Carnegie Mellon University
Software Engineering Institute

Getting Started with ACE/PoPs

Are you ready for the ACE/PoPs pilot program?

SINCE YOU EXPRESSED INTEREST IN PILOTING THE AUTOMATED COST ESTIMATION IN A PIPELINE OF PIPELINES (ACE/Pops), we want to help you get started. This fact sheet helps your organization prepare to participate in the ACE/PoPs pilot program and set your expectations.

Prerequisites

To participate in the ACE/PoPs pilot program, your organization should have more than one DevSecOps pipeline applied to a common product. For the pilot, we also need

- a **tool baseline** that identifies each unique software development pipeline
- an **inventory** of tools used in the pipeline
- business rules that define how each tool performs specific software development functions
- explicit hand-offs and/or data transfers (i.e., interfaces) between the individual tools in each pipeline
- when available, tool logs and telemetry application programming interfaces (APIs)
- an established workflow management tool (e.g., Jira or Gitlab) to track work prior to pipeline entry and at pipeline exit
- the ability to trace a capability from a needs statement and/or explicit requirement through deployment

Traceability from Capability to Software Acceptance

To measure if the program is on track or forecast when a capability will be deployed requires that your organization has well-defined product decomposition so that progress can be traced through product increments. For your pilot to be successful, you must include an initial set of need statements or requirements, use a work breakdown structure (or similar rubric) to provide traceability to a delivered capability, and follow a defined release strategy. The following figure from the Software Acquisition Pathway shows the decomposition of capabilities through the Roadmap and Backlogs phases.

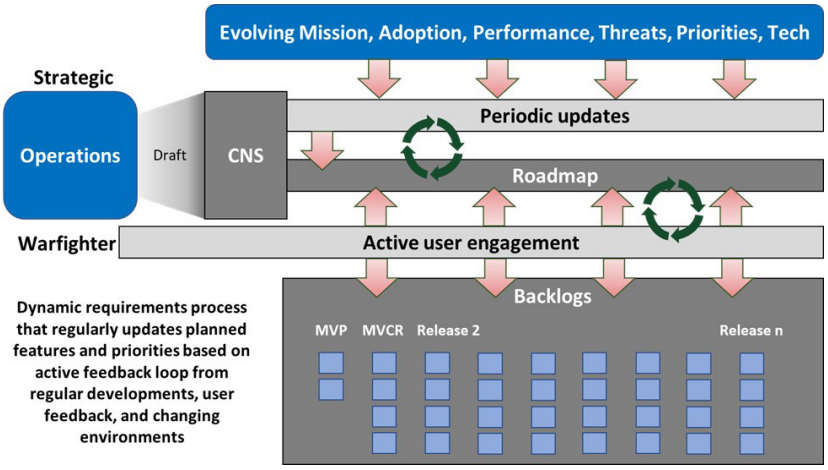

Figure 1: Software Acquisition Pathway—Defining Needs and Engaging Users

Nominal Plan and Schedule

You must establish a plan and schedule prior to beginning the pilot. Ideally, you will have an established working rhythm comprising planning increments and defined sprint intervals. (If you have an effort plan based on an Agile team structure, a release strategy based on a roadmap, and high-level estimates, that is a sufficient working rhythm.) A rough top-down estimate of the work items and their levels of capabilities and releases is needed to compute build completion percentage and estimate nominal delivery schedule dates.

Research to Practice

As part of the SEI's empirical research approach, analysis of your pipeline and schedule performance data is essential. It is also imperative that the SEI research team be able to actively collaborate with your program management and technical staff members to ensure that the research team applies proper context and interpretations of the data.

Software Acquisition Pathway figure used with permission from the Agile Acquisition Framework site (Software Pathway section) hosted by Defense Acquisition University (aaf.dau.edu/aaf/software/define-capability-needs/).

Work with Program Management

We expect to hold a one-hour kickoff meeting with program management, the software lead, the DevSecOps lead, and other staff members that program management would like to be involved in the pilot. This meeting will establish program management pilot objectives. We will provide suggested metrics and dashboard visualizations to facilitate establishing these objectives.

In addition, during the pilot, we require monthly, 30-minute meetings with program management to get feedback on data collection, performance analysis metrics, and the perceived value of the dashboard. We also expect to meet with the software lead on a bi-weekly basis to discuss progress and any technical roadblocks. All key milestones and main tasks, including the kickoff meeting, are described in the following table.

Key Milestones and Tasks

Milestone	Tasks	Your Organization's Role	The SEI's Role
Prepare	Meet with program management and technical leaders	Provide SMEs	Provide SMEs
	Agree on pilot objectives	Provide SMEs	Provide SMEs
	Determine the scope of the pilot	Provide SMEs	Provide SMEs
	Identify key resources	Provide SMEs	Provide SMEs
Conduct Kickoff Meeting	Establish/review the technical baseline and program practices	Provide information and SME access	Conduct a review and establish baseline
	Document/review initial requirements consistent with the pilot objectives	Conduct the program management and SME reviews	Document goals and requirements
	Establish/review the ACE measurement minimum viable capability	Provide SMEs	Provide SMEs
	Prepare a pilot data-collection plan	Provide SMEs	Provide SMEs
	Identify the data collection, storage, and/or visualization tools needed (possibly developed) to apply ACE to the program	Provide SMEs	Provide SMEs
Approve ACE Pilot Roadmap	Agree to a high-level pilot strategy	Provide SMEs	Provide SMEs
	Identify the technical implementation team members	Provide SMEs	Provide SMEs and review the Measurement Pilot plan
	Implement a minimum viable capability for ACE measurement	Approve Pilot Related Work	Provide SMEs
	Review report outputs with management, including achievements, blockers, and progress toward pilot objectives	Provide program management access	Help interpret and note any changes
	Log and review technical issues with the implementation team	Provide data	Maintain a log of lessons learned
Apply ACE on Program	Update the pilot roadmap	Instantiate pipeline data gathering	Provide SMEs for review input and technical consultation
	Evaluate the reports generated by the pilot, including data collection accuracy, analysis capability, and the value of report content (to intended stakeholders)	Provide data	Analyze data
	Evaluate report generation, including time latency (pre-ACE versus post-ACE), cost/effort to implement and maintain ACE capability, and the usability of reports (e.g., dashboards)	Provide data	Analyze data
	Identify environmental or organizational barriers to use	Make SMEs available for interviews	Conduct interviews
Create the Pilot Evaluation Report	Interview program management to validate information quality, usability, and fitness of purpose (i.e., perceived value)	Review the report	Provide the report and presentation

About the SEI

Always focused on the future, the Software Engineering Institute (SEI) advances software as a strategic advantage for national security. We lead research and direct transition of software engineering, cybersecurity, and artificial intelligence technologies at the intersection of academia, industry, and government. We serve the nation as a federally funded research and development center (FFRDC) sponsored by the U.S. Department of Defense (DoD) and are based at Carnegie Mellon University, a global research university annually rated among the best for its programs in computer science and engineering

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