

TPI® 기반의 테스트 프로세스 개선사례

2004. 10.

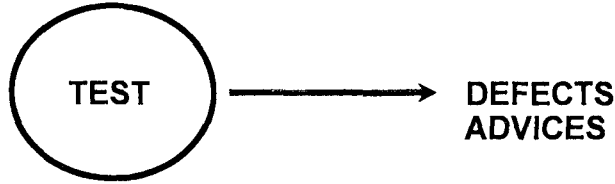
삼성 SDS/SE Automation팀

이남희 Ph.D./CSQE

목차

1. 테스트 프로세스 모델의 필요성
2. TPI® 모델 소개
3. 모델 활용 사례

1. Testing?

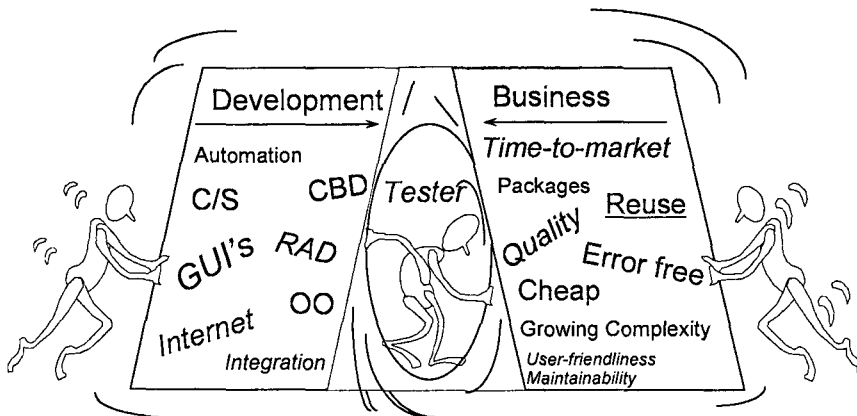


- Informing about quality & risks
- Delivering re-usable testware
- Preventing defects

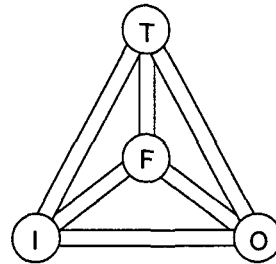
- *Improving the test process*

No risk, No test

1.1. Testing under pressure



1.2. Required: *structure*



What, when?

Life-cycle

How?

Techniques

Where, etc.?

Infrastructure and Tools

Who?

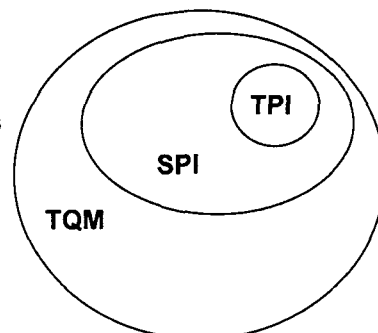
Organization

1.3. Test Process Improvement!

“Continuous improvement of the quality and the efficiency of the test process, related to the output of the total software process”

- Quality
- Costs
- Lead time

Insight
Coverage
Control
Timeliness
Cheaper
Faster



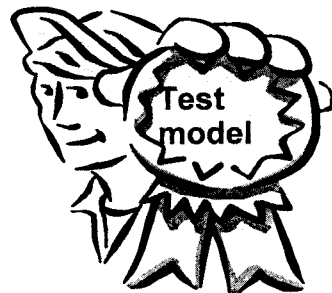
1.4. Improvement life-cycle in general

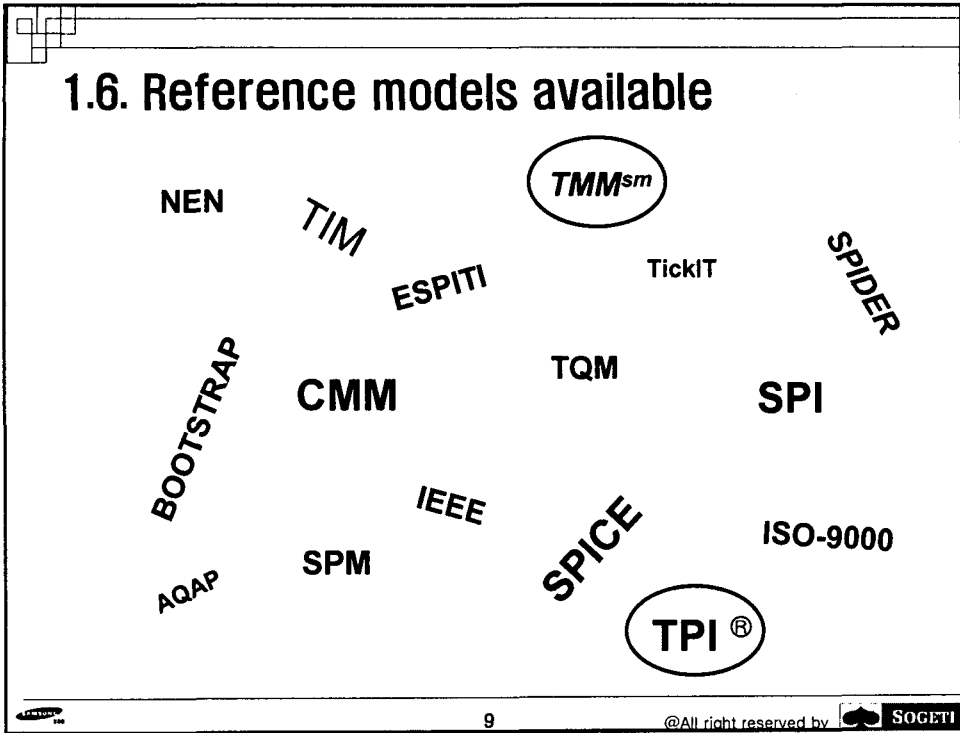
- Goal and scope
- Current situation
- Desired situation
- Implementing changes

**Required:
reference model**

1.5. Model requirements

- Controlled improvement steps
- Practical
- As objective as possible
- Options and priorities
- Highly detailed
- Fast assessment
- Independent

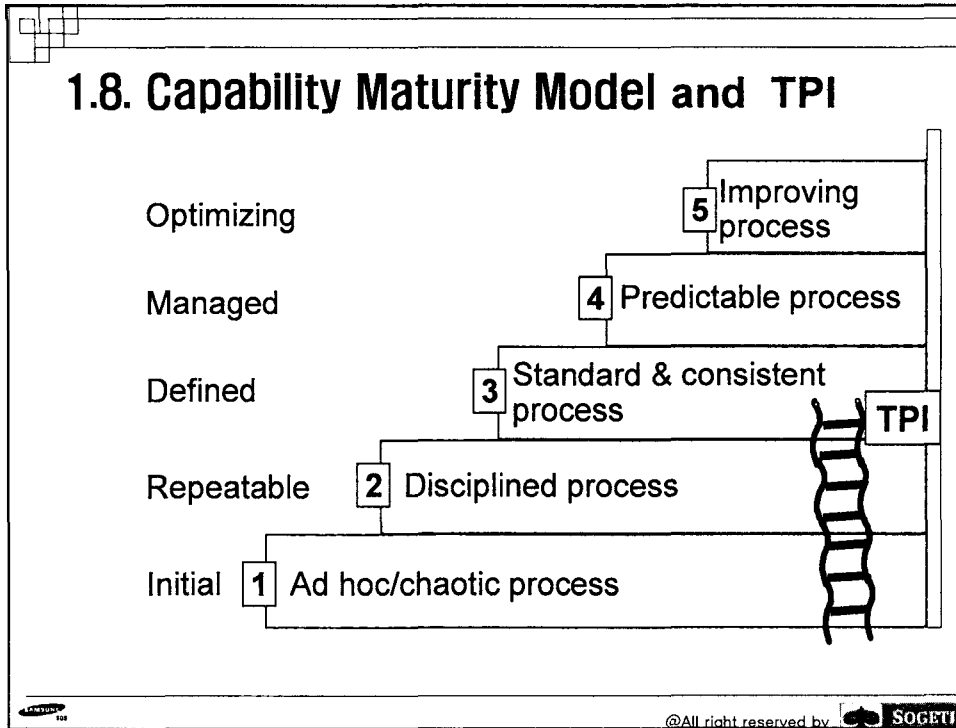




1.7. Similarity and difference TMMsm – TPI[®]

<p>TMMsm :</p> <ul style="list-style-type: none"> • Covering many aspects of test process • Staged • Fixed levels <li style="padding-left: 20px;">- Score per level • 13 process areas • Maturity goals per level • Dependencies in levels • Limited availability • Focussed on assessment 	<p>TPI[®] :</p> <ul style="list-style-type: none"> • Covering many aspects of test process • Continuous • Flexible levels <li style="padding-left: 20px;">- Score per area • 20 process areas • Maturity goals per process area • Dependencies in process areas • Public domain • Focussed on improvement
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1.9. About TPI

- Books and website
- Worldwide application
- User groups
- Change Control Board
- TPI service suppliers
- Users e.g.:

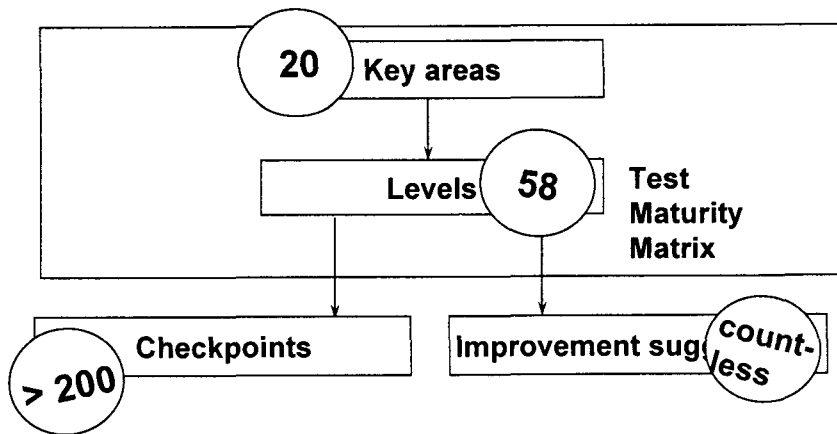
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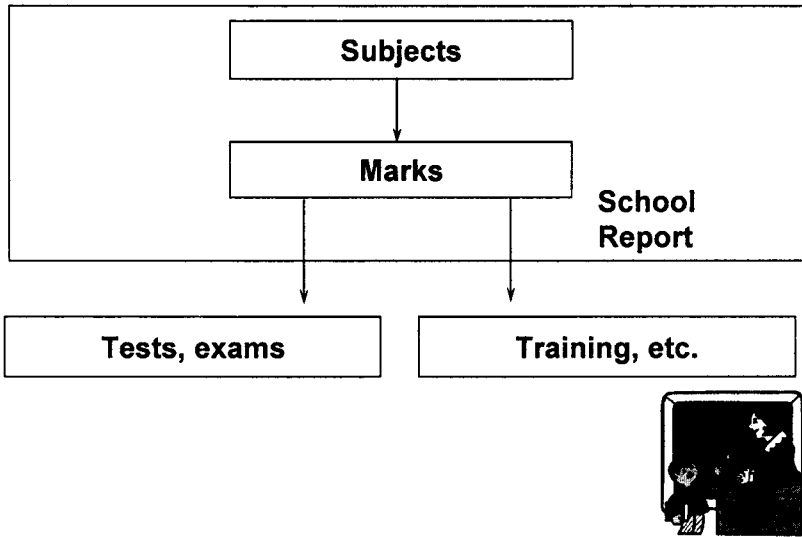
목차

1. 테스트 프로세스 모델의 필요성
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2. The TPI® model

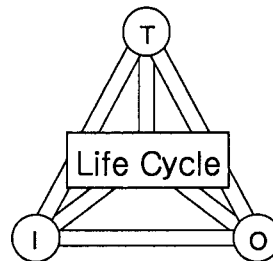



2. Metaphor TPI model



2.1. 20 Key areas

- Test strategy
- Life-cycle model
- Moment of involvement








2.1. Test strategy

Aim: To detect the most important defects
as soon as possible at the lowest price!

Dependencies:



- Risks
 - business
 - project
 - test
- Quality attributes
- Available resources
- Relative importance test levels

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2.1. Test strategy

- **Procedure: 6 Steps**
 - Selection of quality characteristics
 - Relative importance of quality characteristics
 - System divided into subsystems
 - Relative importance of subsystems
 - Test importance per subsystem and quality characteristic
 - Selection of test specification techniques and testing depth

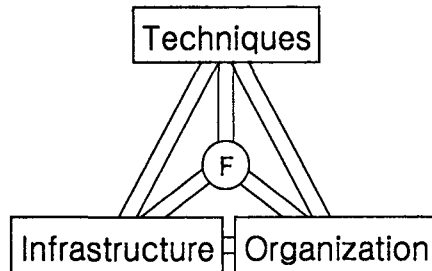
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2.1. 20 Key areas

- Estimating and planning
- Test specification techniques
- Static test techniques
- Metrics

- Test automation
- Test environment
- Office environment

- Evaluation
- Low-level testing



- Commitment and motivation
- Test functions and training
- Scope of methodology
- Communication
- Reporting
- Defect management
- Testware management
- Test process management

2.2. Levels : Test strategy

Levels:

- A) Strategy for single high-level test
- B) Combined strategy for high-level tests
- C) Combined strategy for high-level tests plus low-level tests or evaluation
- D) Combined strategy for all test and evaluation levels

2.2. Levels

Key area	Levels	A	B	C	D
Test strategy		Strategy for single high-level test	Combined strategy for high-level tests	Combined strategy for high-level tests plus low-level tests or evaluation	Combined strategy for all test and evaluation levels
Life-cycle model		Planning, Specification, Execution	Planning, Preparation, Specification, Execution, Completion		
Moment of involvement		Completion of test basis	Start of test basis	Start of requirements definition	Project initiation
Estimating and planning		Substantiated estimating and planning	Statistically substantiated estimating and planning		
Test specification techniques		Informal techniques	Formal techniques		
Static test techniques		Inspection of test basis	Checklists		
Metrics		Project metrics (product)	Project metrics (process)	System metrics	Organisation metrics (>1 system)
Test automation		Use of tools	Managed test automation	Optimal test automation	
Test environment		Managed and controlled environment	Testing in most suitable environment	Environment on call	
Office environment		Adequate and timely office environment			
Commitment and motivation		Assignment of budget and time	Testing integrated in project organisation	Test-engineering	

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2.2. Levels

Key area	Levels	A	B	C	D
Test functions and training		Test manager and testers	(Formal) Methodical, technical and functional support, management	Formal internal Quality Assurance	
Scope of methodology		Project specific	Organisation generic	Organisation optimising (R&D)	
Communication		Internal communication	Project communication (defects, change control)	Communication within the organisation about the quality of the test processes	
Reporting		Defects	Progress (status of tests and products), activities (costs and time, milestones), defects with priorities	Risks and recommendations, substantiated with metrics	Recommendations have a Software Process Improvement character
Defect management		Internal defect management	Extended defect management with flexible reporting facilities	Project defect management	
Testware management		Internal testware management	External management of test basis and test object	Reusable testware	Traceability system requirements to test cases
Test process management		Planning and execution	Planning, execution, monitoring, and adjusting	Monitoring and adjusting within organisation	
Evaluation		Evaluation techniques	Evaluation strategy		
Low-level testing		Low-level test life-cycle: planning, specification and execution	White-box techniques	Low-level test strategy	

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2.3. Checkpoints : Test strategy

Level A: Strategy for single high-level test

Checkpoints:

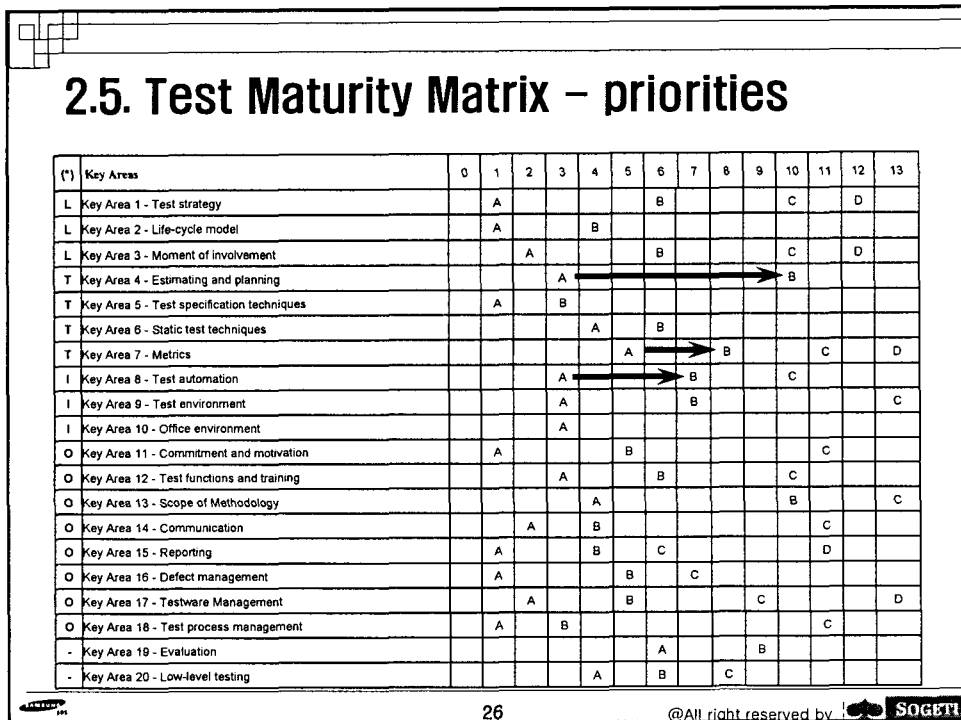
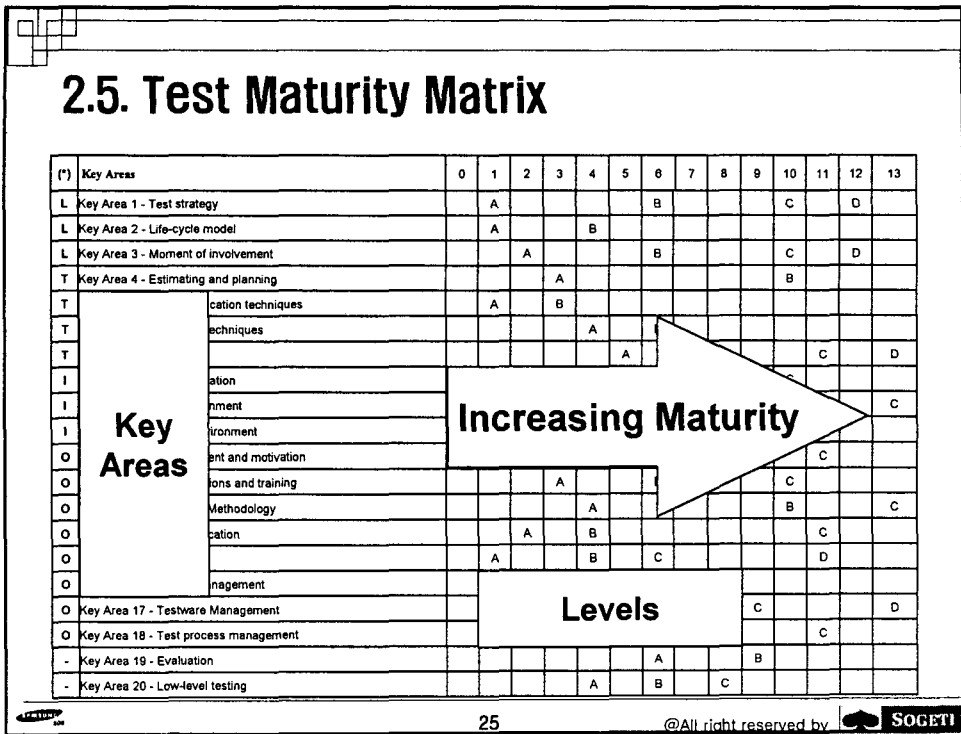
- Motivated consideration of product risks
- Differentiation in test depth (subsystems, quality characteristics), depending on the risks
- > 1 specification techniques are used, suited to the required depth of a test
- Re-test also have a (simple) strategy determination

2.4. Improvement suggestions : Test strategy

Level A: Strategy for single high-level test

Improvement suggestions (from 0 --> A):

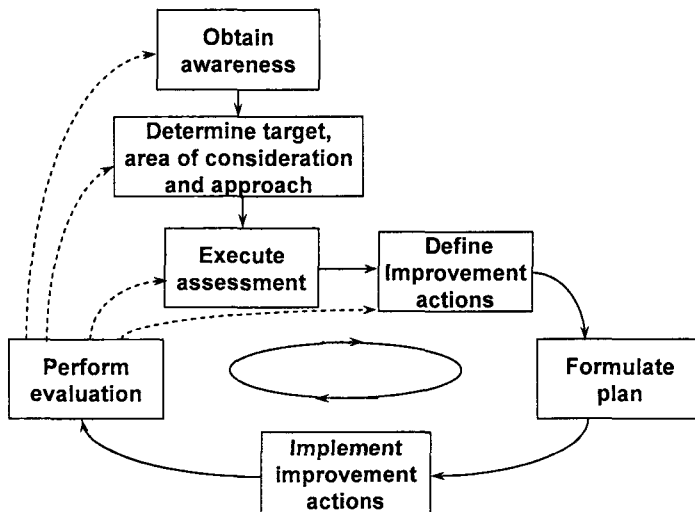
- If only 1 test specification technique is available, make simple variants, which give either more or less test depth
- Define a retest strategy in which a consideration of a full retest, a 'thin' retest or even no retest is motivated
- Distinguished subsystems and quality characteristics: assign relative importance
- To keep test lead time as short as possible: 'tiled' testing



2.5. Test Maturity Matrix – dependencies


(*) Key Areas	0	1	2	3	4	5	6	7	8	9	10	11	12	13
L Key Area 1 - Test strategy		A					B				C		D	
L Key Area 2 - Life-cycle model		A			B									
L Key Area 3 - Moment of involvement			A				B				C		D	
T Key Area 4 - Estimating and planning				A							B			
T Key Area 5 - Test specification techniques		A		B										
T Key Area 6 - Static test techniques					A		B							
T Key Area 7 - Metrics						A		B			C		D	
I Key Area 8 - Test automation				A			B				C			
I Key Area 9 - Test environment				A				B						C
I Key Area 10 - Office environment				A										
O Key Area 11 - Commitment and motivation		A				B						C		
O Key Area 12 - Test functions and training				A			B				C			
O Key Area 13 - Scope of Methodology					A						B		C	
O Key Area 14 - Communication			A		B							C		
O Key Area 15 - Reporting		A			B		C					D		
O Key Area 16 - Defect management		A				B		C						
O Key Area 17 - Testware Management			A			B				C			D	
O Key Area 18 - Test process management		A		B							C			
- Key Area 19 - Evaluation							A			B				
- Key Area 20 - Low-level testing					A		B		C					

2.6. Process of change




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3.1. Current situation – SDS 공공 프로젝트 ('04.3)

		0	1	2	3	4	5	6	7	8	9	10	11	12	13
(*)	Key Areas	Controlled				Efficient				Optimizing					
L	Key Area 1 - Test strategy		A					B				C		D	
L	Key Area 2 - Life-cycle model		A			B									
L	Key Area 3 - Moment of involvement			A				B				C		D	
T	Key Area 4 - Estimating and planning				A							B			
T	Key Area 5 - Test specification techniques		A		B										
T	Key Area 6 - Static test techniques					A		B							
T	Key Area 7 - Metrics						A			B			C		D
I	Key Area 8 - Test automation				A				B			C			
I	Key Area 9 - Test environment				A				B						C
I	Key Area 10 - Office environment				A										
O	Key Area 11 - Commitment and motivation		A				B						C		
O	Key Area 12 - Test functions and training				A			B				C			
O	Key Area 13 - Scope of Methodology					A						B			C
O	Key Area 14 - Communication			A		B							C		
O	Key Area 15 - Reporting		A			B		C					D		
O	Key Area 16 - Defect management		A				B		C						
O	Key Area 17 - Testware Management			A			B				C				D
O	Key Area 18 - Test process management		A		B								C		
-	Key Area 19 - Evaluation							A			B				
-	Key Area 20 - Low-level testing					A		B		C					

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3.2. Destination situation – SDS 공공 프로젝트 ('04)

(*)	Key Areas	0	1	2	3	4	5	6	7	8	9	10	11	12	13
				Controlled				Efficient				Optimizing			
L	Key Area 1 - Test strategy		A					B				C		D	
L	Key Area 2 - Life-cycle model		A			B									
L	Key Area 3 - Moment of involvement			A				B				C		D	
T	Key Area 4 - Estimating and planning				A								B		
T	Key Area 5 - Test specification techniques			A		B									
T	Key Area 6 - Static test techniques					A		B							
T	Key Area 7 - Metrics						A			B			C		D
I	Key Area 8 - Test automation				A				B			C			
I	Key Area 9 - Test environment				A				B						C
I	Key Area 10 - Office environment					A									
O	Key Area 11 - Commitment and motivation		A					B						C	
O	Key Area 12 - Test functions and training				A				B				C		
O	Key Area 13 - Scope of Methodology					A							B		C
O	Key Area 14 - Communication			A		B								C	
O	Key Area 15 - Reporting		A			B		C						D	
O	Key Area 16 - Defect management		A				B		C						
O	Key Area 17 - Testware Management			A			B					C			D
O	Key Area 18 - Test process management		A		B									C	
-	Key Area 19 - Evaluation							A			B				
-	Key Area 20 - Low-level testing					A		B		C					

3.3. Improvement actions

- **Reporting, (Communication, Defect management)**
 - 결함관리 강화
 - '04.03 ~
- **Commitment and motivation, (Test functions and training)**
 - 테스트교육 강화
 - '04.03 ~
- **Test strategy, Life-cycle model, (Test specification techniques)**
 - 방법론 개정
 - '04.06 ~
- **Others**
 - Static test techniques
 - 인스펙션 강화
 - '04.04 ~
 - Test automation
 - CTIP 및 성능테스트 강화
 - '04.05 ~

4. Conclusion

