



CMMI Institute

CMMI FOR SERVICES, THE PREFERRED CONSTELLATION WITHIN THE SOFTWARE TESTING FUNCTION OF A SOFTWARE ENGINEERING ORGANIZATION

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**CAPABILITY
COUNTS 2017**
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PRESENTATION OUTLINE

- Purpose
- Background of the Software Testing Organization
- Implementing CMMI for Services
 - Strategic Service Management
 - Service System Development
 - Service System Transition
 - Service Delivery
 - Capacity and Availability Management
- Summary

PRESENTATION OUTLINE

- **Purpose**
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PURPOSE

- Examine how the CMMI for Services model was used in the implementation of a new software testing function within a software engineering organization
- Examine the implementation of five service specific process areas within the software testing service: Strategic Service Management, Service System Development, Service System Transition, Service Delivery, Capacity and Availability Management

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BACKGROUND - I

- Software testing service system (a new software testing facility) was a new functional unit within a software engineering organization responsible for business and operational software development
- The new software testing facility focused on automated functional and performance/load testing

BACKGROUND - 2

- Why was CMMI for Services considered
 - CMMI for Development was already being used by the software development staff of the software engineering organization
 - Expectations for having a mature software testing facility were high
- Initial plan to implement best practices from a few process areas of CMMI for Services model
 - Strategic service management, service system development, service system transition, service delivery, capacity and availability management

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IMPLEMENTING CMMI FOR SERVICES

Strategic Service Management (STSM)

Why Strategic Service Management ?

We wanted to ensure that we planned, defined, and revised the new software testing service system's standard services in a systematic manner

IMPLEMENTING CMMI FOR SERVICES

Strategic Service Management (STSM)

The purpose of Strategic Service Management (STSM) is to establish and maintain standard services in concert with strategic needs and plans.

SG 1 Strategic needs and plans for standard services are established and maintained.

SP 1.1 Gather and analyze data about the strategic needs and capabilities of the organization.

SP 1.2 Establish and maintain plans for standard services.

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IMPLEMENTING CMMI FOR SERVICES

Strategic Service Management (STSM)

- STSM SPI.1 Identified need to place more emphasis on potential patterns of risk in the deployment of the new testing service
- STSM SPI.2 Planned and provided software testing as a standard service
 - Re-assessed existing capabilities and needs
 - Reviewed standard services with relevant stakeholders

IMPLEMENTING CMMI FOR SERVICES

Strategic Service Management (STSM)

SG 2 A set of standard services is established and maintained.

SP 2.1 Establish and maintain properties of the organization's set of standard services and service levels.

SP 2.2 Establish and maintain descriptions of the organization's defined standard services.

IMPLEMENTING CMMI FOR SERVICES

Strategic Service Management (STSM)

- STSM SP2.2 Service descriptions were developed and placed on a web site for use by stakeholders
 - Web site access to descriptions allowed for ongoing review and feedback by stakeholders

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IMPLEMENTING CMMI FOR SERVICES

Service System Development (SSD)

Why Service System Development

- We wanted to ensure we adequately planned and addressed the development of the new software testing service system (the software testing facility)

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Service System Development (SSD)

The purpose of Service System Development (SSD) is to analyze, design, develop, integrate, verify, and validate service systems, including service system components, to satisfy existing or anticipated service agreements.

SG I Stakeholder needs, expectations, constraints, and interfaces are collected, analyzed, and transformed into validated service system requirements.

SP 1.1 Collect and transform stakeholder needs, expectations, constraints, and interfaces into stakeholder requirements.

SP 1.2 Refine and elaborate stakeholder requirements to develop service system requirements.

SP 1.3 Analyze and validate requirements, and define required service system functionality and quality attributes.

IMPLEMENTING CMMI FOR SERVICES

Service System Development (SSD)

SSD SGI Supported use of a more formal approach to developing the stakeholder requirements

- Used face-to-face meetings used to solicit and refine stakeholders' needs and requirements (SPI.1)
- Institutionalized the practice of developing operational concepts and scenarios to provide better visualization and detailed specification of the software testing system requirements (SPI.3)

IMPLEMENTING CMMI FOR SERVICES

Service System Development (SSD)

SG 2 Service system components are selected, designed, implemented, and integrated.

SP 2.1 Select service system solutions from alternative solutions.

SP 2.2 Develop designs for the service system and service system components.

SP 2.3 Manage internal and external interface definitions, designs, and changes for service systems.

SP 2.4 Implement the service system design.

SP 2.5 Assemble and integrate implemented service system components into a verifiable service system.

IMPLEMENTING CMMI FOR SERVICES

Service System Development (SSD)

SSD SG2 Facilitated the design and development of the new software testing service system

- Criteria were established to select the solution for building the testing facility (SP2.1)
- Descriptions of roles, responsibilities and skills of testing staff were developed (SP2.2)
- Facility design completed and well documented (SP2.4 and SP 2.5)

IMPLEMENTING CMMI FOR SERVICES

Service System Development (SSD)

SG 3 Selected service system components and services are verified and validated to ensure correct service delivery.

SP 3.1 Establish and maintain an approach and an environment for verification and validation.

SP 3.2 Perform peer reviews on selected service system components.

SP 3.3 Verify selected service system components against their specified requirements.

SP 3.4 Validate the service system to ensure that it is suitable for use in the intended delivery environment and meets stakeholder expectations.

IMPLEMENTING CMMI FOR SERVICES

Service System Development (SSD)

SSD SG3 Supported the validation and verification of the new “automated software testing” service system

- The automated software testing tools were verified and validated in a controlled testing environment
- Peer reviews were used to assess implementation of the structured testing designs staff would perform (SP3.2)

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IMPLEMENTING CMMI FOR SERVICES

Service System Development (SSD)

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SSD SG3 Supported validation and verification of the new “automated software testing” service system

- Stakeholders used to review verification and validation effort to help insure testing environment reflected real-world environment in which software would operate
- Periodic formal inspections by third-party software quality assurance personnel conducted of testing procedures and of training for testing staff (SP3.3 and SP3.4)

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IMPLEMENTING CMMI FOR SERVICES

Service System Transition (SST)

Why Service System Transition

- We wanted to ensure we adequately addressed the ability to deploy the new software testing standard service (software testing facility), while continuing to provide ongoing software testing without any disruptions

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Service System Transition (SST)

The purpose of Service System Transition (SST) is to deploy new or significantly changed service system components while managing their effect on ongoing service delivery.

SG I Preparation for service system transition is conducted.

SP 1.1 Analyze the functionality, quality attributes, and compatibility of the current and future service systems to minimize impact on service delivery.

SP 1.2 Establish and maintain plans for specific transitions of the service system.

SP 1.3 Prepare relevant stakeholders for changes in services and service systems.

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Service System Transition (SST)

SST SGI Supported the planning and communication with the stakeholders who were involved in the activities from Strategic Service Management and Service System Development

- Software testing staff worked with stakeholders to develop and obtain buy-in on the transition plan (SPI.1 and SPI.2)
- Prepared stakeholders for the changes to deployment of test services was a major focus (SPI.3)

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Service System Transition (SST)

SG 2 The service system is deployed to the delivery environment.

SP 2.1 Systematically deploy service system components into the delivery environment based on transition planning.

SP 2.2 Assess the impacts of the transition on stakeholders and service delivery, and take appropriate corrective action.

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Service System Transition (SST)

- SST SP2.1 Reinforced need to place all testing service components (the test facility configuration, testing tools, and support documentation) under configuration control
- SST SP2.1 Reemphasized the importance of continued validation of the testing service system in the delivery environment. Stakeholders continued to be involved to insure the system operates according to their expectations

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Service System Transition (SST)

- SST SP 2.2 Assisted with assessing the impact of transition and taking corrective actions
 - Post-deployment reviews were held with stakeholders to assess the effectiveness of the new testing service

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IMPLEMENTING CMMI FOR SERVICES

Service Delivery (SD)

Why Service Delivery

- We wanted to ensure we adequately addressed the development of the service agreement and the delivery of the services for the new software testing standard service

IMPLEMENTING CMMI FOR SERVICES

Service Delivery (SD)

The purpose of Service Delivery (SD) is to deliver services in accordance with service agreements.

SG 1 Service agreements are established and maintained.

SP 1.1 Analyze existing service agreements and service data to prepare for expected new agreements.

SP 1.2 Establish and maintain the service agreement.

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IMPLEMENTING CMMI FOR SERVICES

SD (SGI) used to develop Service Agreement

The service agreement described

- Scope and objectives of the software testing work
- Specific types of software testing to be conducted
- Roles and responsibilities of all stakeholders, including the customers, the service providers, the funding organization
- Resources required for testing (staffing, facility, software, hardware) and who would be responsible for providing these resources

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IMPLEMENTING CMMI FOR SERVICES

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SD (SGI) used to develop Service Agreement

The service agreement described

- Availability of the software testing services
- Identifiable costs and commitments to funding by the stakeholders
- Expected milestones and schedule
- How the service(s) were to be evaluated and acceptance determined

IMPLEMENTING CMMI FOR SERVICES

Service Delivery (SD)

SG2 Preparation for service delivery is conducted.

SP 2.1 Establish and maintain the approach to be used for service delivery and service system operations

SP 2.2 Confirm the readiness of the service system to enable the delivery of services.

SP 2.3 Establish and maintain a request management system for processing and tracking request information

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IMPLEMENTING CMMI FOR SERVICES

SD (SG2) used to prepare for implementation of service delivery

- SD SP2.1 Used to identify the time and resource requirements for testing service delivery
- SD SP2.2 Used to confirm readiness for service of the testing facility

IMPLEMENTING CMMI FOR SERVICES

Service Delivery (SD)

SG 3 Services are delivered in accordance with service agreements.

SP 3.1 Receive and process service requests in accordance with service agreements.

SP 3.2 Operate the service system to deliver services in accordance with service agreements.

SP 3.3 Maintain the service system to ensure the continuation of service delivery.

IMPLEMENTING CMMI FOR SERVICES

SD (SG3) used to insure services are delivered in accordance with the service agreements

- SD SP3.1 Used to help testing facility receive and process the requests for testing
 - Subpractice 8 especially useful in helping review the software testing request status and confirm the testing results with relevant stakeholders

IMPLEMENTING CMMI FOR SERVICES

SD (SG3) used to insure services are delivered in accordance with the service agreements

- SD SP3.2 Used to operate the software testing service system in accordance with the service agreement
 - Subpractice 5 especially useful in managing and controlling operationally-oriented quality attributes for the testing service. In particular, two quality attributes were carefully managed - the security of the facility and the reliability of the testing service

IMPLEMENTING CMMI FOR SERVICES

SD (SG3) used to insure services are delivered in accordance with the service agreements

- SD SP3.3 Used to maintain the testing service system to insure the continuation of service delivery
- Software testing places special emphasis on maintenance
 - Preventive maintenance of the testing hardware and software
 - Adaptive maintenance of the testing facility hardware and software to accommodate the different types of software we must be prepared to test

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IMPLEMENTING CMMI FOR SERVICES

Capacity and Availability Management (CAM)

Why Capacity and Availability Management

- We wanted to ensure we had the resources we needed (staff, software, hardware, network support) in the software testing service system and that the resources were available when needed

IMPLEMENTING CMMI FOR SERVICES

Capacity and Availability Management (CAM)

The purpose of Capacity and Availability Management (CAM) is to ensure effective service system performance and ensure that resources are provided and used effectively to support service requirements.

SG 1 Preparation for capacity and availability management is conducted.

SP 1.1 Establish and maintain a strategy for capacity and availability management.

SP 1.2 Select measures and analytic techniques to be used in managing the capacity and availability of the service system.

SP 1.3 Establish and maintain service system representations to support capacity and availability management.

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IMPLEMENTING CMMI FOR SERVICES

CAM (SGI) used to establish and maintain a strategy (we especially focused on having measures) for managing capacity and availability

Developed capacity and availability measures for managing CAM, including:

- Percentage the software testing facility was available within agreed hours
- Downtime of the testing facility or parts of the facility
- Use of critical software testing resources

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Capacity and Availability Management (CAM)

SG 2 Capacity and availability are monitored and analyzed to manage resources and demand.

SP 2.1 Monitor and analyze capacity against thresholds.

SP 2.2 Monitor and analyze availability against targets.

SP2.3 Report capacity and availability management data to relevant stakeholders.

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CAM (SG2) used to monitor and analyze demand for resources

- SD SP2.1 Monitored capacity - in particular, we monitored the use of software testing resources (hardware and software) to determine normal use
- SD SP2.2 Monitored availability - in particular, we monitored the reliability (mean time between failure) of the software test equipment and maintainability (time to repair failed equipment)

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SUMMARY

Today, we

- Examined how the CMMI for Services model was used in the implementation of a new software testing function within a software engineering organization
- Examined five service specific process areas and how they were used within the software testing service:
 - Strategic Service Management, Service System Development, Service System Transition, Service Delivery, Capacity and Availability Management

Are There Any Questions ?

SUMMARY

THANK YOU !

CONTACT INFORMATION

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