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**Smart Media**  
KOREAN INSTITUTE OF SMART MEDIA



## Poster Presentation 2

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## A Study on improving the analysis of common elements on TMMi and TPI NEXT

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**Abstract.** In our previous study on a Correlative Maturity Between TMMi and TPI next[1], the correlation analysis method is a mapping with KPA on the empirical practice, but is insufficient. In this paper, we analyze correlation and intention across the measures. With the analysis result, we propose test process improvement method for TMMi assessed organization using hybrid analysis in software engineering.

**Keywords:** TMMi, TPI next, Information Engineering, Clustering, Key Process Area (KPA)

### 1 Introduction

Testing Maturity Model (TMM) and TMMi is used to assess the testing maturity level, and improve testing capability[2][3][4]. But assessing test activities, and complementing Capability Maturity Model (CMM) is not enough to improve test process, so TPI, and TPI NEXT was offered by Sogeti. However, applying TMMi and TPI NEXT requires much resources.

We tried to map the elements of TMMi and TPI NEXT with correlation analysis. In "The Study On a Correlative Maturity Between TMMi and TPI NEXT [1]", our method was based on experience, so basic of mapping analysis is insufficient. In this paper we propose the guide of test process, using mapping rules, correlation analysis, and clustering analysis in information engineering.

### 2 Related Works

The TMM was based on the CMM, and developed by the Illinois Institute of Technology. Just like the CMMi, the TMM also uses the concept of maturity levels for process evaluation and improvement. The TMMi framework has been developed by the TMMi Foundation as a guideline and reference framework for test process improvement and is positioned as a complementary model to the CMMi Version 1.2.



The TMMi model required and expected elements can be summarized to illustrate their relationship as in Fig 1.

Unlike the TMMi has been developed to support organizations with evaluating and improving their test process, the TPI NEXT model offers insight in the 'maturity' of the test processes within your organization. The TPI NEXT model is the improved model of TPI. (Fig 1)

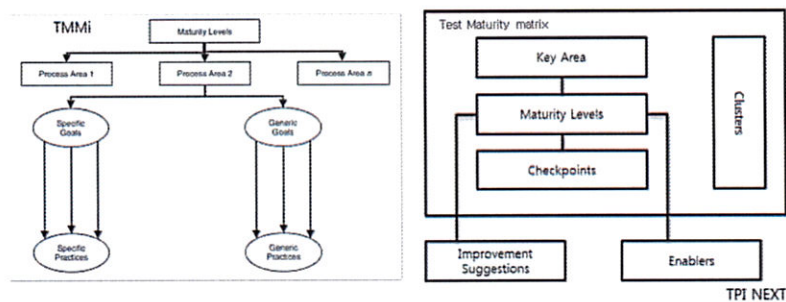


Fig. 1. TMMi Framework & The Elements of the TPI NEXT

Information Engineering (IE), developed by James Martin, is the application of an interlocking set of formal techniques for the planning, analysis, design, and construction of information systems on the enterprise wide basis or across a major sector of the enterprise. IE progresses in a top down fashion through the following stages: enterprise strategic systems planning; enterprise information planning; business area analysis; system design; construction.

### 3 TMMi mapping with TPI NEXT

We have studied how to derive common elements of TMMi and TPI NEXT to improve the test process. Deriving common elements of the two models were based on keywords and experience, so the mapping between the two models was not 100% complete. To solve this problem, we applied the mapping rule, and correlation analysis.

#### 3.1 Structure analysis of mapping model

TMMi and TPI NEXT have different purpose, so we cannot derive the correlation analysis using simple keyword analysis. Our analysis result is the follows:

- The Specific Practice of TMMi and Check Point of TPI NEXT have similar information levels, so the mapping is possible
- All elements cannot be mapped 1:1
- There is difference in relevance of mapped elements

### 3.2 Mapping rules and correlation analysis

We obtain more systematic mapping rules through the correlation analysis method:

- 1) Mapping rules
  - Compare keywords
  - Map elements (Specific Practice, Check Point) including meaning of higher level concept (Process Area, Level)
  - Review individually mapped elements
- 2) Correlation analysis method

Table 1. Mapping process through the correlation analysis

Correlation score	Analysis result	Mapping process
0	No relation	Exclude from the common elements
1~2	Little relation	Exclude from the common elements
3	Same relation	Include in the common elements
4~5	High relation	Include in the common elements

- 3) Evaluation rules
  - In comparison, an element of TMMi means more comprehensive than an element of TPI NEXT
  - In comparison, an element of TPI NEXT means more comprehensive than an element of TMMi
  - In comparison, an element of TPI NEXT and an element of TMMi has a same meaning

The elements of TMMi and TPI NEXT do not map one to one, and some elements do not have a common factor.

Key Area	Level	Seq	Mapping(TMMi Level2)
			TMMi (Score) : Specific Practice
Stakeholder commitment (SHC)	C	1	PA2.1-SG1-SP3(3) : Distribute the test policy to stakeholders PA2.1-SG2-SP3(5) : Distribute the test strategy to stakeholders PA2.2-SG4-SP3(3) : Plan stakeholder involvement PA2.3-SG1-SP5(2) : Monitor stakeholder involvement
		2, 3, 4	...

Fig. 2 Mapping result of TMMi and TPI NEXT

### 3.3 Clustering analysis

We used clustering analysis in information engineering by James Martin. TMMi list activities of organization according to the Key Process Area (KPA), we list test activities as the sequence of testing process using clustering analysis.

#### 4 Improve test process

We derived common elements, and identified the activities in each step. We applied the mapping model to a organization, which was preparing TMMi(level 2) assessment. Fig 3 is the test plan.

TEST PROCESS		TEST PLAN																			
TMMi(SP)	TPI NEXT	PA2.1	PA2.1	PA2.1	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.2	PA2.1
		-SG1- SP1	-SG1- SP2	-SG2- SP2	-SG2- SP3	-SG2- SP4	-SG2- SP5	-SG3- SP2	-SG3- SP3	-SG4- SP1	-SG4- SP2	-SG4- SP3	-SG4- SP4	-SG4- SP5	-SG5- SP1	-SG5- SP2	-SG5- SP3	-SG5- SP4	-SG5- SP5	-SG5- SP1	-SG5- SP2
Stakeholder commitment (SHC)	1																				
	2																				
	3																				
	4																				
	5																				
	6																				

Fig. 3 Test Process Improvement of Test Plan Phase

#### 5 Conclusion

TMMi model only measures the maturity of a testing organization, and we should prepare from scratch even if we apply another assessment model. We propose a guide to test process of TMMi (level 2) and TPI NEXT. In this procedure, we map the elements of TMMi model and TPI NEXT, and define guide of the activities in each level. In the near future, we need to map the elements of TMMi (level 3 - level 5) and TPI NEXT, and analyze the result according to the developed guide.

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