

# Applying CMMI-SVC Process Areas to CMMI-DEV Projects

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# Topics for Discussion

- Why look Beyond Development?
- Sampling of Specific Service Process Areas that enhance the Engineering Process Areas
- Benefits of Service PAs to Development Projects

# WHY????

- Expectations of the product being developed
  - Sustainment expected
  - Maintenance phase expected
  - Product Warranties
  - User Training
  - Technology Refresh

**Product Development has evolved to a Service System**

# Goal Setting

- Production Goal: Establish a product that can transition to ensure maintenance of the functionality of the components as well as the total functionality of the product:
  - Plan for the maintainability of the product
  - Understand Customer Needs
  - Set appropriate expectations
- Service Goal: Plan for the continued support of the product in use:
  - Establish the Service System
  - Understand Customer Needs
  - Set appropriate expectations

# Process Areas to Choose

- ALA Carte Menu, Please



# Process Area Selection

Although the Production and Service Goals are similar, it is within production that the first consideration for the service life cycle needs to be defined, communicated and established. The overlap is essential to long term success.

- The selected Process Areas are divided into three sets:
  - **SET 1** – core process areas that start implementation under a production life-cycle but include service concerns so they can successfully be instantiated into the service life cycle (a sampling),
  - **SET 2** – those service specific process areas (or goals within a PA) that **MUST** be considered during the production phase and NOT wait for the Services life-cycle to commence, and
  - **SET 3** – those process areas (or goals within a PA) that will be initiated and implemented during the Services life-cycle (SET 1 and SET 2 will continue to evolve during the Services life-cycle).

# Set 1

Core process areas that start implementation under a production life-cycle but include service concerns so they can successfully be instantiated into the service life cycle

- **Risk Management (RSKM)**
- **Requirements Management (REQM)**

**ONLY A SAMPLE – OTHERS MAY APPLY**

# Risk Management (RSKM)

## SG 1 – Prepare for Risk Management

- Identify Risk Sources and Categories
  - These should include both sources from the development and operational life cycles
- Define Risk parameters
  - Evaluation of development risks should include their potential risks into the operational service of the product
  - Likelihood of occurrence needs to apply to both within development and during operation
- Establish a Risk Management Strategy
  - Strategy needs to apply to decisions made during development that could identify a risk in operation
  - Broaden the strategy to be forward looking
    - Decisions made during development could identify a risk during operation

# Risk Management (RSKM)

## (continued)

### SG 2 – Identify and Analyze Risks

- Identify Development and Operational Risks
  - Identification must include both life cycles
  - Identification of a development risk could identify additional operational risks
- Analyze Risks
  - Analysis of a development risk could identify an additional operational risk
- Mitigation Plans
  - Mitigation plans should be seamless:
    - Including steps in development to mitigate operational risk
    - An operational risk may lead to additional development

# Requirements Management (REQM)

## SG1 – Manage Requirements

- Understand Requirements
  - During development requirements must be prioritized to gain insight into the customer's priority needs
  - This is the first step in understanding the service requirements pertaining to functionality
- Manage Requirements
  - As requirements change, analysis as to the service capabilities and delivery must occur
- Bidirectional Traceability
  - Critical to ensure that the requirements do indeed meet the service requirements
- Identify Inconsistencies
  - Essential to not only look at inconsistencies when delivering the product but inconsistencies in the final delivery of service on the product

# Set 2

Those service specific process areas (or goals within a PA) that **MUST** be considered during the production phase and **NOT** wait for the Services life-cycle to commence

- **Service System Transition (SST)**
- **Strategic Service Management (STSM)**
- **Capacity and Availability Management (CAM)**
- **Service System Development (SSD)**
- **Service Continuity (SCON)**

# Service System Transition (SST)

## SG 1 – Prepare for Service System Transition

- Analyze and Develop Transition plans
  - Include this analysis during both Requirements Management and Product Integration during Development
  - Requirements/ Functions/ Tools/ Components must all factor into transitioning the system
  - Analyze Warranties and Technology/ Hardware refresh needs and relate those needs to the production phase
- Prepare Stakeholders
  - With considerations around warranties and refresh – production can set the expectation for service capabilities
  - Customers should buy the product knowing what services are provided in association with the product

# Strategic Service Management (STSM)

## SG 1- Establish Strategic Needs and Plans for Standard Services

- Understand the “life of product”
  - Define the typical length of time the product will be in service
- Define what is and is not applicable to “standard service”
  - Define the goal of the organization to commit to servicing this product
    - What will be covered and what will not (warranties, maintenance plans, extended warranty options...)
    - Will servicing be supplied with resources from within or will separate components be covered by suppliers
- Achieve organizational and customer agreements on what is and is not standard services
- Define the organizational strategy for service implementation and commitment
  - Understand what this means for the business future
  - Does it fit with organizational business goals
- Needs to begin during production in order to establish appropriate communication and paths going forward from production to service

# Strategic Service Management (STSM) (continued)

## SG 2 – Establish Standard Service

- Once we have identified the standard services that will be provided either internally or via suppliers:
  - Define service levels
    - These should include response time/ acceptable down time/ support via phone/ support via visits/ support via mailing or visiting a central location
  - Define acceptable variation
    - Pricing/ resources/ Timetable for upgrades

# Capacity and Availability Management (CAM)

## SG 1 – Prepare for Capacity and Availability Management

- Strategically identify what is needed to maintain and support the product when required
  - This will influence the components that are acquired and integrated into the final product
  - Establish a commitment for the release of the product into the service domain
  - Identify any overlap on production fixes versus normal servicing and maintenance
- Imperative that commitments on service maintenance and replacement be understood as part of production choosing suppliers of individual components
- Identify measurements that the system/ production vendors can commit to as they evolve or transition into service life cycle

# Capacity and Availability Management (CAM) (continued)

## SG 2 – Monitor and Analyze Capacity and Availability

- Identification of Planned Capacity and Planned Availability should be established during the Production phase so that monitoring of capacity and availability can occur during the services life cycle
  - Reports on the monitoring will be generated during the service life cycle

# Service System Development (SSD)

## SG 1 – Develop and Analyze Stakeholder Requirements

- Identifying stakeholder requirements for the product after it is in use is critical to developing the service requirements. As production is going on each component may have a separate stakeholder requirement or expectation for longevity/ maintenance/ warranty
- Depending on the complexity of the product itself this exercise needs to be initiating very early in the production cycle
- Commitment and agreement on these expectations needs to be defined – if these are not validated – the product may not sell!

# Service System Development (SSD)

## (continued)

### SG 2 – Develop Service Systems

- Service system solutions should be evaluated during production
  - Critical during Technical Solutions that this be coupled
    - Trade studies on tools/ component selection
    - Allocation of requirements to functions to set service expectations
    - Developing the production design to ensure service system capability
- During Product Integration consideration to service system may come to play as the system is built – particular reference to functional deliveries (Agile environments)

# Service Continuity (SCON)

## SG1 – Identify Essential Service Dependencies

- In keeping with both Requirements Development and during Requirements Management it is critical that the customer priorities on functionality be agreed to
- Prioritization of functions may be an input to Risk Management, Decision Analysis and Resolution, and Technical Solutions as the product is being developed
- As requirements/ functions are being developed, management will have an insight into the resources needed into services (number of people/ skills and knowledge of those individuals/ budget/ timeline)

# Service Continuity (SCON) (continued)

## **SG2 – Prepare for Service Continuity**

- Continuity plans and training should be accomplished during production
  - Depending on expectations of the plan – production/ product design/ product integration could be affected

## **SG3 – Verify and Validate the Service Continuity Plan**

- An actual dry-run of the continuity plan would be worthwhile during production since results/ good and bad should go back into the production
  - If done during production continuity risks can be mitigated by a change in the product configuration – a possibility

# Set 3

Those process areas (or goals within a PA) that will be initiated and implemented during the Services life-cycle (SET 1 and SET 2 will continue to evolve during the Services life-cycle)

- **Service Delivery (SD)**
- **Incident Resolution and Prevention (IRP)**
- **Service System Transition (SST)**
- **Service System Development (SSD)**

# Service Delivery (SD)

## SG1 – Establish Service Agreements

- This activity since customer expectations have been addressed during production should be understood.
  - In lieu of reviewing “existing” Service Agreements – can evaluate those commitments that were planned for during production
- Establishing the service agreement with customers is more clearly negotiated since requirements are aligned to the service

# Service Delivery (SD)

## (continued)

### **SG2 – Prepare for Service Delivery**

- Many of the inputs to these systems and plans have been identified during the production phase, this step within the service life cycle is more a formalization of approaches and management systems around the service
- Preparation will be based on the production expectations and service capabilities established again during production

### **SG3 – Deliver Services**

- The product has been developed with the service expectations (internal and external) in site – service delivery should be available with a shorter start up lag time
- Management systems should be easier to identify and start up (customer expectations are understood and internal budgeting for resources have been identified)
- Operations should be focused back to agreements and requirements that were identified during production

# Incident Resolution and Prevention (IRP)

## SG1 – Prepare for Incident Resolution and Prevention

- Incident definition needs to be established.
  - Definition should be based on expectations set during production
  - Differentiation of request versus incident – similar to any service start up
    - Differentiation should be defined within production context
- Establish Incident Management System
  - Resources and tools assigned to the management system based on analysis during production – Risk Management/Product Integration alignment

# Incident Resolution and Prevention (IRP) (continued)

## SG2 – Identify, Control, and Address Incidents

- Periodically as well as event drive – accommodate and plan to analyze incidents to avoid recurrence
- Critical to keep communication open with customers – integrated with Service System Transition when applicable
- May require returning to production phase if component selected during production is not repairable/ if functionality is in question
  - This areas could directly result in production issues being identified

# Incident Resolution and Prevention (IRP)



## (continued)

### **SG3 – Define Approaches to Address Selected Incidents**

- Identification of systemic incidents or incidents whose solution may not be appropriate for a component transition
  - Identification of these incidents may require customer communication for awareness/ workarounds/ loss of functionality etc

# Service System Transition (SST)

## SG2 – Deploy the Service System

- The plans should be in place for scheduled transition activities therefore deploying a refresh/warranty component etc is already in place
  - Unplanned transitions need to address SG1 again within the operational phase
- Assessing the transition
  - This activity may change the plan or cause a re-entry to production to reevaluate the selection of that component

# Service System Development (SSD)

## SG 3 – Verify and validate Service Systems

- Actual verification of the service system will not occur until the operational phase although the actual integration of the components and the service design can be accomplished during production phase
- Peer reviews should include production staff as service staff should have been included in verification activities during production
  - Both service and production are stakeholders in the product solution set

# Benefits, Benefits, Benefits...

- Product Integration coupled with Service System Transition
  - Internally – impact awareness for management/ configuration management/ test/ quality
  - Externally – confidence system will continue to operate
- Adding Service Continuity (a.k.a. System Continuity)
  - Customer and users MUST identify those requirements associated with critical functions
  - Test Engineers focus on system failure as well as individual component failures to test for continuous critical functionality
- Risk Management coupled with Capacity and Availability
  - Expands the focus from internal development to external operations
  - Bridges project evolution from production to sustainment

# Moral of the story

It is essential in this economy and environment that production needs to keep in mind that service of a product is a critical issue. The operational life cycle will indeed last a “life time” and it is imperative to give consideration to the requirements/ resources/ expectations of this phase as the product is being built.

- Encourage the use of CMMI – SVC as an extension to CMMI- DEV
- Proactively selecting process areas regardless of the constellation to meet customer needs
  - Multi-dimensional view of quality
  - Production and Operational life cycles supported

# ...And the Walls Come Tumbling Down



Questions??