

IVV 11: Enterprise Architecture (IT Governance) Process

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Purpose

The purpose of this system level procedure (SLP) is to establish a procedure to ensure a consistent method for Information Technology (IT) governance for the NASA IV&V Program and its related business functions.

This SLP outlines the process for identifying, tracking and approving IT changes for a new capability that is outside the scope of a currently provided IT service and/or a change to the "As-Is" IT architecture, or for a new capability or resource to add to a current IT service and network capability that are brought forward by the NASA IV&V Program community. The EAB will serve as a functional component to the NASA IV&V IT infrastructure and related components to ensure the IV&V program is consistent with how it handles IT expenditures/processes and overall governance.

The outcome of SLP IVV-11 process is to answer the questions: who, what, where, why, when, and how. Answering these 6 basic questions will provide the information needed to make an informed decision that is best for the IV&V Program. Through this guided decision-making process, the IV&V Program will be able to meet its strategic goals and objectives with expected outcomes.

Scope

This SLP encompasses IV&V Program functions as they affect and relate to NASA IV&V IT. This includes all facilities/systems and business processes that affect the NASA IV&V Program, including partners, tenants, contractors, and related personnel. The EAB falls under NASA Policy Directive (NPD) 2830.1, *NASA Enterprise Architecture*.

Definitions and Acronyms

Official NASA IV&V roles and terms are defined in the [Quality Manual](#). Specialized definitions identified in this SLP are defined below.

- **Architecture**
 - Architecture is the structure of components, their interrelationships, and the principles and guidelines governing their design and evolution over time.
- **Business Process**
 - A business process is a collection of related, structured activities or tasks that produce a specific service or product (serve a particular goal) for a particular customer or customers. It often can be visualized with a flowchart as a sequence of activities with interleaving decision points or with a Process Matrix as a sequence of activities with relevance rules based on data in the process.
- **Business Requirement**
 - Business requirements are needs that must be fulfilled to achieve a high-level objective.
 - Note: Confusion arises for three main reasons:
 - (1) a common practice is to refer to objectives, or expected benefits, as "business requirements."
 - (2) People commonly use the term "requirements" to refer to the features of the product, system, or software expected to be created.
 - (3) A widely-held model says these two types of requirements differ only in level of detail or abstraction—wherein "business requirements" are high-level and vague and decompose into product, system, or functional requirements that are detailed.
- **Enterprise Architecture (EA)**

- Enterprise Architecture is an explicit description and documentation of the current and desired relationships among business and management processes and information technology. An Enterprise Architecture includes principles, an architecture framework, a technical standards profile, current and target architectures, and a transition strategy to move from the current to target architecture.
- **Enterprise Architecture (EA) “As-Is”**
 - The EA “As-Is” is the set of IT products that outline the existing enterprise, how it meets the IV&V Program goals and objectives and technical infrastructure. It is also referred to as the “As-Is” Architecture, the Baseline Architecture, or the Current Architecture.
- **Enterprise Architecture Board (EAB)**
 - The EAB is a board of NASA IV&V Senior Leadership whose goal is to facilitate cohesion between IT and the IV&V Program, as well as a mapping between IV&V Program goals and objectives and the underlying IT needed to support them.
- **Enterprise Architecture (EA) Official**
 - The EA Official is responsible for defining all of the overall processes and logistics related to EA actions, as well as helping the Initiator of the request to define and direct the EA action.
- **Implementation Team**
 - The Implementation Team is the team that is responsible for implementing EA actions from both feasibility and operational standpoints. This team will perform due diligence before any EA action is approved and will also be responsible for implementing the final solution.
- **Initiator**
 - The Initiator is any individual or group that initiates the request for a new business requirement to be brought before the EAB.

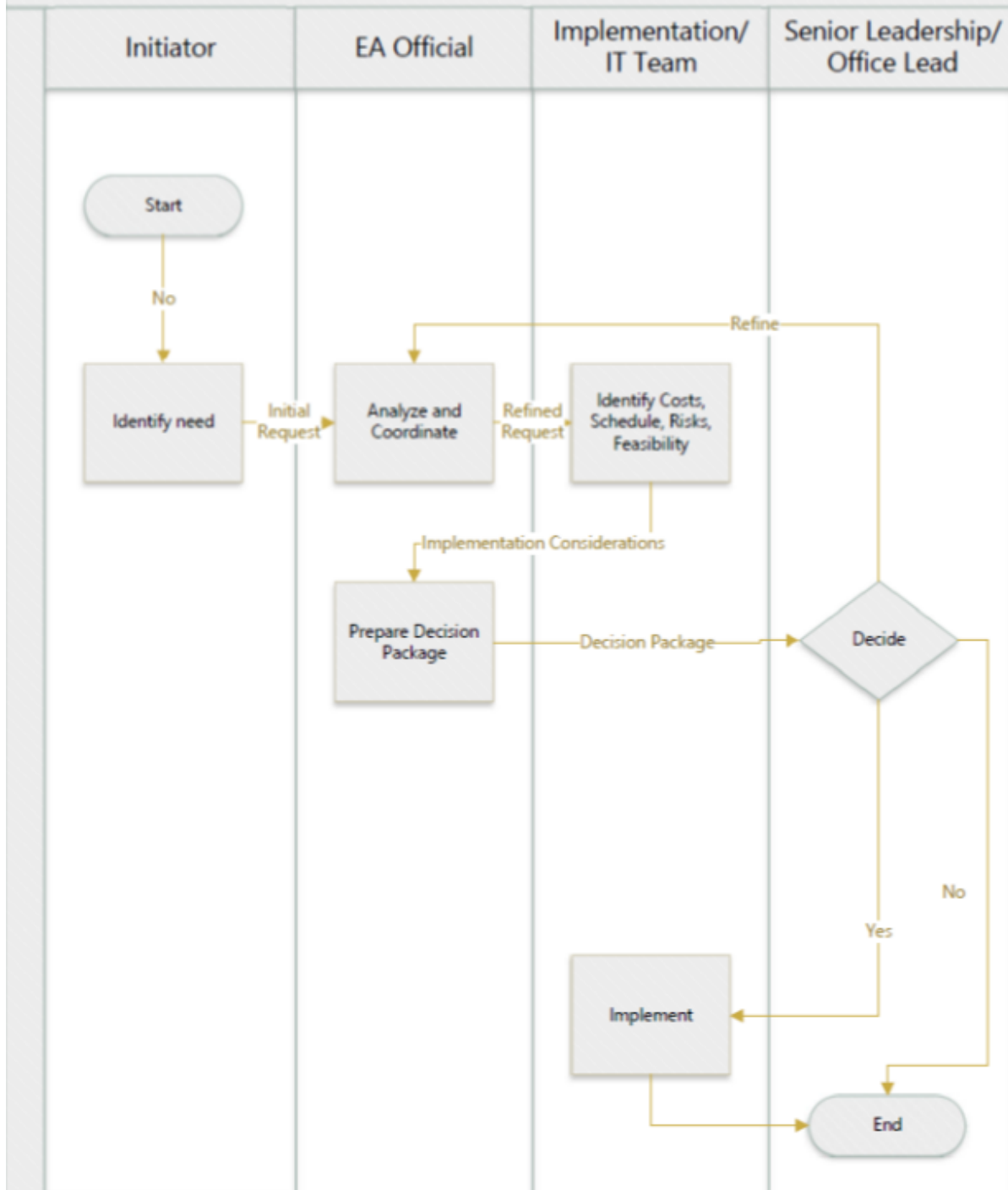
Acronyms

EA	Enterprise Architecture
EAB	Enterprise Architecture Board
GSFC	Goddard Space Flight Center
IMS	NASA IV&V Management System
IT	Information Technology
JSTAR	Jon McBride Software Testing and Research
NODIS	NASA Online Directives Information System
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
QM	Quality Manual
SLP	System Level Procedure
SRM	Service Reference Model
SWAT	Software Assurance Tools

Process Flow Diagram

The following diagram depicts the process described in this document, and the responsibilities and actions that shall be performed by process participants or their designees. Any information supplemental to the depicted process will appear after the diagram.

IT Governance Flow



EA Request Process

The EA request process shall follow the steps below:

Initiator Responsibilities (To answer: Why? What?):

The initiator request shall come in the form of a business justification or statement, and shall be emailed to ivv-dl-it@mail.nasa.gov.

The Enterprise Architecture Information Portal Dashboard provides guidance on submissions including:

- [How to Submit an Idea](#),
- [Enterprise Architecture Overview](#), and
- [Frequently Asked Questions](#)

The Initiator may be directed to the EA Official after having requested a resource per IVV 04, *Program Support Office Services Request Process*, or IVV 20, *NASA IV&V SWAT Request Process*.

EA Official responsibilities (To ensure that all types of questions are answered and documented (Who? What? When? Where? Why? How?):

The EA official has responsibility to ensure that all parties are aware and have knowledge of each request.

To identify the best course of action and to ensure all questions have been answered, the EA Official may set up a meeting with the initiator, appropriate lead, and affected parties.

Methodology for questions:

The purpose of EA at IV&V is to have a governance model to allow for effective and efficient IT services for the IV&V Program. This SLP is written in order to meet objectives which should answer: Who? What? Where? Why? When? and How?

If there is an IT expenditure, then the following elements should be considered:

- Understanding the “Who” element can help ensure that there is inclusion and diversity in the decision-making process and ultimately the final solution for all the rest of the questions.
- Understanding the “What” element is important so that implementation teams (IT, SWAT, JSTAR) can assess the capability effectively and ensure that we are not duplicating services, as well as give the opportunity to those teams to provide advice on implementation, such as “Where” this capability should be implemented.
- Understanding the “Where” element helps us to be efficient and effective at utilizing our current resources. Understanding the answers to the “where” question will also help the organization decide where resources are best suited for the end customer. There is currently a spreadsheet that helps guide us to make these decisions.
- Understanding the “Why” element gives buy-in for the “Who” so that when the how and what are being determined the “Who” all have the same end goal. If there is no clearly defined end goal, then the why is unclear and can never be met effectively.
- Understanding the “When” element helps the organization plan and meet objectives and execution plan milestones effectively. EA usually will do an ROI study on the capability and the overall cost and return on investment for this capability.
- Understanding the “How” element, including how much, gives the organization the ability to plan and prioritize execution for current and out years and adjust resources as needed.

A more detailed set of guiding principles can be found [here](#).

Note: If the capability already exists but the Initiator feels that the resource could be improved, or if the capability doesn't exist, then the EA Official will work with the Initiator to identify what is unique regarding this request and document that for the final review.

Implementation Team/IT Lead responsibilities (To answer: How?):

The EA official will engage the Implementation Team(s)/IT lead asking to understand the cost, schedule, risks, and feasibility of various options to implement the request. Questions that may help guide the decision include:

- Does this action impact other IV&V IT assets in an adverse way?
- Can this action be implemented effectively (with regard to IT security, technology, and other technical considerations) in the current IT environment? (This action is handled by the implementation team[s] and will take considerably longer to answer as there may need to be in-depth analysis in order to answer this question.)
- Does this action follow NASA and Goddard Space Flight Center (GSFC) guidelines (i.e. NPR 2810, 7120.5, 7150)?
- Is this business requirement unique, requiring special attention that cannot be met with the current toolset or IT function?
- Does this IT capability already exist and does it currently fulfill the capability requested?

Senior Leadership/Office Lead responsibilities (To answer: Where? How? Who? When?):

For requests that cannot be resolved within the available budget, priorities, or authority of the TASO, requests may be elevated to the Senior Leadership team to serve as the EAB. There may be a need to have a meeting to answer these questions if this is a Program-level request as opposed to a request for a single office. Questions to help guide the decision include:

- Is there appropriate funding (initial and out-year)?
- Does this action fall within the scope of the NASA IV&V Strategic Plan?
- Is ownership agreed upon by a respective IV&V Office? This would include implementing and maintaining the tools and providing subject matter expertise to support this capability.
- Is there any impact/risks or considerations that may affect other IV&V Program functions or capabilities?
- Where do we plan to extend this IT capability or innovation? (i.e. Is it just something for IV&V internally or is this an externally facing capability? Are there customers involved outside our organization?)
- Why are we doing this? Is this something that is driven by a business need or innovation?
- When do we plan on executing this? This year? Next year? Forever? Short term?

Results and Final Documentation

The EA Official will document the results and capture any notes, meeting minutes, and other pertinent information along with an EA number (EA-###) on the Enterprise Architecture Information Portal Dashboard for major initiatives arising from this process.

The EA Official will send the approval or denial of the request via email.

For EAB meetings, a consensus approach is used to approve or deny proposals.

If there is insufficient information or a disagreement among EAB members, then the EAB must either deny the request or have the Initiator rework the request until agreement can be reached.

All EA documentation (including minutes, decisions, and assessments) will be stored in a centrally shared EA repository for reference and EAB review

Metrics

No formal metrics are associated with this SLP tracked within the NASA IV&V Metrics Program. The Enterprise Architecture Information Portal Dashboard provides some statistical information regarding the various major initiatives.

Records

The following records will be generated or updated and filed in accordance with this SLP and IVV 16, *Control of Records*, and in reference to NPR 1441.1, *NASA Records Management Program Requirements*.

Record Name	Original	Essential	Responsible Person	Retention Requirement	Location
EA Initiatives	Y	N	EA Official	Destroy 7 years after creating a new iteration of the enterprise or information architecture. (02/026.0.D)	EA Repository
EAB Meeting Minutes (Senior Leadership Minutes)	Y	N	EA Official	Destroy 7 years after creating a new iteration of the enterprise or information architecture. (02/026.0.D)	Enterprise Content Management System

Note: The above records taken together may be considered the "Final Documentation". Other records created during this process belong to other groups, (e.g. Implementation Plans would belong to the implementing group.

References

REFERENCES	
Document ID/Link	Title
IVV QM	NASA IV&V Quality Manual
IVV 07	Financial Data Control
IVV 10	Software and Hardware Configuration Management

IVV 16	Control of Records
IVV 20	NASA IV&V SWAT Request Process
NPD 2830.1	NASA Enterprise Architecture
NPR 1441.1	NASA Records Management Program Requirements
NPR 2830.1	NASA Enterprise Architecture Procedures
NPR 7120.5	NASA Space Flight Program and Project Management Requirements
NPR 7150.2	NASA Software Engineering Requirements
https://confluence.ivv.nasa.gov:8445/display/EA	Enterprise Architecture website

If any procedure, method, or step in this document conflicts with any document in the NASA Online Directives Information System (NODIS), this document shall be superseded by the NODIS document. Any external reference shall be monitored by the Document Owner for current versioning.

Version History

VERSION HISTORY				
Version	Description of Change	Rationale for Change	Author	Effective Date
Basic	Initial Release		Rick Cavanaugh	8/11 /2010
A	Update example, terms, and request flow (4.1). Added Budget and Planning flow (4.1.2).	Annual Document review; PAR 2012-P-365: Example was not what is now considered an EA change.	Doug Dorrer	1/31 /2013
B	Changed Business Process flowchart and process language. Removed Budget and Planning flowchart.	Clarify the process	Doug Dorrer	3/27 /2013
C	Rename document. Update Sections: 1.0, Purpose, 3.0, Definitions, and 4.1.1, Initiator Request. Minor changes to Sections: 2.0, Scope, the References table, and the Records table.	Clarify language. PAR: 2013-P-392. In a recent situation the IVV 11 process was not initiated when it may have been appropriate to do so. Clarify required steps in the process by using "shall's" rather than "may's" (e.g. "Initiator may request" sounds optional and is reworded since it is intended to be a requirement).	Doug Dorrer	5/14 /2014
D	Add the EA website link for "Submit an Idea" to section 4.1.1.1, Initiator Responsibilities.	New feature has been added to the IV&V Confluence tool.	Rick Cavanaugh	2/23 /2017
E	Realigned writing of the SLP with the evolved processes	Process has adapted over time as personnel and conditions changed – catching up the documentation to the working process	Markland Benson	4/12 /2024