



CTG Testing Services

Test Release Management (entry & exit criteria)

KVIV – may 12th 2004
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Computer Task Group, Inc. 2004

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 - Test Coverage
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 - Milestone monitoring
 - Resource Tracking
- **COMMUNICATION & REPORTING (who)**

DEFINITION & PURPOSE



"What is Test Release Management?"

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DEFINITION & PURPOSE



How do you know when the software is ready to release?

How do you know when the software is ready to test?

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DEFINITION & PURPOSE



"If you don't know where you are, a map won't help" (Humphrey)

"If you don't know where you are going to, a map won't help either"

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DEFINITION & PURPOSE



- No matter how many resources there are consumed, no matter how many time is available, tests are never completed, you can always test more!
- Testing has to be stopped, whenever the release date is there!
- Less time in testing = less quality = more risks, but what risks? What level of quality?
- Release decision is based on gut feel: information used by management are the open defects and their severity
- No testing targets are set

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DEFINITION & PURPOSE



- **Added Value of structured testing?:**
 - Find Defects as early as possible (+ solve, Prevent, ...) : Yes
 - Reusable testware / Regression testing / gains in efficiency and effectiveness: Yes
- **But there is more:**
 - **Quality Advice & Project Intelligence:**
"information on the project or the release that enables management to take founded decisions on rational and objective data"

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DEFINITION & PURPOSE



"Project Intelligence"

- Are we able to take decisions based on objective facts and figures?
- Do we know where we want to go?
- Are we able to assess progress?
- Are we able to properly evaluate problems?

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DEFINITION & PURPOSE



NOTIONS:

Test Release Management:

Release Criteria:

Entry Criteria:

Exit Criteria:

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DEFINITION & PURPOSE



Release criteria?:

- Decision "Ready for test"? – entry criteria
- Decision "Ready to release" – exit criteria



- Objective and measurable (SMART)
 - Specific, measurable, attainable, relevant, trackable
- Reasonable
- Consensus
- Motivated decision
- Foundation for test strategy

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DEFINITION & PURPOSE



Purpose Test Release Management

Management Release criteria:

Deming circle: PLAN – DO – CHECK – ACT

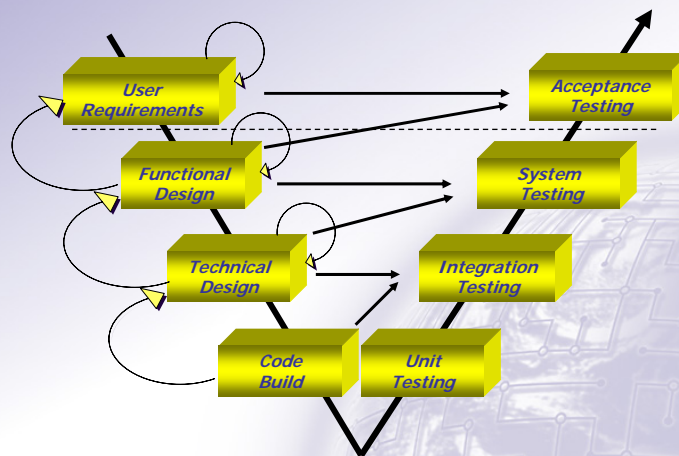
➔ CONTINUUM

DEVELOPMENT & TEST LIFE CYCLE

Test Release Management between Test Levels



V – model



DEVELOPMENT & TEST LIFE CYCLE

Test Release Management between Test Levels



TEST LEVELS:



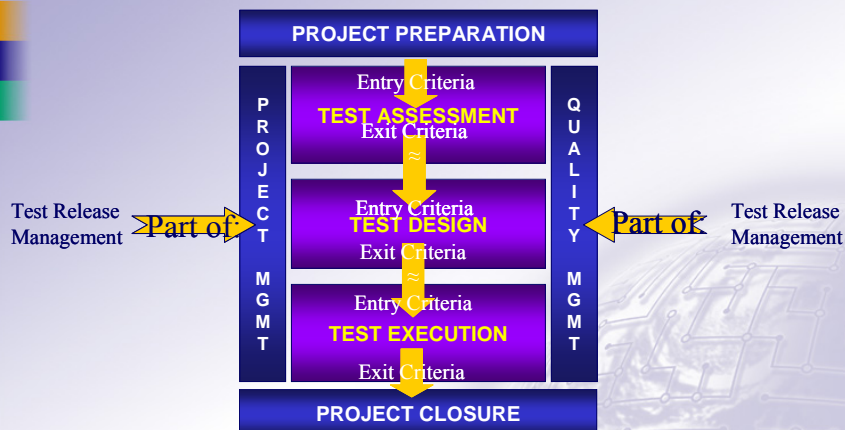
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DEVELOPMENT & TEST LIFE CYCLE

Test Release Management between Test phases



TEST PHASES: MILESTONES



Remark: how many test execution runs – regression runs?

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RELEASE CRITERIA



"Examples of Release Criteria?"

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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES: DEFECT TRACKING

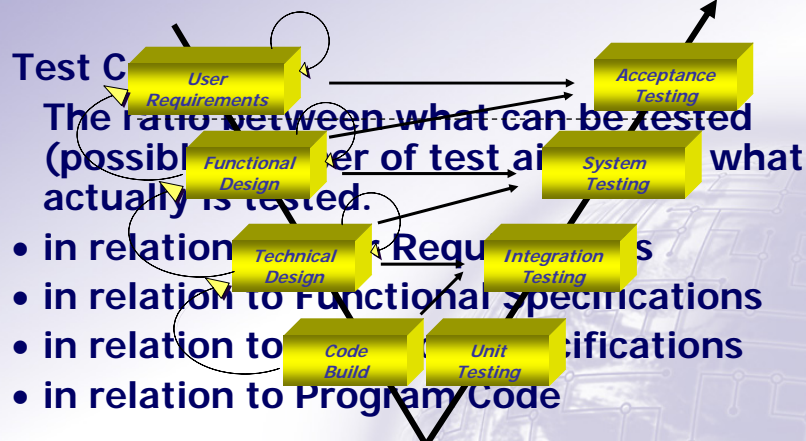
- NUMBER OF DEFECTS
- STATUS
- SEVERITY OF DEFECTS
- PRIORITY OF DEFECTS
- EVOLUTION OF NUMBER OF DEFECTS
 - FOUND
 - SOLVED
 - REGRESSION
- DEFECT DETECTION RATE, DEFECT REMOVAL RATE,
TIME TO REPAIR
- ...

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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES:
WORK PRODUCT TRACKING: TEST COVERAGE



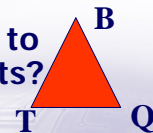
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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES:
WORK PRODUCT TRACKING: TEST COVERAGE

- Test Strategy : What Coverage do we want to reach in view of time and budget constraints?
- Test Release Management: What Coverage did we reach to decide to proceed to the next test level or production?



In other words : 
 PLAN – EXECUTE – MONITOR - ADJUST

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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES:
WORK PRODUCT TRACKING: TEST COVERAGE

HIGH LEVEL TEST STRATEGY

- DETERMINE HIGH LEVEL SUBSYSTEMS & PRIORITIES (Priority Matrix)

 Test Strategy

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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES:
WORK PRODUCT TRACKING: TEST COVERAGE

DETAILED TEST STRATEGY

DETERMINE TEST UNITS & PRIORITIES

- DEFINE:
 - Test Design Coverage to be reached
 - Test Execution Coverage to be reached
 - Passed Product to be reached

 Test Strategy

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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES: WORK PRODUCT TRACKING: TEST COVERAGE

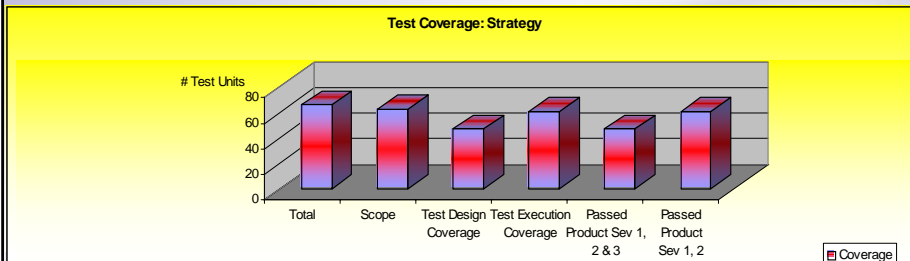
STRATEGY								
Subsystem	Test Unit	Priority	Total	Scope	Test Design Coverage	Test Execution Coverage	Passed Product Sev 1, 2 & 3	Passed Product Sev 1, 2
Functionaliteit			Functionaliteit					
Module A	Test Unit 1	2	v	v	v	v	v	v
	Test Unit 2	2	v	v	v	v	v	v
	Test Unit 3	4	v	x	x	x	x	x
	Test Unit 4	3	v	v	x	v	v	v
	Test Unit 5	2	v	v	v	v	v	v
	Test Unit 6	3	v	v	x	v	x	v
	Test Unit 7	2	v	v	v	v	v	v
Module B	Test Unit 8	3	v	v	x	v	x	v
	Test Unit 9	2	v	v	v	v	v	v
	Test Unit 10	2	v	v	v	v	v	v
	Test Unit 11	2	v	v	v	v	v	v
	Test Unit 12	2	v	v	v	v	v	v
	Test Unit 13	2	v	v	v	v	v	v
	Test Unit 14	2	v	v	v	v	v	v
Module C	Test Unit 15	4	v	v	x	x	x	x
	Test Unit 16	2	v	v	v	v	v	v
	Test Unit 17	3	v	v	x	v	x	v
	Test Unit 18	2	v	v	v	v	v	v
	Test Unit 19	2	v	v	v	v	v	v
	Test Unit 20	2	v	v	v	v	v	v
	Test Unit 21	2	v	v	v	v	v	v

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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES: WORK PRODUCT TRACKING: TEST COVERAGE



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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES: WORK PRODUCT TRACKING: TEST COVERAGE

TEST DESIGN COVERAGE

Priority 1:

Detailed Test Scenario's with profound test depth
(make use of formal test specification techniques)

• Priority 2:

High level Test Scenario's with normal test
depth (no use of formal test specification
techniques)

• Priority 3 / 4:

No test Scenario's to be made

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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES: WORK PRODUCT TRACKING: TEST COVERAGE

TEST EXECUTION COVERAGE

• Priority 1:

Test Scenario's to be executed in each test run (at least
two times: one first test run and one regression test run,
plus in case: extra test runs for retesting bugs)

• Priority 2:

Test Scenario's to be executed in at least one test run,
plus in case: extra test runs for retesting bugs)

• Priority 3:

Ad hoc Testing / Using error guessing technique

• Priority 4:

No test execution Coverage

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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES: WORK PRODUCT TRACKING: TEST COVERAGE

PASSED PRODUCT

The Test Units wherefore Test EXECUTION has taken place AND wherefore NO reported ERRORS remain in an OPEN Status

FLEXIBILITY CAN BE FORESEEN:

- Passed Product: no defects severity 1
- Passed Product: no defects severity 1 or 2
- Passed Product: no defects severity 1, 2 or 3

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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES WORK PRODUCT TRACKING: DOCUMENT TRACKING (DELIVERABLES & THEIR STATUS)

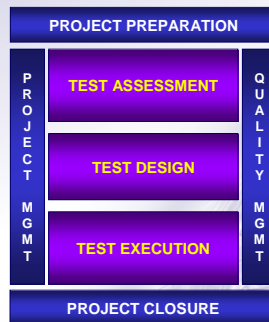
- **IN:**
 - TEST BASIS (user requirements, functional analysis, technical analysis, ...)
 - RELEASE NOTES
 - USER DOCUMENTATION
 - ...
- **OUT:**
 - TEST PLAN
 - TEST PROGRESS REPORT
 - INSPECTION REPORTS
 - TEST CASES & SCENARIOS
 - TEST EXECUTION LOGS
 - DEFECT REPORTS
 - TEST EVALUATION REPORT
 - ...

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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES WORK PRODUCT TRACKING: MILESTONE MONITORING

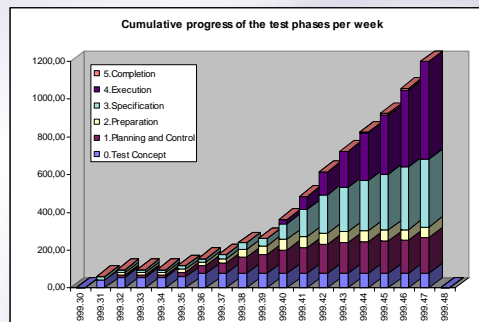
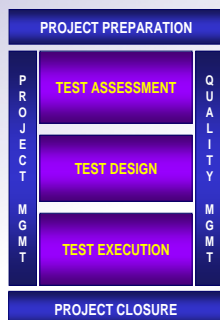


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Release Criteria: Metrics



ENTRY AND EXIT CRITERIA – CATEGORIES: RESOURCE TRACKING (TIME SPENT PER PHASE)



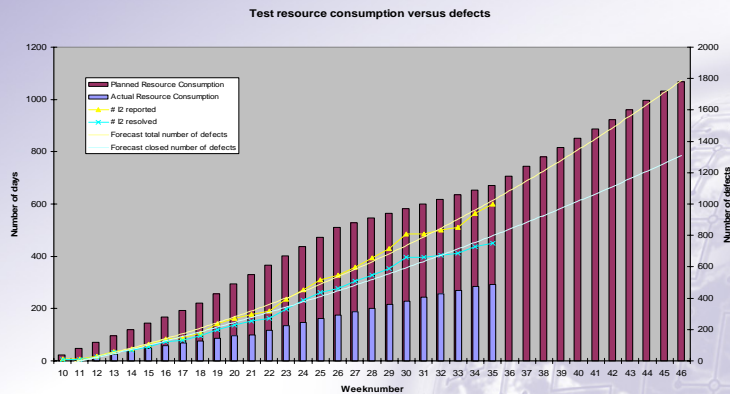
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Release Criteria: Metrics



RELATIONS:

- DEFECT TRACKING VERSUS TEST COVERAGE
- DEFECT TRACKING VERSUS RESOURCE TRACKING
- TEST COVERAGE VERSUS RESOURCE TRACKING



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COMMUNICATION & REPORTING



How can the release criteria be measured?

How can the release criteria be reported?

- What
- To whom (management, project team)
- When (how regularly)
- Where (intranet, mail, meeting,...)
- How (Dashboard?)

How will the release criteria be used, evaluated?

What will be done when entry / exit criteria are not met?

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COMMUNICATION & REPORTING



- Test Release information must be communicated:
 - On a regular basis
 - To the relevant stakeholders
 - Easy to interpret (Dashboard principle)
 - Cost efficient
 - Pragmatic
 - Two Directions
- Ideally:
 - One document
 - Different levels of detail for different stakeholders
 - Impact obvious and clear

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Process



- **STEP 1 : Conduct Impact Analysis (RISKS)**
(part of Test Strategy)
 - Determine:
 - Business risks
 - Complexity
 - Size
 - Test level (UIT – ST- AT)
 - Purpose of Iteration (early feedback & prototyping versus final version for production)

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Process



- **STEP 2: Agree on Targets for Entry and Exit Criteria (Satisfaction percentages,...)**
 - More flexible or more stringent targets depending on impact analysis
 - More flexible or more stringent targets depending on test level / test phase
 - Remark: Be pragmatic and realistic – what is critically important to the project?
 - Remark: Gain consensus (budget and time constraints!!) from management and project team!

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Process



- **STEP 2: Agree on Targets for Entry and Exit Criteria (Satisfaction percentages,...)**
 - Examples Entry / Exit Criteria:
 - Documentation from Development / System Testing
 - Test Infrastructure
 - Life Cycle (Milestone planning)
 - Product Completeness (of increment scope)
 - Number of Test Defects (per priority)
 - Development / System Test Coverage

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Process



- **STEP 2: Agree on Targets for Entry and Exit Criteria (Satisfaction percentages,...)**
 - **Concrete Examples:**
 - Example exit criterion acceptance testing: the percentage of all open defects (related to total found) with severity 2 may not exceed 1%.
 - Example entry criterion test assessment phase: User Requirements document must have been approved by the user representative
 - Example entry criterion acceptance testing level: passed product system testing must be at least 90%.

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Process



- **STEP 2: AGREE ON TARGETS FOR ENTRY AND EXIT CRITERIA (Satisfaction percentages,...)**
 - **Concrete Examples:**

Coverage		
Total		60
Scope		60
Out of scope		3
Scope	dep te testen	50
	na testen	70
	door te lopen	22
Test Specification Coverage		75
Test Execution Coverage		87
Passed Product		97

Bevindingen		
Aantal openstaande bevindingen	Business Blocking	geen
	Not Business Blocking	geen
	Nice to have	geen rekening mee houden
Max. aantal bevindingen gevonden in de laatste week testsubsequentie	Business Blocking	geen
	Not Business Blocking	geen
	Nice to have	geen rekening mee houden
absolute aantal openstaande fouten	Business Blocking	geen in de laatste week testsubsequentie
	Not Business Blocking	3 weken achtermeemakend daling
	Nice to have	geen rekening mee houden

Deliverables	
User Requirements	gevalideerd door de ontwikkelaars
Functionale Analyse	gedetailleerde checklist + gevalideerd door de gebruikers
Technische Analyse	intern gevalideerd door de ontwikkelaars
Testplan	gevalideerd door de ontwikkelaars en gebruikers
Testscenario's	intern gevalideerd door de gebruikers
afsluiting	2 volledige testruns, 1 testrun voor de openstaande bevindingen
Testrapport	gevalideerd door gebruikers

Aantal maanden	
Aantal maanden gebruikt	< 80% aantal maanden voorzien

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Process



- **STEP 2: AGREE ON TARGETS FOR ENTRY AND EXIT CRITERIA (Satisfaction percentages,...)**

- **Concrete Examples:**

	Yes	No	Impact
Operational critical?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	High
Development Complex	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Test Complex	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Modification Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Functional / Engineering Modifications	Bug Fixing	

Early feedback and test preparation	Level 1 Mandatory
System Testing	Level 2 Mandatory
System Testing & Acceptance Testing	Level 3 Mandatory
System Testing, Acceptance Testing & Operations	Level 4 Mandatory

For formulas and parameters, press +

	Not Satisfied	Waved	Satisfied
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Process



- **STEP 3 : Determine Metrics**
 - Determine how the criteria can be measured
 - Determine how they will be reported
 - What
 - To whom (management, project team)
 - When (how regularly)
 - Where (intranet, mail, meeting,...)
 - How (Dashboard?)
 - Determine how they will be used, evaluated
 - Determine what will be done when entry / exit criteria are not met

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Process



- **STEP 4: Follow Up on a regular basis and adjust**
 - Interpret figures and trends
 - Check whether you are on schedule or not
 - Check why you are on schedule or not
 - Ask if you can do something about it or not
 - Ask if any one else can do something about it or not
 - Inform stakeholders regularly about the risks

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Process



- **STEP 5: Take Action where necessary**
 - Redefine priorities
 - Redefine resource allocation
 - Redefine timeline, milestones and deadlines
 - Redefine task distribution
 - Return software to Development Division if entry criteria not met
 - Postpone start Acceptance testing if exit criteria System testing not met
 - Postpone Deployment (or part of deployment) if acceptance exit criteria not met
 - ...

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Process



- **STEP 6: Re-Evaluate Release Criteria**

- Check if the correct release criteria are chosen
- Check whether the targets set are realistic
- Check if they are correctly understood by all stakeholders involved

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