Transforming organizations to achieve TMMi certification

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Abstract

As the saying goes “Rome wasn't built in a day”, it takes a significant amount of effort for organizations to improve their testing practices to achieve various maturity levels. It requires rigor to follow these practices consistently across all programs. And even though testing consumes a significant part of the overall project cost, less focus is paid to testing.

To bridge the gap for organizations to become TMMi certified at particular levels, Suresh Chandra Bose, an Accredited TMMi Lead Assessor, provides insight into how to implement the specific and generic practices required. This paper will explain: the initial assessment of current testing practices and processes against the desired TMMi maturity level, build a recommendations roadmap, point out the organizational change management required to address gaps between the current and target end state, all while taking into consideration tactical and strategic opportunities to achieve TMMi and process improvement journey.

In conclusion, the results of the proposed solution roadmap show how an organization which was once ad hoc - can transform into a managed, defined, measured, and optimized one. This improves the effectiveness of testing through benchmarking of its test practices, while achieving the only recognized test maturity model certification available in the industry.

Biography

Suresh Chandra Bose, Ganesh Bose is a Manager - Consulting at Cognizant Business Consulting practice. Suresh is an accredited Lead Assessor from TMMi Foundation and has been in the IT Industry for more than 17 years with vast consulting experience in various industries. He has executed strategic initiatives for many Fortune 100 companies in the areas of PMO, PPM, Process Consulting, Program Management, TMMI Assessment/Implementation, Organization Strategy, Test Consulting and CIO/Governance Dashboard/Metrics across the globe.

Suresh holds 17 International certifications in IT and speaks at numerous international conferences, such as the American Software Testing Qualifications Board (ASTQB) and the Pacific Northwest Software Quality Conference (PNSQC). He is also on the selection and review committee for one of the leading testing conferences.

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1 Introduction to TMMi

- TMMi is “Test Maturity Model integration”
- Developed by the TMMi Foundation
- Contains guidelines and framework for test process improvement
- Has five maturity levels for process evaluation in systems and software engineering
- Addresses cornerstones of structured testing: lifecycle, techniques, infrastructure and organization
- Provides a detailed model for test process improvement
- Positioned as being complementary to CMMi
- Performs assessment considering the level at which an organization wants to be appraised
- By far the most popular model in the industry for benchmarking testing practices

![TMMi Maturity Levels](image)

2 Need for TMMi Assessment

The reasons why organizations can benefit from a TMMi assessment are many and can be broadly grouped as follows:

- Integration of industry best practices with the testing process to achieve business objectives
- As IT is getting more complex, there is a need to show value to our customers
- Evaluating the current testing process against Industry standards to enhance credibility in marketplace (benchmarking)
- Standardizing and optimizing the testing process along with a higher degree of process compliance
• Assess efficiency of support functions like Environment, Test Data, Build Management, Non-Functional Testing, etc., for testing activities

• Effective monitoring and control mechanism to mitigate schedule and cost overruns and quality issues

3 Comparison - CMMi and TMMi

Though TMMi is positioned as being complementary to CMMi and follows the same structure outlined by CMMi, there are some significant differences between the two. Figure 2 shows the key differences between both the process improvement frameworks.”

4 Improvement Roadmap for Implementation

There are five levels of maturity in TMMi: starting from a level of being ad hoc and unmanaged, to improving in maturity to one which is managed, then defined, measured, and finally optimized. The process areas for each TMMi maturity level are shown below in figure 3.

• Level 1 - Initial: There are no defined process areas to be considered level 1. This means any organization regardless of whether they have any testing process can be considered at level 1. The actual maturity rating starts from level 2 upwards.

• Level 2 - Managed: This level has 5 process areas starting from Test policy and Strategy. The process here is considered stable and can repeat the tasks at the project level.

• Level 3 - Defined: Level 3 is standardization of processes at the organization level and also has 5 process areas.
- Level 4 – Measured: This level is quantitatively managed with focus on measurement, product quality and advanced peer reviews.
- Level 5 – Optimized: The organization is capable of continually improving its processes based on a quantitative understanding of statistically controlled processes. The testing techniques are optimized with continuous focus on fine tuning and process improvement.

5. Optimized
   Test Process Optimization    Quality Control

4. Measured
   Test Measurement            Product Quality Evaluation
   Advanced Peer Reviews

3. Defined
   Test Organization           Test Training Program
   Test Life Cycle and Integration Non-Functional Testing
   Peer Reviews

2. Managed
   Test Policy and Strategy    Test Planning
   Test Monitoring and Control Test Design and Execution
   Test Environment

1. Initial
   Testing is chaotic          Undefined process

Figure 3: TMMi Process areas

5 Assessment Approach

Assessment is the first step in benchmarking the progress in test process improvement with three main phases as shown in figure 4.

As part of the planning phase, we (refer my team as “we” since it may not be done by a single person) understand the scope of the assessment with focus on the business units, geographical locations, sample projects representing the organization getting assessed covering all lifecycle methodologies and project size.

Once the interviews are scheduled, we talk to the various stakeholders to understand the current landscape of the organization. We also perform documentary evidence reviews. The interviews are to ensure adequate coverage of the generic and specific goals and practices across various process areas of TMMi. Timelines change based on the maturity assessment level chosen by the organization to be assessed.
Based on the outcome of the findings report, recommendations are developed for every gap identified and they are prioritized based on the inputs from the organization. A detailed Implementation roadmap is finally developed with timelines for all the prioritized recommendations.


### 5.1 TMMi Assessment Maturity Rating Methodology

The rating process strictly adheres to what is laid out in TMMi Assessment Method Application Requirements (TAMAR) which defines the requirements considered essential to Assessment methods intended for use with the TMMi framework.

There are 16 process areas, 77 goals and 345 practices including the specific and generic practices from level 2 to level 5. The interviews and document evidence are rated for all the specific and generic practices which are rolled up to the goals, then to process area, and finally to the maturity level. See Figure 5 for an overview of the TMMI Rating Mechanism.
5.2 TMMi Maturity Level Calibration Guidelines

Process Areas are designated the appropriate maturity levels based on the following guidelines:

- **Fully Achieved** -
  - Convincing evidence of process compliance
  - Systematic and widespread implementation of process
  - No obvious weakness in distribution, application and results of this process exists
  - Process achievement is between 85% and up to 100%

- **Largely Achieved** –
  - Significant evidence of process compliance
  - Minor weakness in distribution, application and results of this process exists
  - Process achievement is between 50% and up to 85%

- **Partially Achieved** –

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* Ratings represented above are illustrative only.

Figure 5: TMMi Rating Mechanism
Some evidence of process found
- Process exhibits significant weaknesses, is incomplete, not widespread, or inconsistent in application or results.
- Process achievement is between 15% and up to 50%

**Not Achieved** -
- Little or no evidence of process
- Process achievement is between 0% and up to 15%

**Not Rated** - Any supporting goal that cannot be rated based on the current phase of the project must be “Not Rated”

**Not Applicable** - The process area is considered not to be in the scope of the assessment or applicable to the organizational unit by the Lead Assessor

### 5.3 Example

Let’s take the process area “Test Policy and Strategy” from level 2 as an example to clearly explain how the sub-practice contributes to the roll up of rating to the process area level. Sub-practice is an informative model component that provides guidance for interpreting and implementing a specific or generic practice. See Figure 6 which shows the complete flow.

Specific goals (SG) are a required model component that describes the unique characteristics that must be present to satisfy the process area. The 3 goals within the process area “Test Policy and Strategy” are:
- SG 1 Establish a Test Policy
- SG 2 Establish a Test Strategy
- SG 3 Establish Test Performance Indicators

Specific practice (SP) is an expected model component that is considered important in achieving the associated specific goal. The specific practices describe the activities expected to result in achievement of the specific goals of a process area.

The SG 1 which is “Establish a Test Policy” contains the following 3 specific practices:
- SP 1.1 Define test goals
- SP 1.2 Define test policy
- SP 1.3 Distribute the test policy to stakeholders

The SP 1.1 which is “Define test goals” contains the following sub-practices:
- Study business needs and objectives
- Provide feedback for clarifying business needs and objectives as necessary
- Define test goals traceable to business needs and objectives
- Review the test goals with stakeholders
- Revisit and revise the test goals as appropriate, e.g., on a yearly basis

Once all the above sub-practices are satisfied, the SP 1.1 will be fully implemented and likewise once SP 1.1 to SP 1.3 is satisfied, SG 1 will be fully implemented. Then the roll-up happens to the process area “Test Policy and Strategy” when all the SG 1 to 3 are evidenced.
6 Benefits and Projected Savings

The improvements indicated below in Figure 7 are determined based on a number of factors from some sample projects and also could vary for different organizations.

TMMi completely focuses on addressing Testing practices and enables not only enhancement in quality through excellence in Testing process once these recommendations are implemented, but most importantly provides tangible business benefits to the organization given the fact testing phase of project accounts for nearly 40 to 50 percent of project efforts and related cost.
7 Summary

There has been a lot of traction in the recent years with so many organizations attempting to achieve TMMi maturity at various levels. Organizations want to decrease the leakage of defects to production, reduce the testing rework, provide quality outcomes and reduce cost of testing by having standardized TMMi practices, thus improving overall customer satisfaction. This paper explains how organization that starts out as ad hoc can identify their weaknesses and remediates the gaps to transform to higher maturity levels using the only recognized Test maturity model available in the industry and benchmark their test practices.
8 References

https://www.astqb.org/certified-tester-resources/astqb-software-testing-conference/conference-agenda/how-to-take-organizations-to-higher-testing-maturity/

TMMi Foundation Reference Model
http://www.tmmi.org/pdf/TMMi_Framework.pdf

“Dell Enterprise Validation First in North America to achieve TMMi Certification”