

Software Quality Management

Standards & Processes

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#AdTekDev #ICoTek #VNASQ #VNSQA #VNSoftwareTesting

Outline

- ISOs
- IEEEs
- o TQM
- CMMi
- TMMi
- o ITIL
- CoBIT
- Kanban Lean TPS
- Kaizen
- o 6-Sigma : DMAIC DFSS



ISOs

Functionality

- Suitability
- Accuracy
- Interoperability
- Security

Reliability

- Maturity
- •Fault Tolerance
- Recoverability

Usability

- Understandability
- Learnability
- Operability

Efficiency

- •Time behavior
- Resource behavior

Maintainability

- Analyzability
- Changeability
- Stability
- •Testability

Portability

- Adaptability
- •Installability
- •Conformance
- Replaceability

MIL-Q-9858 (1959) BS 5750 (1974) ISO 9000: 1994 ISO 9000: 2008

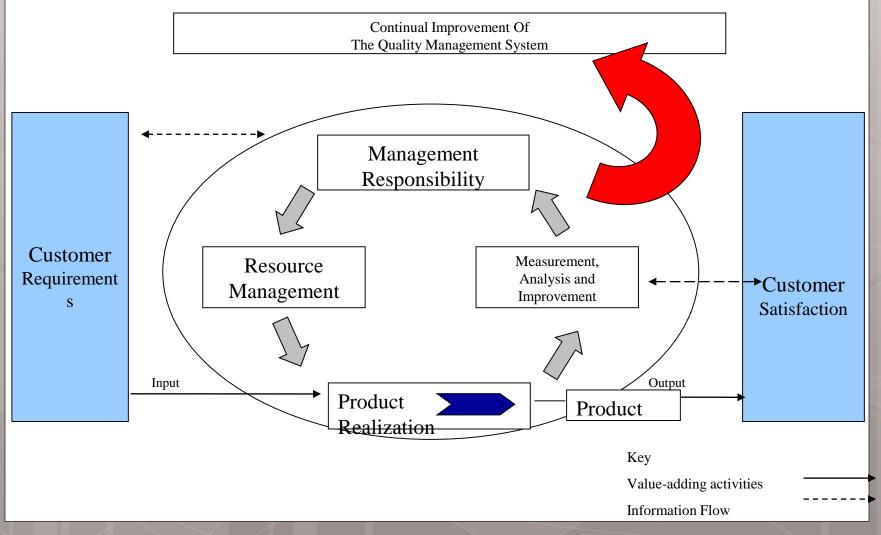




ISO 9000: 1987

ISO 9000: 2000

ISO 90003 – QMS Model



ISO & IEEEs

Standard Code	Standard
AECL CE-1001	Standard for Software Engineering of Safety Critical Software
BSI BS-7925-2 IEE 3	Standard for Software Component Testing Guidelines for Assuring Testability
ISO/IEC TR 15271	Guide for ISO/IEC 12207 - (Software Life Cycle Processes)
ISO/IEC 14102	Guideline For the Evaluation and Selection of CASE Tools
ISO/IEC 15408-1	Information technology Security techniques Evaluation criteria for IT security
IEEE 730	IEEE Standard for Software Quality Assurance Plans
IEEE 829	IEEE Standard for Software Test Documentation
IEEE 1008	IEEE Standard for Software Unit Testing
IEEE 1044	Classification for Software Anomalies
IEEE 1044.1	Guide to Classification for Software Anomalies

ISO & IEEEs

Standard Code	Standard	
IEEE 1012	IEEE Standard for Software Verification and Validation	
IEEE 1028	IEEE Standard for Software Reviews	
IEEE 1045	IEEE Standard for Software Productivity Metrics	
IEEE 1059	IEEE Guide for Software Verification and Validation Plans	
IEEE 982.1	IEEE Standard Dictionary of Measures to Produce Reliable Software	
IEEE 1061	IEEE Standard for a Software Quality Metrics Methodology	
ISO/IEC 27001	SO/IEC 27001 Information security management	
ISO/IEC TR 9126	R 9126 Software engineering Product quality	
ISO/IEC 250xx	Software engineering Software product Quality Requirements and Evaluation (SQuaRE)	
ISO/IEC 25010	/IEC 25010 (SQuaRE) System and software quality models	
ISO/IEC 25020	(SQuaRE) Measurement reference model and guide	
ISO/IEC 25030	(SQuaRE) Quality requirements	
ISO/IEC 25040	(SQuaRE) Evaluation guide for developers, acquirers and independent evaluators	

TQM

Counting

Tools, techniques, and training in their use for analyzing, understanding, and solving quality problems

Customers

Quality for the customer as a driving force and central concern.

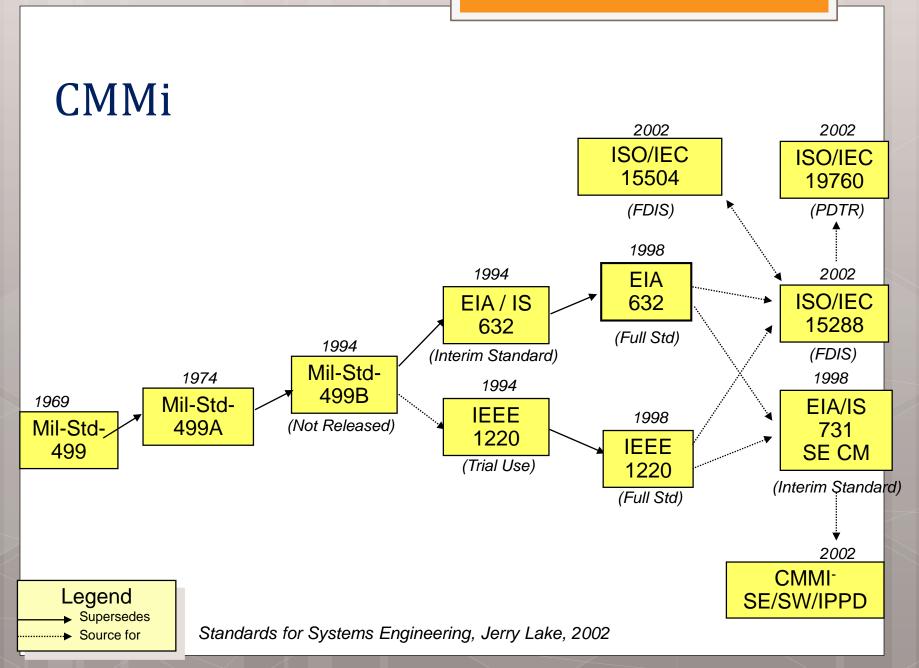
Culture

Shared values and beliefs, expressed by leaders, that define and support quality.

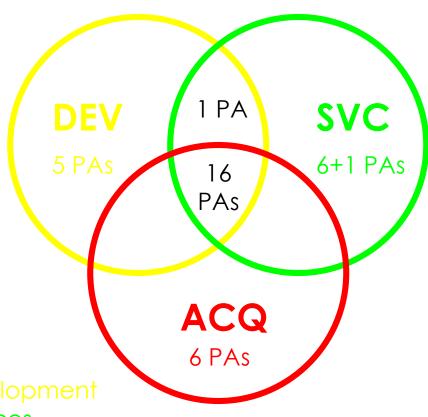
TQM

- 1. Focus on delivering customer value.
- 2. Continually improve systems and processes.
- 3. Focus on managing processes rather than people.
- 4. Use teams to continually improve.





CMMi



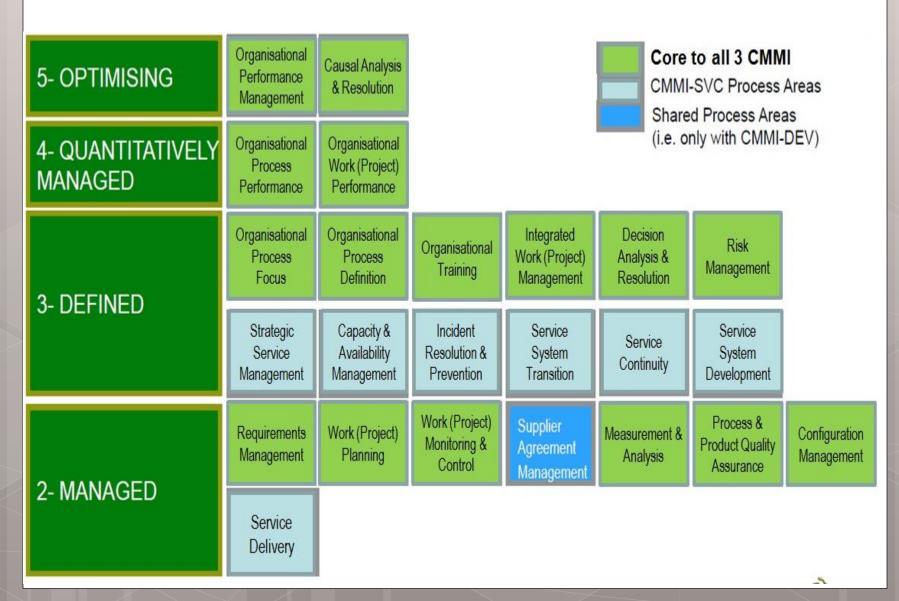
CMMI-DLV - Developine

CMMI-SVC - Services

CMMI-ACQ - Acquisition

CATEGORY

				Service Establishment and Delivery	Support
	5	5 · OID			• CAR
	4	• OPP	• QPM		
MATURITY LEVEL	3	• OPF • OPD* • OT	 IPM* RSKM Service Continuity Management (SCON) Capacity and Availability Management (CAM) 	 Strategic Service Management (STSM) Service System Transition (SST) Incident Resolution and Prevention (IRP) Service System Development (SSD) [ADDITION] 	• DAR
	2		• PP* • REQM • PMC • SAM*	• Service Delivery (SD)	• CM • PPQA • MA



TMMi



5)Optimization

Defect prevention
Test process Optimization
Quality control

4)Measured



Test measurement Software quality evaluation Advanced peer reviews

3)Defined



Test organization
Test training program
Test lifecycle & integration
Non-Functional Testing
Peer reviews

2)Managed



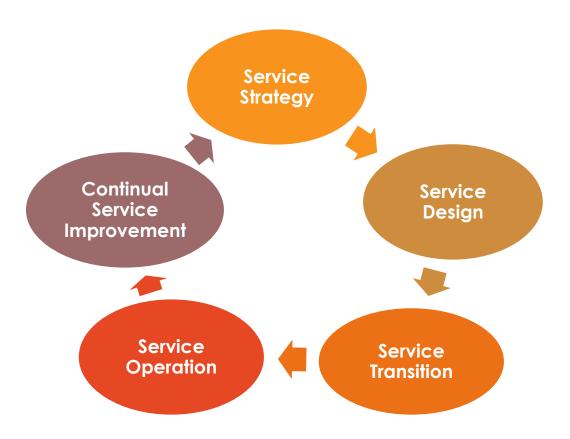


1)Initial

TMMi – CMMi

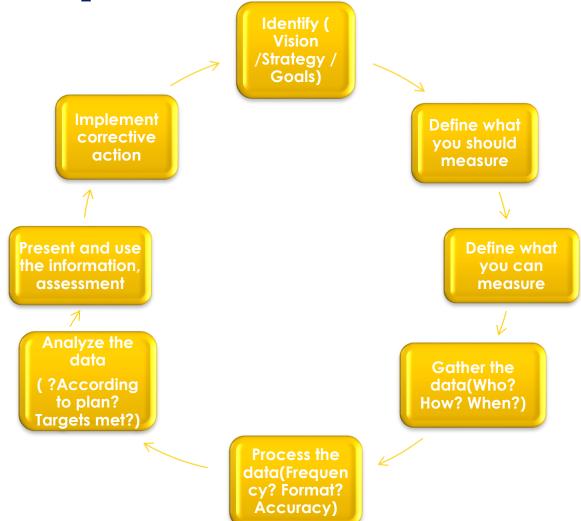
Level	Focus	Key Process Areas (CMMi Testing)	TMMI Level
5	Continuous Process	Improved Test Process	Defect Prevention
Optimizing	Improvement	Defect Management	Test Process Optimization Quality Control
4		Establish & measure testing process performance	
Quantitative Managed	Quantitatively Managed	Peer Reviews	Product Quality Evaluation
			Advanced Peer Reviews
3	Process	Standard template for test requirments collection	Test Organization
Defined		Integration test plans & schedule	Test Training Program
	Standardization	Testing Process	Test Life Cycle and Integration Non- Functional Testing
		Peer Reviews	Peer Reviews
2		Gathers Testing Requirements	Test Policy and Strategy
Managed	Basic Project Management	Testing Schedule	Test Planning
		Testing Execution	Test Monitoring and Control
	_	Testing Monitoring & Reporting	Test Design and Execution
1	Process is informal	No Process for Testing	Testing is a chaotic,
Initial	and Adhoc		Undefined process

ITIL



IT Operations Mgmt From ITIL V2 New in ITIL v3 **Applications Mgmt** Knowledge Mgmt. **Functions** Supplier Mgmt. Evaluation Service Catalog Mgmt. Request Fulfillment Service Validation and Testing Info Security Mgmt. Event Management Transition Planning and Support Access Management Strategy Generation IT Service Cont. Mgmt. Release and Deployment Mgmt. Problem Management Demand Mamt. Capacity Mamt. Service Asset Service Portfolio Incident Management Availability Mamt. and Config. Mgmt. Mgmt. Service Desk Financial Mamt. Service Level Mgmt. Change Mgmt. (Function) Service Service Service Service **Transition Operation** Strategy Design **Continual Service Improvement** 7-Step Improvement Process, Deming Cycle, CSI Model Service Reporting Service Measurement

ITIL – improvement



CoBIT

Control Objectives for Information and Related Technology

Resources

- -Data
- -Application systems
- -Technologies
- -Facilities
- -People



Processes

- 4 Major Domains
- -Plan & Organize
- -Acquisition & Implementation
- -Delivery & Support
- Monitoring



Business Requirements

- -Effectiveness
- -Efficiency
- -Confidentiality
- -Integrity
- -Availability
- -Compliance
- -Reliability

... COSO, ITIL, ISO 17799

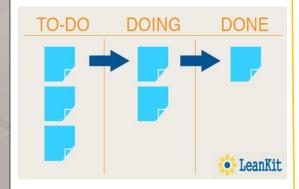
Kanban

Stop Starting things and Start Finishing them.

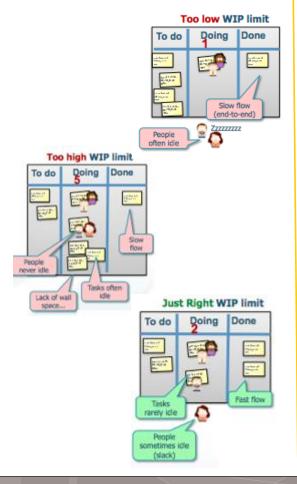


Kanban

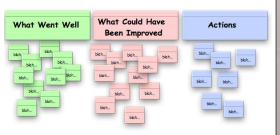
Visualize your Tasks



Minimize your WIP



Improve



Kaizen

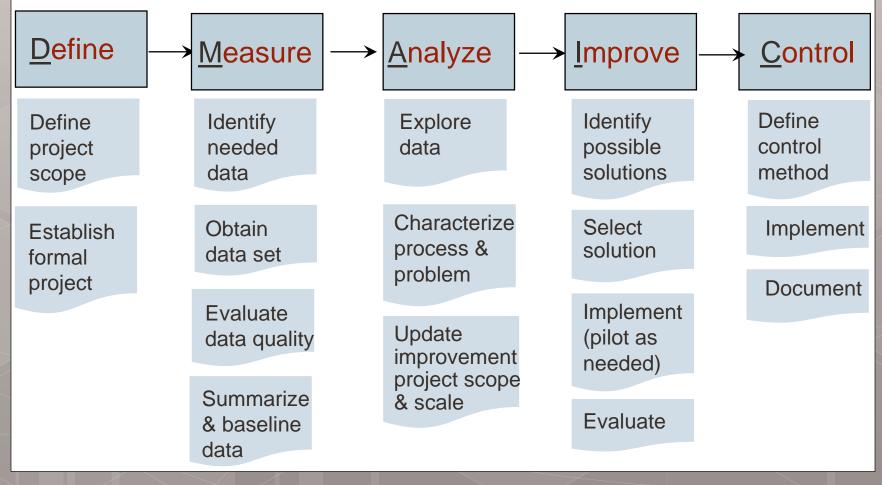
改善

- Eliminate waste (non value added activities)
- Increase productivity / output
- Reduce inventory (less material and labor)
- Reduce cycle time (less time to produce specific part)
- Reduce space (work cell, office area)
- Improve On-Time Delivery (OTD)
- Improve quality of product and process
- > Improve housekeeping, 5S and visual management
- Reduce downtime (setup time, maintenance)
- Reduce transport time and distance
- Standardize the process (less variation)
- Reduce operating costs

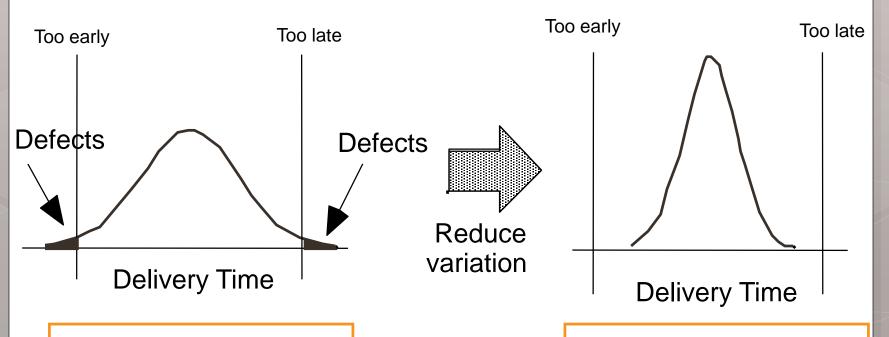
Kaizen Activities



6-Sigma: DMAIC – DFSS



LSS – Lean six sigma



Spread of variation too wide compared to specifications

Spread of variation narrow compared to specifications

Q/A ?!



