IT-314 Software Engineering

Assignment – 5

SEI-CMMI

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What is SEI-CMMI?

SEI-CMMI (Software Engineering Institute-Capability Maturity Model Integration) is a process improvement approach that provides organizations with the essential elements of effective processes, which will improve their performance. SEI-CMMI-based process improvement includes identifying your organization's process strengths and weaknesses and making process changes to turn weaknesses into strengths.
SEI-CMMI applies to teams, work groups, projects, divisions, and entire organizations.
SEI-CMMI models are collections of best practices that help organizations to dramatically improve effectiveness, efficiency, and quality. These products, or SEI-CMMI solutions, consist of practices.
Practices cover topics that include causal analysis; configuration management; quality assurance; verification and validation; risk management; requirements management; supplier management; project management; interface compatibility; make, buy, or reuse analysis; capacity management; availability management; disaster recovery, data collection, process performance; and more.
SEI-CMM Integration:

- Builds an initial set of integrated models.
- Improves best practices from source models based on lessons learned.
- Establishes a framework to enable integration of future models.

Comparing SEI-CMM and SEI-CMMI:

SEI-CMMI or SEI-CMM Integration is developed to integrate current and upcoming models. It is sort of an upgrade from the SEI-CMM model and describes process improvements for organizations especially in software development. The model includes the following areas: gathering (data and requirement), project planning/tracking, configuration management, training, quality assurance, collaboration and peer reviews.
SEI-CMMI basically assists in the incorporation of traditionally separate organizational functions and operations, sets process enhancement goals, provides supervision for quality processes, and provides a point of reference for evaluating current processes.
1. SEI-CMM came first but was later improved and was succeeded by SEI-CMMI.
2. Different sets of SEI-CMM's have problems with overlaps, contradictions, and lack of standardization. SEI-CMMI later addressed these problems.

3. Initially, SEI-CMM describes specifically about software engineering whereas SEI-CMMI describes integrated processes and disciplines as it applies both to software and systems engineering.
4. SEI-CMMI is much more useful and universal than the older SEI-CMM.

SEI-CMM is a reference model of matured practices in a specified discipline like Systems Engineering CMM, Software CMM, People CMM, Software Acquisition CMM etc. But they were difficult to integrate as and when needed.
SEI-CMMI is the successor of the SEI-CMM and evolved as a more matured set of guidelines and was built combining the best components of individual disciplines of SEI-CMM (Software CMM, People CMM etc). It can be applied to product manufacturing, People management, Software development etc.
SEI-CMM describes about the software engineering alone whereas SEI-CMM Integrated describes both software and system engineering. SEI-CMMI also incorporates the Integrated Process and Product Development and the supplier sourcing.

SEI-CMMI Assessments:

Assessments or appraisals consider three categories of model components as defined in the SEI-CMMI:

Required: Specific and generic goals only.
Expected: Specific and generic practices only.
Informative: Includes sub practices and typical work products.
The SEI has released two guiding documents for SEI-CMMI assessments:

1. ***Appraisal Requirements for SEI-CMMI (ARC):***

It contains the requirements for three classes of appraisal methods Class A, Class B, and Class C. These requirements are the rules for defining each class of appraisal method.

2. ***Standard SEI-CMMI Appraisal Method for Process Improvement (SCAMPI):***

Method Description Document (MDD): currently the only approved Class A appraisal method.

SCAMPI is currently the only approved SEI-CMMI Class A Appraisal Method. That is, SCAMPI satisfies all the requirements of an ARC Class A Appraisal Method and has been approved by the SEI.

There are three classes of SEI-CMMI Appraisal Methods: Class A, Class B, and Class C.

- ***SCAMPI Class A Appraisal:***

SCAMPI-A appraisal is typically conducted when an organization has implemented a number of significant process improvements and needs to formally benchmark its process relative to the SEI-CMMI. SCAMPI-A is the only appraisal method that provides SEI-CMMI Maturity Level or Capability Level ratings.

- ***SCAMPI Class B Appraisal:***

A SCAMPI-B is called for when an organization needs to assess its progress towards a target SEI-CMMI Maturity Level, but at a lower cost than a SCAMPI-A. SCAMPI-B appraisals provide detailed findings and indicate the likelihood that the evaluated practices would be rated as satisfactorily implemented in SCAMPI-A appraisal.

A SCAMPI Class B appraisal, one of three SEI appraisal methods, helps an organization understand, with a relatively high degree of confidence, the status of its software and systems engineering process relative to the SEI-CMMI. A SCAMPI-B is often performed when an organization needs to accurately assess its progress towards a target SEI-CMMI Maturity Level.

- ***SCAMPI Class C Appraisal:***

SCAMPI-C appraisals are shorter and more flexible than SCAMPI-A and B appraisals and are conducted to address a variety of special needs, from a quick gap analysis to determining an organization's readiness for a SCAMPI-A.

SEI-CMMI Strengths:

SEI-CMMI provides guidance for efficient, effective improvement across multiple process disciplines in an organization.
It benefits the organization by providing a common, integrated vision of improvement. The ultimate benefit is improved performance that means decreased costs, improved on-time delivery, improved productivity, improved quality, and improved customer satisfaction.

Another benefit is return on investment. These are all reasons why SEI-CMMI is the choice for process improvement in multiple industries.
1) Produce products of good quality.
2) Improve and enhance customer satisfaction.
3) Increase market share.
4) An important aspect for recognition in the industrial sector.
5) Values for stakeholders.

SEI-CMMI Weaknesses:

The specific application of the SEI-CMMI is its weakness. SEI-CMMI does not cover all organizational aspects. It is just intended for application to the area of software engineering, system engineering, product development, supplier sourcing. Also, SEI-CMMI does not address the issues related to IT operation, for example, security, configuration and change management, and incident response, etc. It does not cover human resources also.
SEI-CMMI also lacks model explanation. People need to spend a lot of time on learning how, when, why, and for whom process improvement is helpful, and understanding the critical factors that cause success and failure.