Best Practices for Enterprise Agile Transformation

A White Paper for the
Federal Software Development Project Community

Select Computing, Inc.
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Best Practices for Enterprise Agile Transformation

Select Computing, Inc. (SCI) can help your organization realize the benefits of Agile by guiding it through the transition from traditional software development life cycle (SDLC), such as the Waterfall, to Agile. SCi is experienced in Enterprise Transformation, establishing organizational best practices for Agile methods, and managing cultural change throughout the project, program, and portfolio levels of an organization. For Agile transformation to succeed, an organization's processes, policies, and culture must all reflect Agile values.

We partner with customers to develop a strategy and roadmap that facilitates the adoption of Agile within each organization's culture. Many customers desire to benefit from the positive impact the iterative and flexible approaches of Agile bear on projects and on project risk. The Agile approach is a significant departure from the traditional approach. The success of the Agile approach requires substantial changes in the way an organization plans and executes projects. The logical place to begin this transformation is by changing the culture of the organization. SCi recommends using the IDEAL (Initiating, Diagnosing, Establishing, Acting, Learning) framework to manage the cultural change. IDEAL is a process improvement methodology advocated by the Software Engineering Institute (SEI).

The Agile best practices such as Scrum or Extreme Programming assume a small, self-managing, co-located team. When an organization runs a single project, these approaches work well. However, challenges increase when coordinating multiple teams working on a large-scale, complex project with numerous iterations to deliver releases that provide stakeholder value. To address scaling Scrum and Agile at the enterprise level, a number of scaling approaches have gained attention including the Scaled Agile Framework (SAFe) (http://scaledagileframework.com/).

Agile Transformations require organizational commitment and a high level of process maturity. SCi has undertaken the same change internally and within projects we execute for our customers. We are highly qualified to guide organizations through this cultural transformation. SCi incorporates Agile principles within our vision and mission. All corporate and commercial functions employ the same Agile approach for managing the work. The key lesson learned from our decade-long adoption of Agile principles is that Agile requires a sound structure to operate within, and a robust management foundation. The management foundation we employ, and recommend for our customers, is the Capability Maturity Model Integrated (CMMI). Our Agile approach has been independently appraised at CMMI maturity level 4. CMMI can be used to guide process improvement across a project, a division, or an entire organization.

Our Concept

Our approach for enterprise agile transformation blends well established management practices depicted in **Figure 1**, and defined below. Rated at CMMI Level 4, for both Development and Services constellations, SCi specializes in blending and leveraging the flexibility of the Agile approach with the

predictability of mature continuous improvement best practices of CMMI and program management best practices of the Project Management Institute's Body of Knowledge (PMBoK).
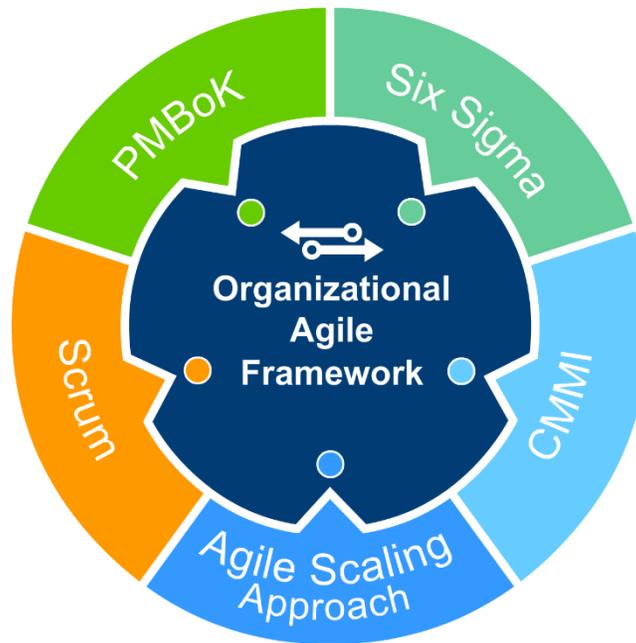

**Figure 1. Best Practices**

Best Practices Definitions:

- *Agile* software development refers to a group of software development methodologies based on iterative development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams.
- *Six Sigma* is a set of techniques and tools for process improvement. It improves business processes by defining, measuring, and analyzing workflows in order to reduce defects in an organization's products and services.
- *Capability Maturity Model Integration (CMMI)* is a process improvement approach that provides organizations with the essential elements of effective processes. It is a capability model developed by the Software Engineering Institute (SEI) along with a group of government and industry representatives.
- *Continuous Improvement* is an ongoing effort to improve products, services, or processes through incremental and breakthrough improvements.
- *Scrum* is an Agile framework for completing complex projects. A Scrum process is distinguished from other agile processes by specific concepts and practices, divided into the three categories of Roles, Artifacts, and Time Boxes.
- *The Project Management Body of Knowledge (PMBoK)* is the preeminent global standard for project management. It provides project professionals with the fundamental practices needed to achieve organizational results and excellence in the practice of project management.

Establishing an Agile culture requires SCi to establish a uniform and standard set of processes that define Agile Governance of projects and work efforts and Agile Operations of the enterprise IT environment. In order to deploy an enterprise-wide Agile training program, we must first ensure that Agile Governance and Operations processes are well defined. Based on this foundation, we can proceed with training and deployment necessary to effect the transformation.

Our approach is straightforward. SCi conducts analysis of existing processes and specification of the new Governance and Operational processes. We define and refine each organization's process by structuring it using the Deming Cycle: PDSA (plan-do-study-act) or PDCA (plan-do-check-act). We implement corporate governance by institutionalizing the DMAIC (Define, Measure, Analyze, Improve, Control) process to improve, stabilize, and optimize the processes.

The IDEAL Model

Institutionalization of the new processes and governance requires cultural change. SCi uses the IDEAL framework developed by the Software Engineering Institute (SEI) to manage culture change in organizations. The IDEAL Model consists of five phases: Initiating, Diagnosing, Establishing, Acting, and Learning. These phases are closely connected with each other to form a continuous cycle of process improvement. **Figure 2** depicts the SCi Integrated Approach for Agile Transformation.
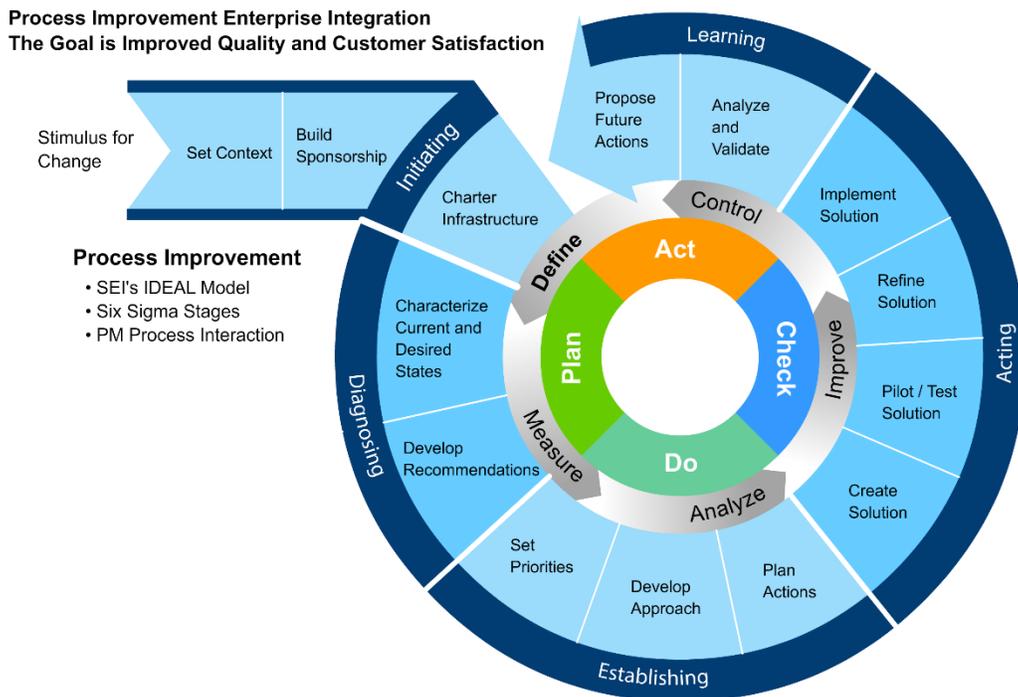
Figure 2. SCi Integrated Approach for Agile Transformation

For example, for a Government Agency, SCi applied the integrated culture change model depicted in Figure 2. When this was completed, our customer was left with the necessary business process

framework that supports Agile in a large organization. The customer was able to continue applying the culture change model to expand and complete the transformation throughout the agency.

The Deming Cycle (https://deming.org/management-system/pdsacycle) is an established best practice for gathering the necessary information to enable continuous process improvement. As a result, the definition of each business process uses the Deming Cycle as its blueprint as a reflection of the organization focus on process improvement.

The DMAIC (http://asq.org/learn-about-quality/six-sigma/overview/dmaic.html) is a data-driven strategy for process improvement. It is an integral component of Six Sigma. It provides for a quantitative approach to managing and operating processes.

IDEAL (http://www.sei.cmu.edu/library/assets/idealmodel.pdf) has been the gold standard for process improvement since 1996 and since then continues to be used in numerous industries as the Best Management practices to support process improvement and culture change.

IDEAL provides a usable, understandable approach to continuous improvement by outlining the steps necessary to establish a successful improvement program. Following the phases, activities, and principles of the IDEAL model has proven beneficial in many improvement efforts. The model provides a disciplined engineering approach for improvement, focuses on managing the improvement program, and establishes the foundation for a long-term improvement strategy.[1]

Process

Agile governance is crucial to successful realization of the benefits of Agile. The flexibility granted to the teams are at the expense of robustness and rigidity in other aspects of lifecycle management. CMMI and Scrum provides rigidity and structure to the project team that enables their creativity to flow. The Scaled Agile Framework (SAFe) is a free and open methodology for adopting Agile at the enterprise level. SAFe is to an organization what Scrum is to an application team. Agile governance provides the management framework to organize and control several simultaneous Agile projects within the organization. SCi is experienced in helping customers to deploy SAFe as the organizational process framework, and Scrum as the project management framework, validated using the CMMI. Agile teams are more successful in a CMMI maturity level 2 or higher organization.

CMMI is a process improvement approach that provides organizations with the essential elements of effective processes. It can be used to guide process improvement across a project, a division, or an entire organization. CMMI helps integrate traditionally separate organizational functions, set process

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[1] Jennifer Gremba and Chuck Meyers, "The IDEAL(SM) Model: A Practical Guide for Improvement," 2009 Carnegie Mellon University, http://resources.sei.cmu.edu/asset_files/Presentation/2001_017_001_23277.pdf (accessed January 4, 2017).

improvement goals and priorities, provide guidance for quality processes, and provide a point of reference for appraising current processes. [2]

SCi applies Agile principles within each project. Our highest priority is to satisfy the customer through early and continuous delivery of valuable products. Short duration iterations and sprints are used to deliver work products including plans, content, training, and regular feedback. The IDEAL Model is used to manage cultural change. Scrum sprints are fixed in duration, typically, 20 working days. The actual number of sprints each phase requires varies, based on the size and priorities of the client organization. **Figure 3** provides a timeline for the Sprint activities within the IDEAL Phases.
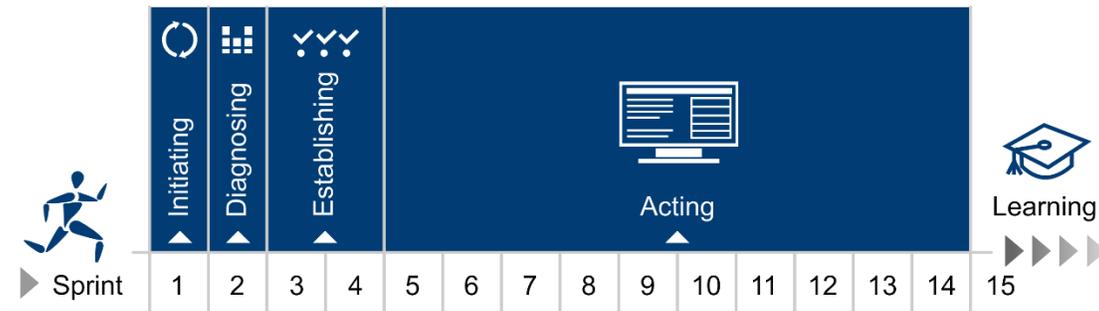
<p align="center">**Figure 3. Timeline: Sprint Activities within IDEAL Phases**</p>

Representative tasks conducted by SCi to help an organization achieve a successful Enterprise Agile Transformation are described below. The five Phases of the Ideal framework (Initiating, Diagnosing, Establishing, Acting, and Learning) guide the activities of the tasks.

Representative Tasks

IDEAL Phase: Initiating Phase

Sprint 1 includes: Best Practices Research

The *Initiating* Phase of the IDEAL framework guides the activities of a specific task. For example, for an Enterprise Agile Transformation project for a Government Agency or Organization, SCi's Sprint 1 (Task 1) includes *Best Practices Research*.

Activities conducted in this phase, for this example, include a sprint planning meeting to define the requirements for a "Best Practices Research and Points of Contact" Document. Items that SCi considers during Sprint 1 include an exploration of the following topics: (a) What is the root stimulus for change? (b) What is the context for change? (c) Who are the sponsors and change agents in the Organization? (d) Who are the resistors and what are the barriers to Agile adoption in the Organization? (e) Who are the

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[2] VIZTEAMSTM, "Top Reasons Why Agile and CMMI Work Better Together," 2013, http://www.vizteams.com/blog/top-reasons-agile-and-cmmi-better-together/ (accessed January 4, 2017).

relevant stakeholders in the Organization? (f) Who are the people that must be committed to implementing Agile adoption in the Organization?

In this example, an annotated outline of the Best Practices Research document is delivered at the conclusion of Sprint 1.

IDEAL Phase: Diagnosing Phase

Sprint 2 includes: Best Practices Research

The *Diagnosing* Phase of the IDEAL framework guides the remaining activities of Task 1, ***Best Practices Research.***

For example, for an Enterprise Agile Transformation project for a Government Agency or Organization, items that SCi considers during Sprint 2 (Task 1) include an exploration of the following topics: (a) How is the existing culture codified and what needs to be changed to codify the cultural change? This may include policies, position descriptions for new hires, orientation materials, posters, websites, guidance documents, and all materials that convey the culture of incorporating Agile into normal organization development. (b) What are the prevalent attitudes about use of Agile? (c) What are the best practices used in the Organization? (d) What are the industry best practices and how do they compare with the Organization's practices? (e) What is the information content, format, and delivery method that most effectively provides value to the Organization?

In this example, a Best Practices Research document is delivered at the conclusion of Sprint 2.

IDEAL Phase: Establishing Phase

Sprints 3, 4 include: Strategic Framework for Agile Integration, Plan Actions

The *Establishing* Phase of the IDEAL framework guides the activities of Task 2, ***Strategic Framework for Agile Integration.***

For example, for an Enterprise Transformation project for a Government Agency or Organization, activities that SCi considers for Sprint 3 (Task 2) include utilizing the current state-of-agile assessments as critical input into the development of the strategic framework that will support the Organization's Agile transformation efforts. The integrated model depicted in **Figure 4** shows the Strategic Framework for Agile integration at the Organization.

Blending the research results of the previous task, SCi tailors the integrated model into a Strategic Framework for Agile that serves as the organizational change management plan. This deliverable sets the stage for the Organization to understand the where and how the enterprise's business processes, policies, and procedures should be modified in order to successfully transition the Organization from its current "as is" state its desired "to be" state.

Activities also include engaging with the Organization's Agile workgroup and stakeholders to capture and identify key performance indicators (KPIs) and metrics in order to benchmark and iteratively monitor the maturity of the Organization's adoption of Agile.

In this example, a Strategic Framework for Agile Integration at the Organization is the deliverable for Sprint 3.
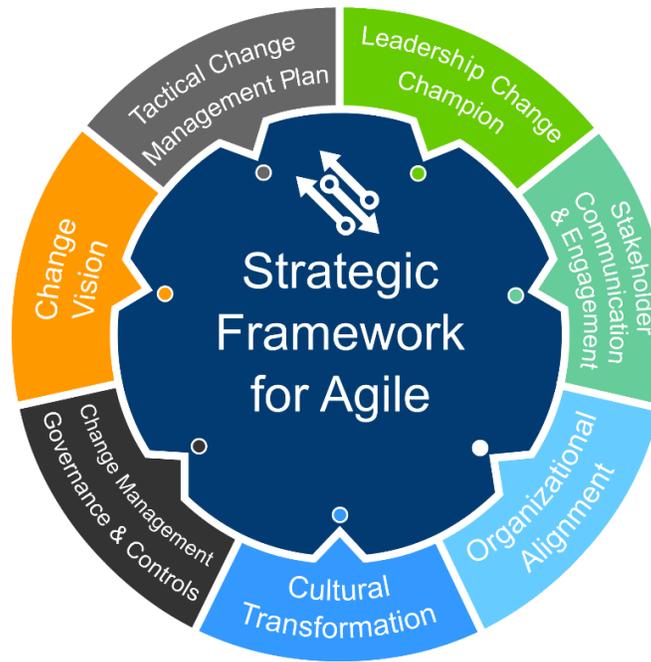

Figure 4. Strategic Framework for Agile

The last step in the ***Establishing*** Phase of the IDEAL model is Task 3, ***"Plan Actions."*** For example, for an Enterprise Agile Transformation project for a Government Agency or Organization, Sprint 4 (Task 3), the task includes developing the *Tactical Action Plan for Agile Integration*. This document summarizes the recommendations for the overall strategy. The document lays out specific, concrete steps the Organization can quickly and easily act upon.

IDEAL Phase: Acting Phase

Sprints 5, 6, 7 include: Create the Solution, Develop Training Plan and Training Curriculum 1.0

The ***Acting*** Phase of the IDEAL framework guides the activities of Task 4, ***Develop Training Plan and Training Curriculum 1.0.*** For example, in an Enterprise Agile Transformation project for a Government Agency or Organization, Sprints 5, 6, 7 (Task 4), the task includes the development of an Agile Training Plan, specific to the Organization, tailored to the target audiences and to the roles the processes require. The training plan builds upon the recommendations and conclusions of previous tasks, including the specific recommended strategy and action items related to training and audience segmentation for maximum impact.

SCi assesses the Organization's training needs to estimate state of Agile competency and standardization across the Organization and utilizes these findings to identify and make recommendations to the Organization for curriculum and prioritized delivery schedule. SCi designs the Organization's Agile curriculum(s) and delivery strategies that efficiently close Agile competency gaps and standardize understanding of leading practices.

At a minimum, the training plan addresses the following elements: (a) Rationale for why someone should be trained and when to ensure successful agile adoption. (b) The tasks to develop and deliver training based on specified roles. (c) The timeframes and logistics for completing all of the work required under this task. (d) Detailed recommendations of whom, within specific organizations and components, should receive which segmented training and when, in priority order, they should receive the training. (e) Justification for why each particularly skilled individual attends a particular segment of training, and the order for which it was recommended.

The first activity of the **Acting** Phase of the IDEAL Model is to **"Create the Solution."** SCi develops a training curriculum for each audience as part of the recommendations provided in the Agile Strategic Framework and Action Plan. SCi leverages the ADDIE (Analysis, Design, Development, Implementation, Evaluation) Instructional Systems Design (ISD) model to design and deliver training **(see Figure 5).**
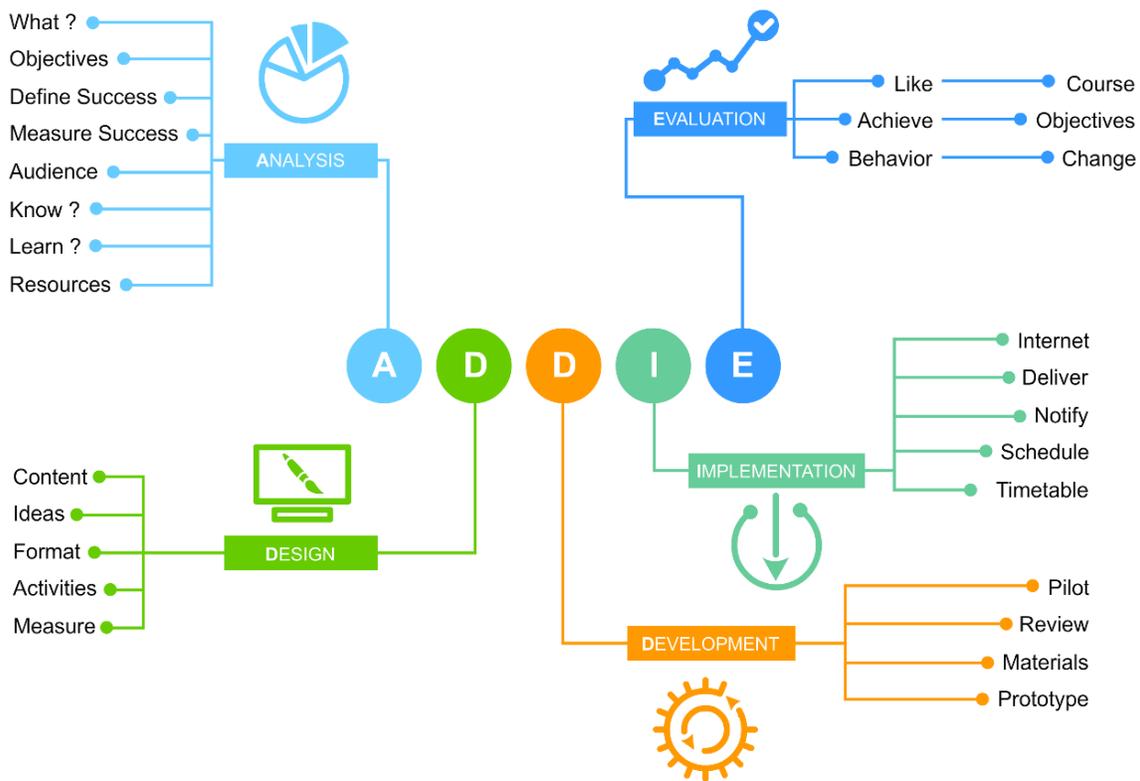

Figure 5. ADDIE Method

IDEAL Phase: Acting Phase

Sprint 8 includes: Pilot the Test Solution

In Sprint 8, the next activity of the **Acting** Phase in the IDEAL Model is to ***"Pilot the Test Solution."*** For example, for an Enterprise Agile Transformation project for a Government Agency or Organization, Sprint 8 (Task 5) includes the delivery of at least one training session to each recommended audience using the detailed recommendations from previous tasks, to ensure the appropriate Organization staff are being trained in the correct priority order.

SCi uses Sprint Retrospectives and process improvement methodologies described in the CMMI models to assess performance of designed materials and improve them before the next scheduled training. SCi's training team is led by a Scrum Master who is a certified Scaled Agile Framework (SAFe) program consultant. The trainers have real-world experience integrating Agile frameworks and concepts into real-world environments in large enterprises. The instructors have experience teaching Agile Development classes concentrating on Scrum, Kanban, and Agile measurable performance. SCi uses automated data collection feedback to collect responses from students and analyze the data to provide real-time, objective training performance data that are used to formally assess and improve training performance.

SCi defines audiences each with its own training approach. For example, governance training targets executive management and the organizations charged with coordinating the execution of multiple concurrent Agile teams. Governance training focuses on the application and management of SAFe.

IDEAL Phase: Acting Phase

Sprints 9, 10 include: Refine the Solution, Develop Training Curriculum 2.0

The next activity of the **Acting** Phase in the IDEAL Model is to ***"Refine the Solution."*** For example, for an Enterprise Agile Transformation project for a Government Agency or Organization, Sprints 9, 10 (Task 6), SCi improves the process definitions and training materials based on the results of CMMI continuous improvement analysis, in conjunction with Organization staff and leadership, and feedback in the form of formal evaluations from each training.

SCi also incorporates any other Organization feedback to improve the training materials. SCi submits the training curriculum based on the above feedback/analysis as well as through incorporation of best practices and lessons learned.

IDEAL Phase: Acting Phase

Sprints 11, 12, 13, 14 include: Implement the Solution, Conduct Final Training

The final activity of the **Acting** Phase in the IDEAL Model is to "***Implement the Solution."*** For example, for an Enterprise Agile Transformation project for a Government Agency or Organization, Sprints 11, 12, 13, 14 (Task 7), SCi delivers additional training sessions to each recommended audience, using the detailed recommendations from the previous task, to ensure this additional round of training includes the incorporation of the *Training Curriculum 2.0* and any additional best practices and lessons learned.

SCi uses the continuous improvement methodologies of CMMI to assess performance of designed materials and improve them before the next scheduled training.

IDEAL Phase: Learning Phase

Sprint 15 includes: Analyze and Validate, Propose Future Actions

The final phase of the IDEAL Model is the *Learning* Phase, which completes the improvement cycle. This phase includes learning from the past experiences in process improvement *(Analyze and Validate)* and expanding the Organization's competency to adopt new technologies in the future *(Propose Future Actions)*.

In the Learning Phase, SCi prepares an analysis on how the intended purposes were achieved and what could have been done more efficiently, and documents lessons learned. Based on this, SCi provides proposals for future change implementations to the appropriate management levels in the Organization to take into consideration. Upcoming iterations use the outputs of the previous Learning Phase for further improving the implementation process.

SCi uses the CMMI process improvement approach during the Learning Phase to collect lessons learned and then apply them to subsequent rounds of the IDEAL change cycle.

At CMMI maturity level 4, SCi establishes quantitative objectives for quality and process performance, and uses them as criteria in managing projects. CMMI allows for flexibility in implementing Agile, keeping the focus on an organization's business objectives, and providing appraisal methods.

Conclusion

SCi is experienced in Agile Enterprise Transformation. When successfully implemented, the transformation enables organizations to deliver better products more consistently. Organizations have been challenged with scaling a team based Agile approach to meet the program and portfolio needs of large enterprises. Transformation requires significant cultural changes within an organization. To manage cultural change, SCi recommends the SEI IDEAL Model, which provides an iterative framework for implementing a process improvement project. A CMMI Level 4 company, SCi has implemented Agile within numerous Federal Agencies, such as the Centers for Medicare and Medicaid Services and the Department of Veterans Affairs.

About Select Computing, Inc.

Select Computing, Inc. (SCi) is an innovative CMMI Maturity Level 4 appraised company, for both the development and services models. SCi specializes in blending CMMI level 4 process maturity and Agile methodology to produce successful outcomes. SCi can help an enterprise make the transition to Agile. Implementing Agile, using a contractor that is at CMMI level 4, can result in less rework and provide significant benefits. Implementing a CMMI compliant software development process that is also Agile will bring the repeatability and predictability offered by CMMI.

With direct, practical, and proven experience integrating CMMI level 4 and Agile, SCi brings innovative approaches to our customers and facilitates their initiatives while relying on quantitative management and continuous process improvement to improve efficiency and realize significant cost savings.

SCi is based in Minneapolis, MN, with a Government Branch Office located in Columbia, MD. Additional information about SCi can be found at www.selectcomputing.com.

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