

## **How does TMMi work and what does it contain?**

June 2013

### **Scope**

Poor quality is expensive and trying to test quality back into a damaged product is a losing game. The TMMi seeks to help organizations to improve the whole testing process through a holistic approach to quality assurance. The TMMi approaches improving testing by providing a standard reference model so that strengths and best practices can be identified and weaknesses in testing effectiveness and efficiency can be improved. This paper seeks to clarify how the TMMi works and what it contains.

### **Why a Testing Reference Model?**

Application Development and Maintenance (ADM) quality is a significant concern for all organizations because it affects their ability to deliver value and customer satisfaction. To discuss and ultimately improve “quality”, we have to have a common definition but there are numerous competing definitions. For example, the definition of quality varies from the precise (Crosby – “Conformance to requirements”) to the meta-physical (Juran – “Quality is an attitude or state of mind”). The “Testing Maturity Model Integration” (TMMi) addresses this challenge by providing a tangible definition of testing quality against which an organization can measure itself.

### **What value does TMMi provide?**

The TMMi is a model of testing best practices and testing processes represent is an important set of tools for improving the quality of the delivered software product. Increased testing maturity can improve an organizations bottom line by improving customer satisfaction, increasing development productivity, speeding delivery rates and reducing costs but only in the context of an holistic quality assurance approach. The Testing Maturity Model Integration (TMMi) is a model of testing best practices that can help organizations determine whether their testing processes are complete and whether they are effective.

### **What is the TMMi?**

The TMMi is an independent test maturity reference model. As a reference model it contains a high level quality assurance framework consisting of interlinked concepts. This framework can be used as a communication vehicle for ideas and concepts inside an organization that adopts the model and among the members of the broader testing community. As a reference model of testing best practices the TMMi facilitates process improvement, assessment and conversation.

The Model is maintained by the TMMi Foundation ([www.tmmi.org](http://www.tmmi.org)) based in Dublin, Ireland. The TMMi Foundation delivers assessment and training services and provides accreditation of service providers, trainers, assessors and training materials. To

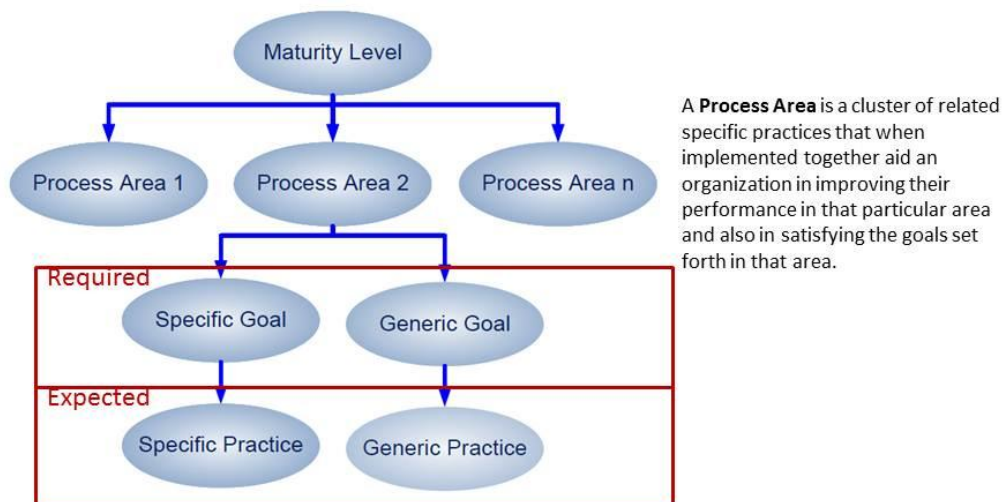
facilitate a conversation about testing and the model and to generate a TMMi community, the Foundation provides a public forum for interested parties to facilitate the free interchange of information, education, ideas and usage of the public standard

## Where Did the TMMi Come From?

The TMMi concept was first published in a two part article in Crosstalk in 1996. The Model, originally the TMM, was heavily influenced by the tone and structure of the CMM. The TMM, and now the TMMi, is a staged model with five steps (one = initial and five = optimization). The TMMi and the CMMi share a common structure providing alignment and a mechanism for common discussion. The model is compliant with Software Process Improvement and Capability Determination (SPICE) ISO 15504 standard for process assessment.

## The Model

A **Maturity Level** within TMMi indicates the degree of organizational test process quality. There are 5 levels of maturity. Each level identifies the process areas which must be implemented to achieve that level and therefore which goals that are required to be met. It is important to remember that maturity levels are not independent. Each level builds upon the lower levels and relies on those lower levels to provide the foundation for solid growth.



The structure of the TMMi model follows the structure of the Capability Maturity Model Integrated (CMMI). The CMMI has become a fixture in many organizations and is broadly understood in the ADM community so the similar structure of TMMi provides benefit because it eliminates the need to learn the structure of the model while learning the specifics of TMMi.

For those less familiar with structure of the CMMI, the TMMi contains three element types: Expected, Required, or Informative.

## **Expected Elements of the TMMi: Specific and Generic Practices**

The TMMi contains both specific and generic practices as the lowest element of the model. Specific practices identify activities related to a particular process area which are expected to be performed to satisfy a Specific Goal. The Generic Practices are similar in that they are expected to be performed to satisfy a Generic Goal. Where the Specific Practices and Generic Practices differ is that while the specific practices have a one-to-one relationship with a particular process area, the generic practices have a one-to-many relationship in that they relate to ALL process areas.

## **Required elements of the TMMi: Specific and Generic Goals**

The implementation of the Specific and Generic Practices should be done with the intent of providing value to the organization and improving quality of testing and not to check a box. The intent of the expected practices is to be sure that the improvement goals are being met and to satisfy the required elements of the model; the specific and generic goals.

A Specific goal is unique to the process area in which it is contained. The Generic Goals span multiple process areas and are required to show “institutionalization” of the organization’s processes. Institutionalization of process means that the defined procedural steps truly indicate the way an organization does business and are not simply listed as activities with the sole purpose of checking a TMMi box. For example, one Process Area in TMMi is “Test Environment” which includes the following specific goal and associated specific practices:

SG 1 Develop Test Environment Requirements

SP 1.1 Elicit test environment needs

SP 1.2 Develop the test environment requirement

SP 1.3 Analyze the test environment requirements

## **Informative elements of the TMMi: Purpose, Introductory Notes, Examples, and Sub-Practices**

The TMMi model provides additional information to support the required goals within the model. Each process area contains a purpose statement to explain the intent of that particular process area and introductory notes to describe the major concepts which will be covered in that process area. The purpose and introductory notes should be read prior to reading the practices and goals as they are an excellent resource for understanding the concepts and intents, not just the words.

TMMi identifies examples of outputs typically seen at organizations that have implemented the model. It is important to understand that the list of example work products is not a list of required outputs and does not contain a complete list of possible outputs. The intent of the example work products is to identify commonly created outputs which will assist the reader in developing an understanding of what the practice expects to find and to understand the content of that output. A sub-practice provides a detailed description on the implementation and interpretation of the practice.

## Maternity Levels

The Five Levels in the Testing Maturity Model	
Level	Description
Level 1 – Initial	At this level an organization is using ad-hoc methods for testing, so results are not repeatable and there is no quality standard.
Level 2 – Definition	At this level testing a defined process exist, so there might be test strategies, test plans, test cases, based on requirements. Testing does not start until products are completed, so the aim of testing is to compare products against requirements.
Level 3 – Integration	At this level testing is integrated into a software life cycle, e.g. the <a href="#">V-model</a> . The need for testing is based on risk management, and the testing is carried out with some independence from the development area.
Level 4 – Management and measurement	At this level testing activities take place at all stages of the life cycle, including reviews of requirements and designs. Quality criteria are agreed for all products of an organization (internal and external).
Level 5 – Optimization	At this level the testing process itself is tested and improved at each iteration. This is typically achieved with tool support, and also introduces aims such as defect prevention through the life cycle, rather than defect detection (zero defects).

## Conclusion

Application Development and Maintenance processes generate quality problems. Whether through coding errors, missed requirements or misunderstood requirements, defects are buried in the project deliverables. The problem is that finding those defects is expensive. Defects are expensive to find, expensive to remove and expensive for those that use the software. Consequently, while efforts to improve defect introduction are important, it is equally important to implement effective, efficient and economical testing to assure quality. The TMMi is a reference model for testing supported by the

TMMI Foundation which is specifically designed to address testing and to help organizations improve the maturity of their testing practices.

## Sources

1. [www.tmmi.org](http://www.tmmi.org)
2. Crosstalk August and September 1996 "Developing a Testing Maturity Model: Parts I and II", Ilene Burnstein, Taratip Suwannasart, and C.R. Carlson, Illinois Institute of Technology
3. [http://en.wikipedia.org/wiki/Testing\\_Maturity\\_Model](http://en.wikipedia.org/wiki/Testing_Maturity_Model)