



How the CMMI Maturity Level 2 Practices Benefit the 367 TRSS



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Intro to the Software Technology Support Center (STSC)



- Chartered in 1987 by the USAF to improve development/sustainment of systems and software engineering
- Customers include: Army, Navy, Marine Corps, Air Force and other Executive Branch units
- The STSC draws on an organic cadre certified in:
 - Capability Maturity Model Integration[®] (CMMI[®])
 - Scaled Agile Framework (SAFe[®])
 - Personal Software Process[®] / Team Software Process[®] (PSP[®] / TSP[®])
 - Air Force Systems Engineering Assessment Model (AFSEAM)
- The STSC contracts for unique expertise (e.g, Subject Matter Experts (SMEs) in Microsoft Team Foundation Server) and to supplement organics





Intro to the 367th Training Support Squadron (TRSS)



The 367 TRSS develops a vast array of operational training products for the Air Force's maintenance enterprise





The Problems



The 367 TRSS was operating in a perpetual state of crisis

- Ability to establish solid customer requirements was lacking
 - 95%+ of projects required rework
 - Fewer than 5% of projects delivered on-time (e.g., 1 yr. simulator build turned into a 4 yr. build)
- Creation of solid work processes had not occurred leaving work ad hoc and unrepeatable
 - Development team failed to identify 1500 defects (one project)
 - Project Managers often over-committed to customers
- Establishment of employee core knowledge had not occurred
 - A majority of military personnel rotate out every 4 years
 - 90% of workforce has no prior experience in software/educational development

Our Organizational Maturity was non-existent!



Root Cause Analysis



- Identified the need for
 - Process development
 - External mentoring and assessment
 - Set of standards and best practices
- Several project management frameworks were evaluated
 - Agile Development Methods
 - Project Management Body of Knowledge
 - Capability Maturity Model Integration (CMMI)
- CMMI for Development
 - Framework of best practices, not requirements
 - Incremental improvement – matures with the organization
 - Continuous Improvement – data driven



The Problems Solved by CMMI Maturity Level 2 Best Practices



Requirements Establishment was lacking

- CMMI Requirements Management best practices suggest we:
 - Understand requirements
 - Obtain commitment to requirements
 - Manage requirements changes
 - Maintain bi-directional traceability of requirements
 - Ensure alignment between project work and requirements



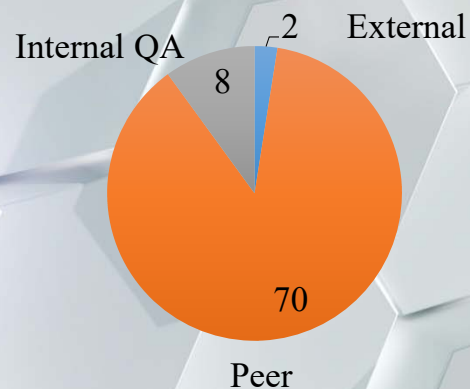
The Problems Solved by CMMI Maturity Level 2 Best Practices



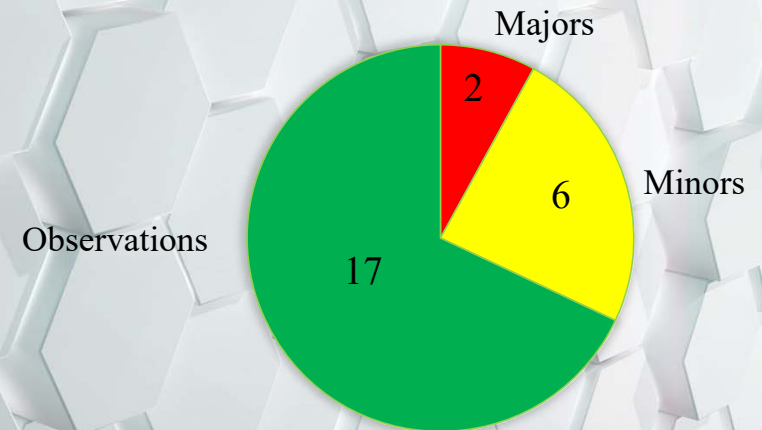
Project Processes were ad hoc and unrepeatable

- CMMI Project Planning and Process & Product Quality Assurance best practices suggest we:
 - Define standard work and project lifecycle phases
 - Objectively evaluate processes
 - Objectively evaluate work products
 - Communicate and resolve gaps

Product Defects



Process Audits



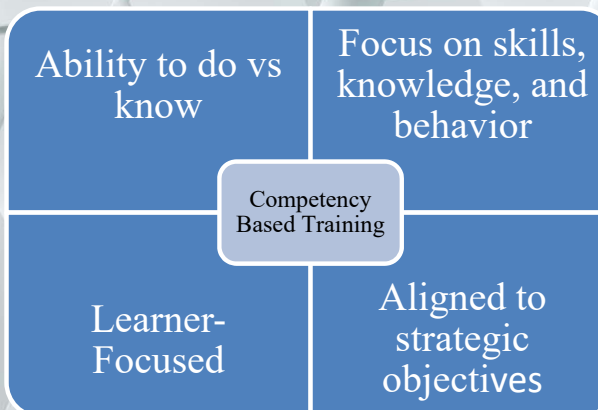


The Problems Solved by CMMI Maturity Level 2 Best Practices



Corporate knowledge was shallow

- CMMI Project Planning best practices suggest we:
 - Plan needed knowledge and skills






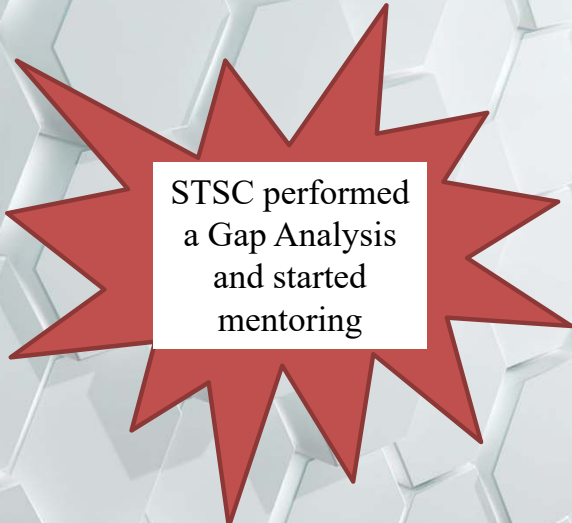
CMMI Implementation



- First Attempt – Lessons Learned
 - Commitment to change was lacking
 - Failed to commit resources – organization only assigned 1 individual
 - Set unrealistic goals – certification in 2 years
 - Technological solutions were not considered – paper-based
- Second Attempt – Success
 - Commitment to change was established
 - Committed resources – 7-person team
 - Set realistic goals - stopped chasing certification
 - Technology solutions were integrated



STSC taught
SMEs Intro to
CMMI V1.3



STSC performed
a Gap Analysis
and started
mentoring



Process Development



- Software leveraged
 - Integration of MS Team Foundation Server, MS Project, and MS Excel reporting

Backlogs Queries

- Course Information
- Requirement Types
- Requirements

Current

1. Establishment Phase

Future

- 2. Analysis Phase
- 3. Requirements Phase
- 4. Production Phase
- 5. Evaluation Phase
- 6. Implementation Phase
- 7. Lifecycle Maintenance

Backlog Board Capacity

Group by Requirements Person All

Proposed 19.25 h Assigned In work Completed

Analysis Phase Resource Planning 1.75 h

State Proposed

ESP

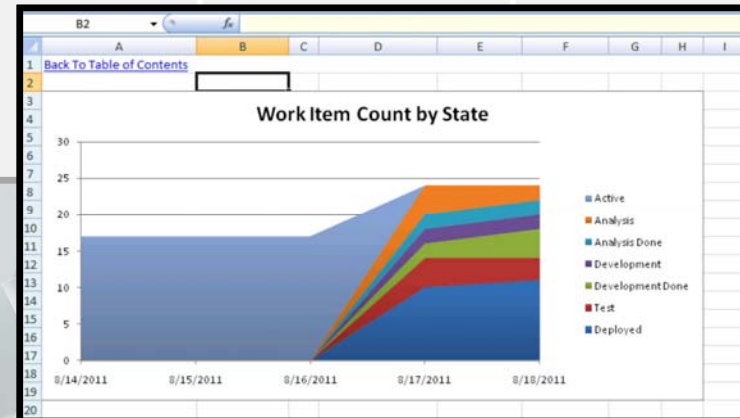
Analysis Section 0.75

Discipline

Project Managers 1

Discipline

STSC shared lessons learned from other customers

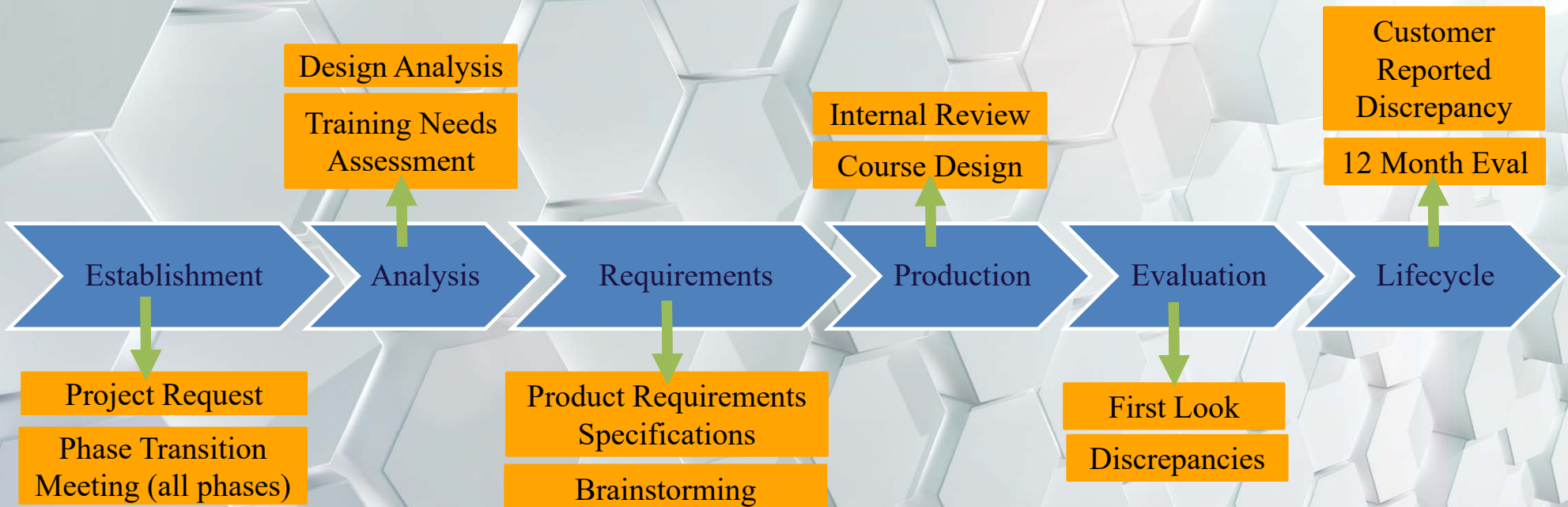




Process Development



CMMI best practices are the main framework but has with infusions from Art of the Possible, agile methods, and other project management models





Process Development



Each project is planned using the 500+ standardized tasks

Establishment Phase
Transition Meeting

0.5 h

State Proposed

ESP

Standard Work Packages

Actors -

Entry Criteria -

Inputs -

Steps -

Output -

Exit Criteria -

Measures -

Brief A4/Change Authority

Establishment Phase
Transition Meeting

0.5

- Reduces guess work
- Makes abnormalities more visible
- Enables Continuous Process Improvement

STSC conducted a
SCAMPI B
appraisal and
continued
mentoring



Result of this Initiative



- Only 5% projects require rework (was 95+%)
- Over 75% of projects delivered on time (was below 5%)
- 367 TRSS Process SMEs have evolved into mentors:
 - Medical Training Organizations
 - Educational and Training Development Organizations
 - Aircraft Maintenance Group
- Achieved CMMI V1.3 Maturity Level 2 with strong inroads into ML3
- 367 TRSS continuing to improve and mature using best practices of CMMI ML3



Conclusion



- An organization needs to document their own standard work with adjustments based on best practices of the CMMI
- An organizational culture change requires more time than anticipated
- Continuous engagement by mentors was a major factor towards success
 - Roadmaps for improvement
 - Gap Analyses / Assessments
 - Increased confidence and provided direction
- The integration of an organization's task flow with technology ensures consistency, employee efficiency, and transparency
- CMMI Maturity Level 2 best practices apply to virtually any organization/development model:
 - Configuration Management
 - Measurement and Analysis
 - Process and Product Quality Assurance
 - Project Monitoring and Control
 - Project Planning
 - Requirements Management



Questions?

