National Science Foundation
WHERE DISCOVERIES BEGIN

Alternative Analysis Report Template Process

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NATIONAL SCIENCE FOUNDATION
DIVISION OF INFORMATION SYSTEMS
4201 Wilson Blvd.
Arlington, VA 22330

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1.   OBJECTIVE

Describe how Alternative Analysis Report Template fits into the Continuous Improvement Program (CIP) within the Division of Information Services (DIS) Quality Management (QM) Program

2.   BACKGROUND

### 2.1.   Overview of DIS Quality Management (QM) Program

The DIS Quality Management Program is part of the DIS Program Management Office and consists of five programs.

- Quality Management
  - **Continuous Improvement Program (CIP)**
  - Quality Control/ Test (QC) Program
  - Quality Assurance/ Audits (QA) Program
  - Metrics & Measurement Program
  - Risk Management Program
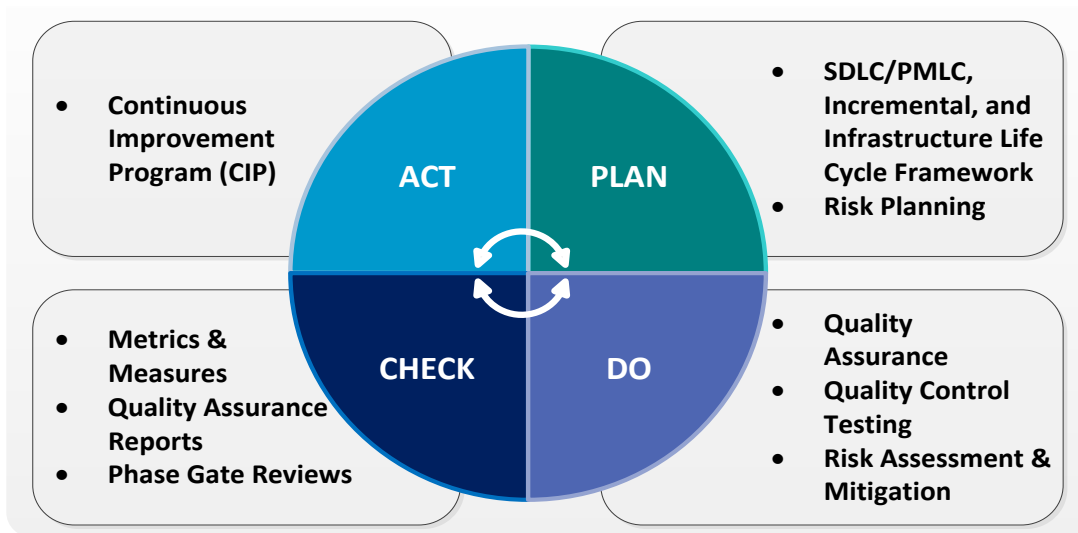
2.1.1. CIP Overview

CIP provides a foundation for improving process performance and product quality through a defined set of guidelines, procedures, checklists and templates throughout the Software Life Cycle.
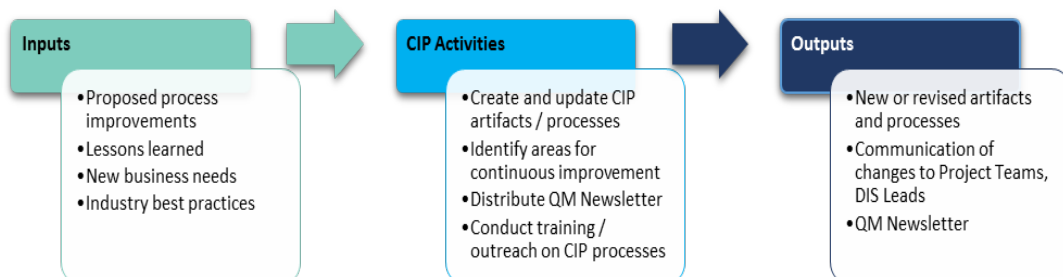
- Define and Deploy Incremental (Agile) Life Cycle development and supporting assets
- Refine SDLC & PMLC Process Maintenance and supporting assets
- Lessons Learned facilitation and process improvement analysis
- Create new CIP artifacts/ process in response to business needs
- Continuous process improvement based on findings from QA, measures, lessons learned, integration points, track implementation of improvements
- Prepare and conduct process improvement brown-bag training sessions
- Process support for congressional mandates
- Infrastructure Life Cycle (ILC) Process Maintenance and supporting assets
- QM newsletter

3.   ANALYSIS OF ALTERNATIVES

3.1.   Definition

An analysis of alternatives (AoA) is an analytical comparison of the operational effectiveness, cost, schedule and risks (CSR) of proposed viable solutions to gaps and shortfalls in operational capability. AoAs document the rationale for identifying and recommending a preferred solution or solutions to the identified shortfall(s).

3.2.   Purpose

AoAs are performed to allow decision makers to understand choices and options for starting a new program or continuing an existing program. The bottom line is cost-effectiveness through non-duplication of effort and lowest risk to successful program delivery.

3.3.   Best Practices and Lessons Learned

A major step leading to a successful AoA is the creation of a well-considered study plan. The study plan establishes a roadmap for how the analysis should proceed, who is responsible for doing what, and why it is being done. It should include the following information:

A. Understand the technology gaps and capability gaps—what needs is the intended system supposed to meet?
B. Develop viable alternatives
    1. Define the critical questions
    2. List assumptions and constraints
    3. Define criteria for viable/non-viable
    4. Identify representative solutions (systems/programs)
    5. Develop operational scenarios to use for comparisons/evaluation
C. Identify, request, and evaluate data from the representative systems/programs (determined to be viable)
    1. Develop models
    2. Work through scenarios

The analysis of alternatives should assess the critical technology elements associated with each proposed solution, including technology maturity, integration risks, and where necessary, technology maturation and demonstration needs.

The Alternatives Analysis Report Template was created to capture and report the assessment performed in the evaluation of alternatives. The Alternative Analysis Report Template supports the Office of Management and Budget (OMB) M-16-21, Federal Source Code Policy: Achieving Efficiency, Transparency, and Innovation through Reusable and Open Source Software directive to develop a consistent process to gather information and conduct analysis in order to evaluate and recommend a solution. The template was developed generically in order to compensate for a wide range of analysis, from software to procurement and beyond that can be utilized by various service areas.

4.   RESOURCE FOR QUESTIONS

DIS QM Lead: Manik Naik

Email: mnaik@nsf.gov

Office: 703-292-4213