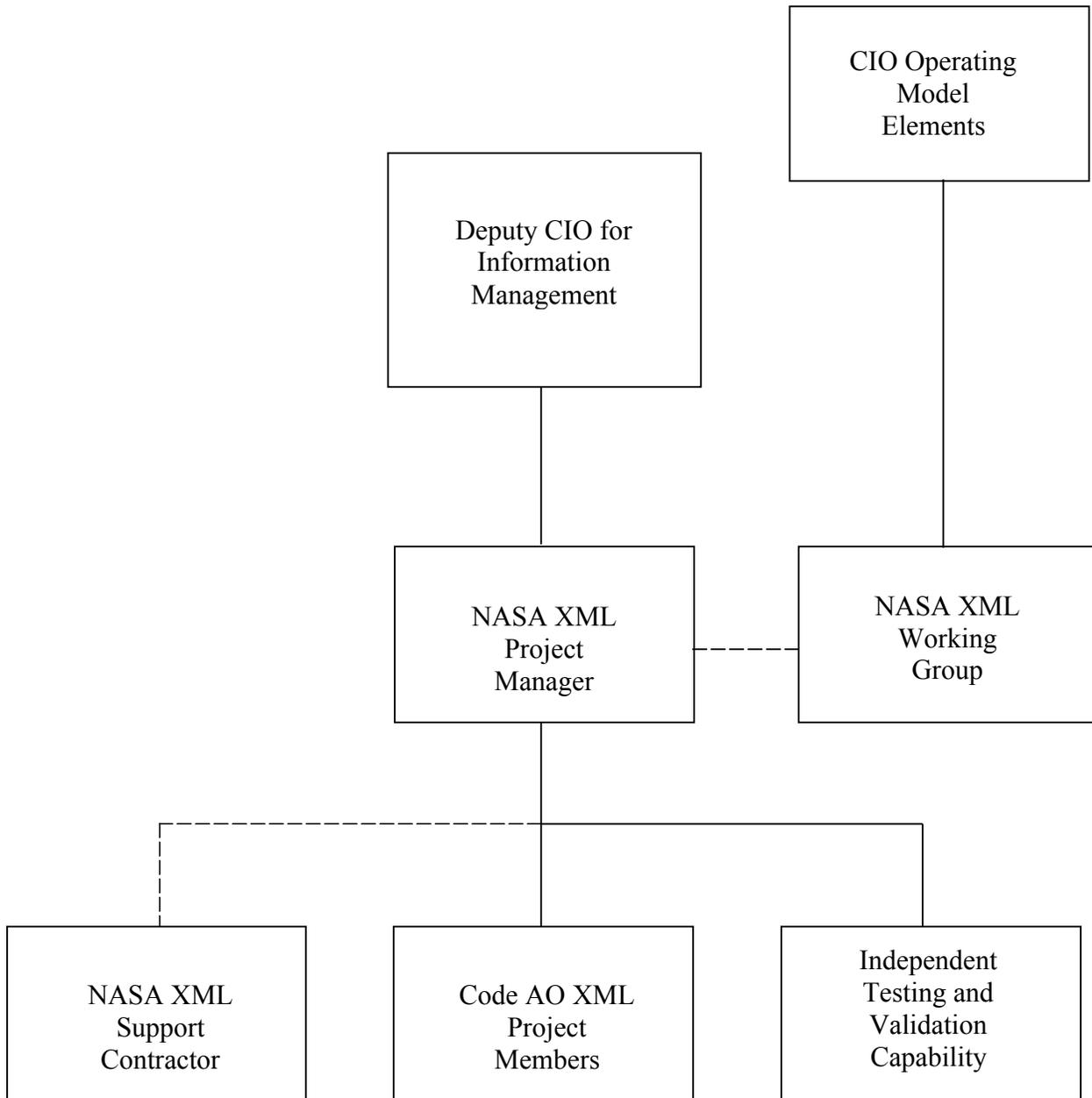
The Program Executive is the interface between the Program Manager, the CIO Board and the Project Team. The Program Executive will provide overall direction, control, and oversight of project implementation, including review of project performance, schedule,

and cost status. The Deputy CIO for Information Management is the Program Executive for the NASA XML Project.

### **V.1.5 Project Manager**

The Project Manager is responsible for the overall management of the project and has the responsibility to ensure each phase of the project is implemented in the most expeditious and cost-effective manner. This individual has the authority to approve principal project documents, contract and performance reports, and content for upper level status briefings. The Project Manager receives technical assistance from a support contractor and oversees its work. The Project Manager oversees a Project Team that includes the Office of the NASA CIO-assigned civil service staff and its support contractors, as well as the civil service and support contractor staff of the Independent Testing and Validation capability, once established.

**Figure V-2: NASA XML Project Organization**



## **V.1.6 NASA XML Working Group**

The charter of the NASA XML Working Group is to advance the productive use of XML technology within NASA. The scope of the Working Group includes all aspects (mission, engineering, and administrative applications) of XML within NASA. The Working Group's functional scope includes planning/policy, standards, security, and outreach activities related to XML. All NASA Centers and many programs and projects participate in the NASA XML Working Group in order to provide technical recommendations to the Office of the CIO, share lessons learned, and otherwise assist in making XML and related technologies more useful technologies within the Agency. The NASA CIO appoints the chair(s) of the NASA XML Working Group.

## **VI. Technical Summary**

The activities conducted under the NASA XML Project will assist the NASA CIO in formulating NASA-wide policy on XML technologies and in developing a strategic vision. The project will deliver recommendations for appropriate uses of XML, assist in the creation and registration of XML artifacts, facilitate communication among NASA communities of interest and external standards bodies, and work with other Federal Government agencies toward common Government-wide goals. The project will also provide mechanisms for data gathering, web site development, product evaluations, training, logistical support and many other activities. Any activity that is associated with realizing the benefits of XML technology within NASA is within the purview of this project.

### **VI.1 *Project Requirements***

The desired outcome of the NASA XML project is to increase the effective use of XML technologies within NASA, in order to help realize the benefits of these technologies as well as to ensure compliance with new Federal regulations. The requirements for the project are driven by requirements both external and internal to the Agency. The external requirements are driven by the Federal-level changes mandated by the Office of Management and Budget (OMB) and the increasing use of XML by our partners and by Information Technology (IT) vendors' products. XML is directly responsive to the President's Management Agenda mandate to better share information among government bodies at all levels. The requirements internal to the Agency reflect the need to be more efficient and effective in the way that NASA manages its information. The NASA XML Business Case documents in detail the external and internal factors requiring the adoption of XML within the Agency.

### **VI.2 *System Operation Concept***

The NASA XML Project described in this plan will not result in the development of a system, but rather in the delivery of a set of services and capabilities. The only system planned for use in this project is the Department of Defense (DOD) XML Registry. This system is operated by the Department of Defense for the use of its constituent components and for NASA. The operational aspects of this system are out of the scope of this project plan. Also, the project will stand up an Independent Testing and Verification capability which, while not a system per se, will require development of operational concepts and procedures that will be included in that activity.

### **VI.3 System Architecture**

The product of the NASA XML Project will not be a specific system or application. Rather, it will result in a collection of recommendations, guidelines and procedures based on existing and developed components. The recommendations will include advising the Agency on how to leverage the standards, protocols, vocabularies, and best practices that comprise XML technology as it stands today. Architectural components such as World Wide Web Consortium (W3C) Schema, Web Services Definition Language (WSDL), and Unified Modeling Language (UML), and protocols such as Simple Object Access Protocol (SOAP), and XML Metadata Interchange (XMI) are just a few examples of key components that will be evaluated and considered for Agency use during this project. Nevertheless, wherever pertinent, sound system engineering principles will be followed when developing project products.

If tasked to do so, the NASA XML Working Group will assist in defining the XML infrastructure portion of the NASA Enterprise Architecture under the direction of the Enterprise Chief Architect. Linking its missions and programs to an overall IT strategy, the NASA Enterprise Architecture will support NASA's strategic enterprises, infrastructure, and internal operations, and will allow the Agency to provide services to citizens in diverse business areas. Moreover, the NASA Enterprise Architecture will be consistent with the goals of the Federal Enterprise Architecture, an initiative led by OMB that is based on a common set of reference models.

The Technical Reference Model (TRM), one of five interrelated reference models comprising the Federal Enterprise Architecture framework, will provide input for the NASA XML project. The TRM, first released in June 2003, is a hierarchical foundation that describes how technology is supporting the delivery of the service component. The TRM outlines the technology elements that collectively support the adoption and implementation of component-based architectures.

The recommendations of the NASA XML project will also be guided by another reference model of the Federal Enterprise Architecture, the Data and Information Reference Model (DIRM). The DIRM will describe, at an aggregate level, the data and information that support program and business line operations. The model will aid in describing the types of interaction and exchanges that occur between the Federal Government and its various customers, constituencies, and business partners. The DIRM is scheduled for release in the summer of 2003.

## **VI.4 System Constraints**

One important aspect of this project will be the submission and retrieval of XML-related information into and from the DOD registry. The design, capabilities, rules, policies, and processes associated with the registry have been established by DOD and represent constraints on the project. It is not clear at this time whether or not this registry, as it now exists, will meet the evolving XML needs of NASA programs. The project is treating the use of the DISA XML Registry as a risk. Please reference the risk management plan for the planned mitigation approach for this risk.

Another primary constraint on the NASA XML Project is the requirement to be consistent with the goals of the Federal Enterprise Architecture (via the reference models described above) and the E-Gov act of 2002. The NASA Enterprise Architecture, now being developed, will also constrain this project, since it is important that all aspects of the NASA Integrated Information Infrastructure conform with the architecture.

## **VI.5 Facilities**

The two ongoing facilities required by this project include the DoD XML registry and the NASA Video Teleconferencing Services (ViTS) rooms that will be used extensively by the XML Working Group meetings. The project will also stand up a web site in support of the NASA XML Working Group.

In FY05 the project will initiate an effort to create a facility for the testing and integration of XML-related products in support of the entire NASA XML community and in support of development of NASA technical standards. Just as the duplicative testing and evaluation of workstation software and hardware once performed by many NASA Centers was replaced by an Agency-wide capability, NASA will stand up an Agency-wide XML support capability that answers the collective needs of individual Centers, programs, and projects. This centralized capability will not preclude testing and integration by individual initiatives to meet their specialized requirements.

## **VI.6 Logistics**

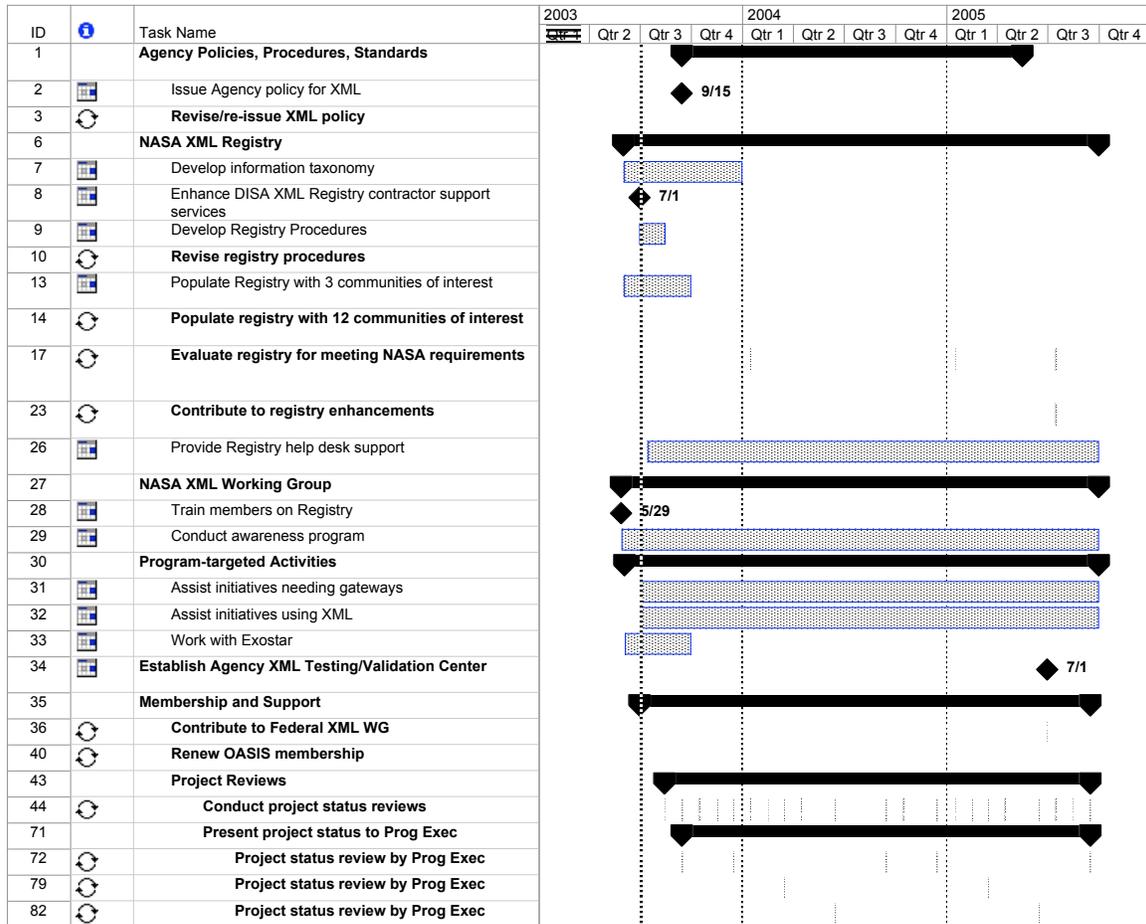
Logistical activities will consist primarily of: XML Working Group meetings, training of NASA personnel, attending conferences and meetings of the Federal XML Working Group. Help desk activities in support of registry usage also represent an important logistical component. Operational procedures for the help desk will be developed as part of this project

## **VI.7 Mission Results Analysis and Reporting**

Not applicable.

## VII. Schedule

Following is the draft schedule for the NASA XML Project. Schedule baselines will be established once the project is approved for implementation.



## **VIII. Controls**

### **VIII.1 Overview**

The NASA XML Project will institute appropriate controls for the project that are in conformance with those of the NI3P. These controls will ensure robust configuration management and active performance measurements to provide a sound level of assurance.

### **VIII.2 Configuration Management**

The NASA XML Project will institute a configuration management process that conforms with that of the NI3P. Key project products that will require configuration management include, among others:

- Agency level XML policies, procedures, and standards
- NASA-specific operating procedures for the NASA XML Registry
- NASA requirements documents for the NASA XML Registry
- The NASA information taxonomy
- The NASA XML Working Group Charter
- Project outreach documents (including training material)
- NASA XML web site content, per Agency requirements.

The XML Registry has in place a mechanism for configuration management of the XML artifacts it contains. The project will analyze this mechanism and supplement it as needed for NASA's specific needs, and include the final process as part of the project configuration management documentation.

## **IX. Implementation Approach**

### **IX.1 Agency-level XML Policies/Procedures/Standards**

This project will develop Agency level policy, procedure, and standards recommendations for the procurement and use of XML and XML-related technologies. The NASA XML Working Group, the NASA Webmasters Working Group, and other pertinent Agency technical groups will be invited to participate in the drafting of these recommendations. Recommendations will follow the approval process described in the CIO Management Model. All standards recommendations will conform to the NASA Enterprise Architecture.

### **IX.2 NASA XML Registry**

The NASA XML registry will evolve to be the authoritative source for generation and reuse of XML metadata components for the Agency's mission, engineering, and administrative. By using information stored in the registry, the Agency will gain improved interoperability among Agency software systems that use XML natively or via gateways, and better support Agency initiatives.

The Agency has entered into an agreement with the Department of Defense (DOD) to use the XML registry created by the Defense Information Systems Agency (DISA). As part of this agreement, the Agency has provided funding to enhance the DISA XML registry contractor support services. The Agency will contribute to functional improvements of DISA XML registry capabilities that map to the Agency's requirements. As NASA gains experience in its use, the Agency will decide whether or not to continue using the DISA XML registry depending upon how well it meets the Agency's evolving requirements, including those for security.

This project will also sponsor the development of a NASA information taxonomy and limited set of XML schema for use with the XML registry. The NASA information taxonomy will assist in classifying information and defining the NASA namespace in the XML registry.

This effort will develop NASA-specific procedures and documentation for use of the DISA XML registry. The policies and procedures documents will address all key elements of registry use, including configuration management and security of the information stored in the registry. The procedures will be based upon those already in use by DOD and will be modified to reflect NASA's specific needs.

This project will provide technical consultation assistance to NASA communities of interests in populating the XML registry with XML artifacts. Rudimentary help desk support will be provided to answer NASA-specific questions about use of registry.

On a semi-annual basis, the project will evaluate how well the XML Registry is meeting NASA's requirements. The project will make recommendations to NI3P management for changes to NASA's use of the registry based on the annual analyses. Possible changes include: requesting changes to the structure of the registry, switching to another registry, or, as a last resort, sponsoring the development of a NASA-specific registry.

### **IX.3 NASA XML Working Group**

The charter of the NASA XML Working Group is to advance the productive use of XML technology within the Agency. The scope of the Working Group includes all aspects (mission, engineering, and administrative applications) of XML within the Agency. The Working Group's functional scope includes planning/policy, standards, security, and outreach activities related to XML.

The NASA XML Working Group is led by a Chair appointed by the NASA CIO, and includes a Center-specific representative from all Centers, including Headquarters and JPL, as well as Enterprise representatives. Representatives from many NASA programs, projects, and initiatives (including IFMP) also are members. Other interested parties, such as contractors, may join but are non-voting members.

DISA has provided training on the DISA XML registry to the NASA XML Working Group. Training materials will be available via the Web for subsequent self-instruction. The NASA XML Working Group will assist in conducting Agency-wide XML training and awareness. The NASA XML Working Group will provide recommendations for the XML infrastructure portion of the NASA Enterprise Architecture under the direction of the Enterprise Chief Architect.

#### **IX.4 Agency-wide XML Training and Awareness**

Agency-wide XML awareness and skills training will be conducted with the assistance of the NASA XML Working Group and via other capabilities. The project will provide training on the use of the XML registry to anyone in NASA wishing to submit artifacts to or search the registry.

User surveys and needs analysis of the NASA communities of interest will be conducted to assist in providing the appropriate level of training and awareness. The surveys will evaluate the sharing of interoperability, reuse, and security best practices, as well as information on the Agency's XML infrastructure developed and implemented as part of the NASA Enterprise Architecture. Based on the results of the surveys, more details on the specifics on the training and awareness will be included in updates to this Plan.

#### **IX.5 Program-targeted XML**

The NASA XML project team will identify and conduct discussions/technical analyses with initiatives that may need to interface with XML infrastructure through gateways or other means. Planning and limited technical analysis will be provided to these initiatives that may not be able to or want to use XML as their native format.

The project will identify and conduct discussions/technical analyses with initiatives that should be encouraged to contribute to the NASA XML Registry. Surveys will be done with the existing community of XML users to evaluate the benefit of their contributing to NASA XML Registry, and prioritize/schedule submission of their XML information.

Technical consultation support will be provided to programs/projects/initiatives in populating the XML Registry. The support will include assistance in analyzing their data, moving it to the XML Registry, and promoting its reuse.

The project web site will contain a section that tracks XML usage within specific programs, sharing the lessons learned with the entire user community.

In FY 2003, the project will work with Exostar to understand the technical and management aspects of its online Aerospace and Defense trading exchanges. The Exostar solution is based on XML and will be analyzed for lessons learned in areas such as standards, implementation planning, and security that be useful to NASA. Further information about Exostar may be found at: <http://www.exostar.com/>.

## **IX.6 Memberships and Support**

NASA recognizes the need to partner with and participate in the XML-related activities of external organizations in order to advance the use of this technology within the Agency. For example, in FY 2003, NASA made a contribution to the Federal XML Working Group that has sponsored work that is intended to lead to a federated XML Registry capability. This is important work that will benefit NASA but that NASA cannot perform by itself. NASA has also joined the Organization for the Advancement of Structured Information Standards (OASIS) in order to participate in and influence the development of open XML-related standards. NASA is also a member of the Object Management Group (OMG), which is a source of both Unified Modeling Language (UML) and many XML standards. A Space Domain Task Force at OMG is now working on XML schema. On an annual basis, this project will recommend to the NASA CIO similar contributions and memberships, as appropriate.

## **IX.7 Project Summary Work Breakdown Structure**

Following is the summary Work Breakdown Structure for the NASA XML Project:

### **1. NASA XML**

**1.1 Program/Project Plans**

**1.2 Reviews**

**1.3 Fiscal Management**

**1.4 Performance Metrics Collection and Analysis**

### **2. Agency-level XML Policies/Procedures/Standards**

**2.1 Acquisition-related policies/procedures/standards**

**2.2 Development-related policies/procedures/standards**

**2.3 NASA information taxonomy**

**2.4 Independent testing and validation capability**

### **3. NASA XML Registry**

**3.1 Obtain Registry capabilities**

**3.2 Configure Registry for NASA use**

**3.3 Develop/publish procedures/documentation for NASA use of Registry**

**3.4 Provide user support for Registry**

**3.5 Populate Registry with NASA XML artifacts**

**3.6 Evaluate Registry for meeting NASA requirements**

**3.7 Contribute to registry improvements**

#### **4. NASA XML Working Group**

**4.1** Constitute NASA XML Working Group

**4.2** Provide administrative support for NASA XML Working Group

**4.3** Conduct NASA XML Working Group Meetings

**4.4** Develop NASA XML Working Group Work Products

#### **5. Agency-wide XML Training and Awareness**

**5.1** Conduct Agency-wide XML Training/Awareness Needs Study

**5.2** Develop XML Training/Awareness Material

**5.3** Deliver XML Training/Awareness

#### **6. Program-targeted XML**

**6.1** Identify Initiatives/Programs

**6.2** Coordinate Strategy for Use/Non-use of XML

**6.3** Provide Technical Consultation in Use of XML

#### **7. Memberships and Support**

**7.1** Identify/Review Organizations to Join/Support

**7.2** Enter into Membership/Support Agreement

## **IX.8 Transition to Operations**

Since this project does not result in the delivery of an operational system, there are no activities associated with a transition to system operations per se. The NASA XML Registry is already in the operational phase and supported by DISA. However, once the Independent Testing and Validation capability is stood up, there will be a transition to operations of that facility. Transition plans will be prepared as part of its implementation.

## **X. Acquisition Strategy**

Acquisitions made as part of this project are anticipated to be limited to Commercial Off-The-Shelf (COTS) software packages and a very small number of servers and workstations for the agency-wide testing and validation capability (FY 2005). Existing contracts will provide the necessary contractual vehicles for these products as well as support contractor services. Augmentations to the XML Registry will be accomplished via inter-agency agreement with DISA or another Federal agency if the DISA XML Registry does not meet our needs.

## **XI. Project Dependencies and Agreements**

The project relies on an inter-agency agreement with DISA to provide XML Registry services. The use of the DISA XML Registry is dependent upon the continuation of this agreement. Additionally, the transfer of funds to GSA for the Federal XML Working Group is via an agreement with GSA. Participation in OASIS is via membership in that organization.

The primary vehicle for ongoing participation by the NASA technical community in the NASA XML Project is via the NASA XML Working Group. The continued viability and productivity of the Working Group is important to the success of the project.

## **XII. Performance Assurance**

The following performance measures will be tracked to ensure project performance:

- Number of submissions to the NASA XML Registry
- Number of communities of interest submitting artifacts to the NASA XML Registry
- Number of subscriptions to artifacts in the NASA XML Registry (indicating usage of the artifacts)
- Number of inquiries to the NASA XML Registry
- Number of individuals participating in the NASA XML Working Group
- Customer satisfaction surveys conducted to determine degree to which user community is satisfied with XML support at Agency level

- Number of visitors to the NASA XML Working Group Web site
- Number of XML-based applications implemented by members of the XML Working Group (will be tracked on Web site).

In addition, the Office of the Chief Information Officer will utilize existing governance bodies to provide feedback and suggestions for improvements.

## **XIII. Risk Management Plan**

### **XIII.1 *Introduction***

This risk management plan will direct the processes, methods, and tools used to manage risks associated with the NASA XML project

### **XIII.2 *Purpose and Scope***

The purpose of this risk management plan is to ensure that all significant risks that may impact the successful implementation of the NASA XML Project are identified and mitigated to the extent feasible.

### **XIII.3 *Overview Process***

There are four primary activities performed in the risk management process:

- a. **Identification of risks:** a continuous effort to identify and document risks as they are found.
- b. **Analysis of risks:** an estimation of the probability of risks occurring and the impacts they would have if they should occur
- c. **Planning for mitigation of risks:** an effort on a risk-by-risk basis to decide how to disposition risks, and what, if any, risk mitigation steps will be enabled
- d. **Tracking and controlling risks:** collection of and reporting status information about risks and their mitigation plans (where appropriate) and taking corrective actions.

### **XIII.4 *Organization***

While all project team members have some degree of responsibility for risk management, the NASA XML Project Manager owns all risks associated with this project. All project team members, including the support contractor staff, have the responsibility to identify risks, to perform an initial analysis to characterize risks, and to communicate risk information to the Project Manager.

### **XIII.5 *Process Details***

The process details for the NASA XML Project risk management plan are described below.

### **XIII.5.1 Analyzing Risks**

Following receipt of risk information from the party identifying the risk, the Project Manager will assign to a team member the responsibility for analyzing the risk and developing a recommendation to the Project Manager for risk mitigation.

### **XIII.5.2 Risk Responsibility**

The Project Manager will approve or direct changes to the risk analysis and mitigation recommendation. The Project Manager will determine whether or not to keep the risk within the project or transfer responsibility for the risk (via negotiations) to another organization outside the project. Risks kept within the project will be assigned to someone within the project for action. For each risk, a decision is made to determine whether the risk requires further research, is accepted (the acceptance rationale is documented in the project files), is tracked, or mitigated (create a mitigation plan, assign actions, and monitor the plan and the risk).

### **XIII.5.3 Tracking and Control of Risks**

All risks will be centrally managed and controlled by the NASA XML Project Team via spreadsheets. The person assigned responsibility for the risk will provide periodic status reports to the Project Manager. The Project Manager will report risks and risk mitigation status to the NI3P Program Executive per program requirements.

### **XIII.5.4 Summary of Methods and Tools**

A spreadsheet will be used to track risks and risk status. Summary information about project risks will be provided to the NI3P Program Executive using methods and tools specified by the program.

### **XIII.6 Resource and Schedule**

The existing project budget includes funds associated with mitigating risks recognized at the time of approval of this project plan. If additional risks are identified requiring supplemental funding for mitigation, the I3P Program Executive will be notified.

### **XIII.7 Documentation of Risks**

All risks will be documented and tracked as described above. Project archive documentation will include risks that have been retired.

### **XIII.8      *Current Risk Inventory***

Figure XIV-1 below analyzes the current risk inventory associated with the activities described in this plan, as follows:

- The risk is described
- The probability of the risk occurring (without mitigating actions) is characterized as high, medium, or low
- The severity of impact (without mitigating actions) that would occur if the risk is realized is characterized as high, medium, or low
- The importance of the risk (without mitigating actions) is characterized by factoring in the probability of the risk occurring and the severity of the impact if the risk is realized
- Mitigating actions that are planned to reduce the probability of the risk occurring and/or to minimize its impact if the risk is realized are described
- The residual importance of the risk after mitigating actions is characterized as high, medium, or low.

The risk inventory will be updated as new risks are identified as described in the risk management plan.

**Figure XIV-1: Risk Analysis**

<b>Risk</b>	<b>Probability</b>	<b>Impact</b>	<b>Importance</b>	<b>Mitigation</b>	<b>Residual Importance</b>
<b>Risks related to recommended investments in an XML Registry</b>					
NASA may not be able to continue using the DISA Registry because it is not adequate for our needs. Initial experience with the registry indicates it may have shortcomings	M	H	H	<ul style="list-style-type: none"> <li>• DISA will train NASA on the use of the registry so that we fully understand its capabilities</li> <li>• DOD has levied the requirement on its XML developers to use the registry and we can expect that registry shortcomings will be addressed to meet DOD (and thereby) NASA needs</li> <li>• NASA participates in the DISA Registry governance process and so can influence needed registry changes</li> <li>• Individual users of the DISA Registry are invited to submit feedback. All suggestions are logged into a database and are reviewed at the beginning of each development cycle.</li> <li>• This plan budgets funds for</li> </ul>	M

Risk	Probability	Impact	Importance	Mitigation	Residual Importance
				<p>enhancement of the DISA Registry to meets our needs.</p> <ul style="list-style-type: none"> <li>• The NASA XML Project Plan will include discrete milestones for formally reviewing the Registry’s capabilities vs. NASA’s requirements and determining whether NASA should continue to use the DISA Registry or follow a different approach.</li> <li>• If all else fails, NASA can move its XML data to the Federal CIO Council registry now under development and will still benefit from the experience gained using the DISA Registry</li> </ul>	

<b>Risk</b>	<b>Probability</b>	<b>Impact</b>	<b>Importance</b>	<b>Mitigation</b>	<b>Residual Importance</b>
<p>NASA may not be able to continue using the DISA Registry because DOD closes its use to non-DOD organizations. This could occur either due to security or other policy considerations</p>	L	H	M	<ul style="list-style-type: none"> <li>• NASA will continue to participate in the DISA Registry governance process and so we expect to have early warning of such a policy change, along with time to migrate to another registry.</li> <li>• NASA can move its XML data to the Federal CIO Council registry now under development and will still benefit from the experience gained using the DISA Registry</li> <li>• This plan budgets funding for upgrades to the DISA Registry which we would shift to another registry if unable to use the DISA Registry.</li> </ul>	L

<b>Risk</b>	<b>Probability</b>	<b>Impact</b>	<b>Importance</b>	<b>Mitigation</b>	<b>Residual Importance</b>
NASA may not be able to continue using the DISA Registry because OMB requires civil agencies to use CIO Council registry	L	H	M	<ul style="list-style-type: none"> <li>• NASA continues to work closely with the OMB Federal Enterprise Architecture Program Management Office and with the Federal CIO Council. We expect to receive early warning and time to transition our data to another registry if OMB made such a decision</li> <li>• This plan budgets funding for upgrades to the DISA Registry which we would shift to another registry if unable to use the DISA Registry.</li> </ul>	L

<b>Risk</b>	<b>Probability</b>	<b>Impact</b>	<b>Importance</b>	<b>Mitigation</b>	<b>Residual Importance</b>
<p>A significant percentage of NASA initiatives using XML may not contribute their XML data to the registry or utilize artifacts submitted by others. This may be due to perceived lack of value of the registry to the initiatives, issues with the registry's design/implementation, or lack of resources/time to populate the registry.</p>	M	H	H	<ul style="list-style-type: none"> <li>• DISA will train NASA on the use of the registry so that we fully understand its capabilities</li> <li>• Ensure that the registry meets NASA requirements by making necessary investments or migrating to another registry.</li> <li>• Ensure that NASA policies and procedures are responsive to the Agency XML communities' needs and are streamlined for efficiency</li> <li>• Provide contractor support to initiatives to provide further training and consulting assistance in using and populating the registry</li> <li>• Build a strong NASA XML Working Group of Agency practitioners that conveys the XML communities' needs to the Office of the CIO and the Agency's needs to the XML community.</li> </ul>	M

Risk	Probability	Impact	Importance	Mitigation	Residual Importance
<b>Risks related to the use of or failure to use XML within the NASA IT infrastructure</b>					
<p>NASA initiatives not using XML as a native capability may refuse to use XML or be unable to interface with the Agency XML infrastructure due to resource, schedule, technical, or other considerations. The result would be lack of compliance with the President's Management Agenda, reduced Agency interoperability/stovepipe implementations, and unnecessary duplication of effort in defining and describing important Agency data.</p>	H	H	H	<ul style="list-style-type: none"> <li>• Educate the NASA community on the mandates included in the President's Management Agenda and in the FEA concerning interoperability and the use of XML</li> <li>• Put in place Agency policies regarding the use of XML consistent with Federal level mandates</li> <li>• Provide contractor consulting assistance in analyzing how to best interface with the Agency's XML infrastructure</li> <li>• Include initiatives in the NASA XML Working Group and in related governance activities so that their requirements and issues are understood and addressed</li> <li>• Establish a Web site that collects information about</li> </ul>	H

Risk	Probability	Impact	Importance	Mitigation	Residual Importance
				<p>XML use within NASA, to help groups that are not presently using XML to understand both the requirements and benefits of using XML, and to provide resources that would help them get started.</p> <ul style="list-style-type: none"> <li>• Share via the Working Group best practices, vendor product evaluations, and technical approaches</li> </ul>	

<b>Risk</b>	<b>Probability</b>	<b>Impact</b>	<b>Importance</b>	<b>Mitigation</b>	<b>Residual Importance</b>
<p>Agency XML efforts may not be consistent with the NASA Enterprise Architecture, leading to a mismatch between the Agency's business requirements for XML and its XML infrastructure which supports those requirements</p>	L	H	M	<ul style="list-style-type: none"> <li>• Both the NASA Enterprise Architecture effort and the Agency XML efforts described in this document will be led by the Office of the CIO, and will be closely coupled</li> <li>• The NASA XML Working Group will assist in defining the XML infrastructure portion of the NASA Enterprise Architecture under the direction of the Enterprise Chief Architect</li> </ul>	L

Risk	Probability	Impact	Importance	Mitigation	Residual Importance
<b>Risks related to XML as a technology</b>					
<p>Security or other concerns may make use of XML problematic for NASA and the benefits anticipated from these Agency investments will not be realized.</p>	M	H	M	<ul style="list-style-type: none"> <li>• NASA will participate in OASIS, other standards bodies, and Federal-level initiatives that are analyzing the technical risks associated with XML and are working to mitigate them</li> <li>• NASA (along with the rest of the Federal Government) will make its XML-related requirements known to the vendor community so that acceptable commercial products are available</li> <li>• XML is a key enabling technology for a broad spectrum of applications in business, scientific, and government arenas. Any security shortcomings discovered will likely be addressed vigorously.</li> <li>• The NASA XML Working Group will share best practices and lessons learned</li> </ul>	M

<b>Risk</b>	<b>Probability</b>	<b>Impact</b>	<b>Importance</b>	<b>Mitigation</b>	<b>Residual Importance</b>
<p>The Federal Enterprise Architecture may change in the short term and require a competing technology to XML and the benefits anticipated from these Agency investments will not be realized. The probability of this risk is rated very low due to the relative maturity of XML and the lack of competing technologies that can approach its capabilities.</p>	L	H	L	<ul style="list-style-type: none"> <li>• The NASA Office of the CIO will continue its strong involvement in the development of the Federal Enterprise Architecture and have early warning concerning any changes to the requirement to use XML</li> <li>• NASA will continue to participate in OASIS and promote standards that will augment the value of XML to NASA and to the Federal Government as a whole; this will also assist NASA in staying current with new technologies so that the Agency will be ready to adopt them should they eventually supplant XML</li> </ul>	L

Risk	Probability	Impact	Importance	Mitigation	Residual Importance
<b>Risks related to the scope of the activities included in this business case.</b>					
<p>The scope of activities proposed for funding in this business plan is very large. Failure to adequately manage and execute these activities will result in wasted investment and opportunity loss associated with unrealized XML benefits for the Agency</p>	M	H	H	<ul style="list-style-type: none"> <li>• Fully fund and support the proposed activities so that the resources needed for their accomplishment can be applied</li> <li>• Apply oversight of the activities and work products via standard Office of the CIO governance and management processes to ensure their quality and timeliness.</li> <li>• Provide yearly (or as needed) updates to this business case to reflect changes to external and internal business drivers.</li> </ul>	M

## **XIV. Environment Impact**

None

## **XV. Safety and Mission Assurance (S&MA) and Security**

This project will put in place policies and procedures to safeguard NASA information and data per the requirements of NPG 2810 and other relevant Agency guidance.

## **XVI. Technology Assessment**

This project will assess on an ongoing basis the usefulness to NASA of emerging XML-related technical standards for adoption as NASA technical standards. The project will also track the implementation of XML registries by other Federal agencies for possible use by NASA. In all cases, the project will emphasize the adoption of open technical standards and approaches whenever feasible.

## **XVII. Commercialization**

There are no expected benefits to the commercial sector as a result of this project.

## **XVIII. Reviews**

The NASA XML Project will conduct periodic internal reviews to ensure that the project is meeting its objectives, on schedule and within budget. The NI3P Program Executive will conduct reviews of this project per program requirements. In addition, as new policies, procedures, standards, and other proposals are developed, the project will submit draft documentation to the appropriate community for review and comment.

## **XIX. Tailoring**

The NASA XML Project and this plan are in compliance with the project management processes and requirements defined in NPG 7120.5b

# Appendices

## Appendix A -- Acronyms and Abbreviations

CIO	Chief Information Officer
DISA	Defense Information Systems Agency
DOD	Department of Defense
DRM	Data Reference Model
ebXML	Electronic Business using eXtensible Markup Language
FTE	Full Time Equivalents
FY	Fiscal Year
GAO	General Accounting Office
GSA	General Services Administration
HTML	Hypertext Markup Language
IFMP	Integrated Financial Management Program
IG	Inspector General
IT	Information Technology
JPL	Jet Propulsion Laboratory
NI3P	NASA Integrated Information Infrastructure Program
NPG	NASA Procedures and Guidelines
OASIS	Organization for the Advancement of Structured Information Standards
OMB	Office of Management and Budget
OMG	Object Management Group
PCA	Program Commitment Agreement
PMC	Program Management Council
S&MA	Safety and Mission Assurance
SOAP	Simple Object Access Protocol
UDDI	Universal Description, Discovery, and Integration (of Web Services)
UML	Unified Markup Language
ViTS	Video Teleconferencing System
W3C	World Wide Web Consortium
WSDL	Web Services Description Language
XMI	eXtensible Markup Language Metadata Interchange
XML	eXtensible Markup Language

## Appendix B – Point of Contact List

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