Adopting the Right Software Test Maturity Assessment Model

To deliver world-class quality outcomes relevant to their business objectives, IT organizations need to choose wisely between industry standard and advisory testing assessment approaches.

Executive Summary

Over the past few years, we have conducted a steady stream of enterprise conversations regarding test maturity assessments. The key driver: IT executives realize the growing criticality of software testing within the overall software development ecosystem. Software development complexity has grown manifold times, compounded by an expansion in the scope, size and coverage of technology. This has, in turn, led to an increasing complexity in the testing lifecycle. The process of applications testing is continuously evolving (at its core) to align with changes in the technology landscape.

Moreover, IT organizations are under constant pressure to control costs and justify their investments. Therefore, it is imperative to have predictable processes, deploy skilled resources and leverage productivity tools while improving quality, reducing costs and accelerating time-to-market. More often than not, enterprises are unable to balance the two sides of the equation, due to the constant struggle of marrying both objectives. One way of getting around this is to have an independent body assess IT process maturity. The outcome of such maturity assessments has played a vital role in shaping the objectives of test organizations. Findings from such assessments have helped test organizations evolve from merely focusing on defect identification within the engineering lifecycle to offering a set of value-enabling processes to advance the development ecosystem.

However, with multiple assessment models made available today, including industry- and service provider-specific models, organizations are challenged to identify the assessment model pertinent to their needs. This white paper demystifies the various available assessment models and presents guidelines to choose the best-fit model, one relevant to a given business.

Choosing a Test Maturity Assessment Model

Industry gurus have forever debated the virtues and vices of standard and advisory models. The discussion typically pivots around whether to use a globally recognized industry-standard model or a proprietary (or assessment) model for multiple global and multinational enterprises.

The typical objective of any test maturity assessment is to identify the areas of inefficiency to reduce costs, increase quality and improve time-to-market. Since the late 1970s, when testing
became an independent profession, various organizations such as ANSI, ISO, IEEE, SEI and the TMMi Foundation have published frameworks and standards with the aim of standardizing and streamlining application testing practices. Along with the best practice models, these industry bodies also developed frameworks to certify and benchmark the level of maturity regarding the adoption and implementation of certain industry best practices. Among these, TMMi is the only organization that has adopted a framework-based approach; others provide prescriptive guidelines. For the purpose of easy reference, this paper will use TMMi as the industry standard assessment model.

Over time, various service organizations have extracted what they have believed to be the best practices from guidelines and frameworks such as those proposed by ISO, IEEE, SEI and TMMi to develop their own variants. Service organizations have applied their years of experience to further develop and refine their frameworks. As a result, multiple models exist that enable test organizations to assess their current state efficiencies and effectiveness, understand the gaps and define a transformational roadmap, all while benchmarking the test organization against its peers. In this paper, such models are referred to as advisory assessment models.

Test Assessment Models and Their Coverage

All organizations have their test delivery processes that run at some level of maturity, including those perceived to be at lower levels. Relative to testing, organizations with low levels of maturity are likely to have informal and undocumented processes. When these testing teams interact with other teams working on upstream and downstream activities, there is a chance of methodological conflict. This increases the cost of quality and injects inefficiency into the delivery ecosystem. These problems compound if the organization scales up and has multiple test delivery teams.

A test maturity assessment typically supports by performing the following tasks:

- **Analyze the current state** of processes.
- **Develop the target state**, based on assessment objectives, typically aligned to an industry ideal or an internal/external benchmark.

- **Develop a set of recommendations** on ways to achieve the target state.

Broadly, the frameworks cover the following aspects. Each of these four areas can be split into multiple focus areas or aggregated into two or three focus areas based on the assessment context:

- **Organization and operating model**: Focuses on the structure of the test organization and operating model.
- **Test lifecycle**: Focuses on test delivery processes such as estimation, management, defect prevention, functional testing, regression and UAT.
- **Support functions and PMO**: Focuses on touch points within the software delivery lifecycle (SDLC), such as change, configuration, build and release management, and on other support functions such as knowledge and project risk management.
- **Tools and infrastructure**: Focuses on test management and execution tools including execution environment and nonfunctional testing.

Assessment Models and Comparison

**TMMi: The Industry Standard Assessment Model**

TMMi is best suited to enterprises with a full-fledged IT organization and large volumes of in-house software development and testing. To be TMMi certified, organizations must spend extensive time preparing for audits. Before an external audit can be scheduled, they must be able to demonstrate processes implemented and executed at the planned TMMi level for at least two full software releases or delivery cycles. The certification process is likely to be viewed as system overhead and potentially occupy a significant portion of the IT budget along with staff effort, taking away from the core business activities. Additionally, there are very few certified lead TMMi assessors, which could potentially lead to high audit costs.

Furthermore, TMMi is a staged model, in which all process areas at every stage need to conform to the defined stage criteria. It requires compliance with all process areas (or acceptable alternatives) of lower stages before the next stage capability.
can be assessed. As a result, in many IT organizations TMMi compliance can be restrictive.

Though this might seem discouraging at first glance, a TMMi assessment has distinct advantages. It was built using extensive industry data and provides an excellent process library and a standard book of knowledge. The TMMi assessment provides a formal benchmark of an organization’s test process maturity against a globally accepted model. A TMMi rating increases the visibility and acceptance of the test group and its practices. For organizations that have in-house development and testing, TMMi certification is useful in reassuring their end businesses that they are following industry standard best practices and processes. Additionally, it streamlines the process of IT integration with third-party vendors as the guidelines and processes (standard book of knowledge) that need to be adhered to by the vendors are an industry standard.

Advisory Assessment Models
Advisory models are best suited to organizations on the lookout for flexibility in assessing and mapping their quality journeys. They could be a part of small-scale organizations or multinational companies with varying degrees of in-house software development and testing. The biggest advantage with these models is they are based on the company’s operating model, thereby helping it organize in a way that enables an efficient test function. Focus areas of these frameworks can also vary based on the organization’s objectives and scope. Most advisory models are continuous models, thereby enabling organizations to build capability in specific process areas that are of primary importance.

Furthermore, most advisory models assess not only compliance with the model, but also the effectiveness of compliance. For instance, our best in class (BIC) testing framework maps the metrics to each of its maturity levels. (For more information on BIC, please read our white paper “Software Quality Transformation.”) The best-in-class model provides a quantitative measure to link the maturity of testing process areas to business outcomes. Organizations benefit from these types of assessments since they leverage the assessor’s delivery experience to ensure efficient and effective delivery.

However, it must be noted that the models in question are vendor-specific. The models create a dependency on one vendor such that if a vendor has conducted an assessment another vendor will not implement the recommendations. This is primarily because there is a level of subjectivity in the recommendations and roadmaps that breeds vendor bias. Therefore, organizations need to be sure about their trusted vendor before starting on a quality journey using advisory assessment models.

Quick Take
Gaming the Test Assessment Process

During the implementation of our BIC test assessment framework for a gaming company, the client’s focus was on early defect identification to contain more than 90% of defects to the unit testing phase. We treated the process area of unit testing not as a touch point to testing but as a core test delivery process. As a result, the implemented framework was more relevant and effective compared with a stock standard process implementation. Along similar lines, we introduced a focus on support functions and touch points, tool evaluation, automation and relevant solution accelerators to ensure an outcome relevant to the client’s objective of early defect containment.

To summarize, our recommendations were centered on transforming the testing team into a quality engineering team for exhaustive testing of Java APIs using white box techniques as well as testing the end-to-end product for business readiness.
Looking Ahead

The myth of process implementation is that it caters to the lowest common denominator. In reality, an effective maturity assessment custom builds an implementation roadmap and reduces waste. Enterprises should consider the following key questions to gauge their current state and understand what they need from a test assessment perspective so that they can perform better:

• What are the business drivers and objectives?
• What is the kind of application being tested?
• Is IT consolidated or distributed?

By tackling these questions, the decision on a suitable assessment model is driven by both strategic and operational considerations. However, it is imperative that the recommendations are aligned to long-term goals and molded around the core operating model. Doing so enables organizations to be assessed either by a vendor-specific model or an industry standard model.

Conversely, for enterprises that want an assessment for strategic purposes, answers to the following questions will come in handy:

• What is the purpose and the expected outcome of the test maturity assessment?
• What is the relevance of the organization’s IT products in the market, versus its competitor’s?
• What is the long-term plan for the testing services?

A strategic assessment can be leveraged as a marketing tool for an enterprise’s internal testing services, or to build confidence among its business users. Unless the company has worked with a specific vendor, or intends to transition testing to a specific vendor, an industry standard model has definitive selling value.

In conclusion, there is no single-fit right model. An informed decision by IT stakeholders, in discussion with the vendor, is the only way for organizations to challenge the status quo.

About the Authors

Shanmuga Karthikeyan is a Director within Cognizant’s Process and Quality Consulting Practice. Karthik has over 19 years of experience in IT business development and delivery management with a core knowledge of quality assurance (QA) in the banking and financial services and insurance domains. He consults with Fortune 500 companies on transforming their QA functions into world-class quality organizations and has assessed, designed, implemented and managed testing centers of excellence for multiple large financial services organizations. Karthik can be reached at Shanmuga.Karthikeyan@cognizant.com.

Srikanth Rao is an Associate Director within Cognizant’s Process and Quality Consulting Practice in the Asia Pacific region. He has over 14 years of experience in the areas of banking, technology and process, and quality engineering and assurance. Srikanth consults with companies on enterprise-wide process implementation, change management, training and appraisals, with the help of industry-best models, standards and frameworks. He has also worked in Europe with a large financial services organization on its multicountry core banking implementation program. Srikanth can be reached at Srikanth.Rao2@cognizant.com.
About Cognizant

Cognizant (NASDAQ: CTSH) is a leading provider of information technology, consulting, and business process outsourcing services, dedicated to helping the world’s leading companies build stronger businesses. Headquartered in Teaneck, New Jersey (U.S.), Cognizant combines a passion for client satisfaction, technology innovation, deep industry and business process expertise, and a global, collaborative workforce that embodies the future of work. With over 75 development and delivery centers worldwide and approximately 178,600 employees as of March 31, 2014, Cognizant is a member of the NASDAQ-100, the S&P 500, the Forbes Global 2000, and the Fortune 500 and is ranked among the top performing and fastest growing companies in the world. Visit us online at www.cognizant.com or follow us on Twitter: Cognizant.

© Copyright 2014, Cognizant. All rights reserved. No part of this document may be reproduced, stored in a retrieval system, transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the express written permission from Cognizant. The information contained herein is subject to change without notice. All other trademarks mentioned herein are the property of their respective owners.