Article can be accessed online at http://www.publishingindia.com

Decoding DA-Vinci Code: TMMI Assessment Model Revisited

Shankar Ramamoorthy

Quality Business Partner, Amdocs DVCI Pvt Ltd, Cyber City Tower 2, Magarpatta city Pune, Maharashtra, India. Email:Shankar.Ramamoorthy@amdocs.com

Abstract

The majority of IT organizations face considerable challenges in tailoring their test process frameworks, since not every process applies to all types of testing projects in any one test organization. Regardless of whether an organization's testing process is CMM[1] compliant, CMMI[2] compliant, ISO 9001: 2008 Quality Management System compliant, or just internally compliant, a single process framework of an organization cannot be applicable for all types of project. After all, some projects are straightforward and have relatively short gestation periods, while others are huge transformation projects that include a high level of uncertainty and painstaking complexity.

Within this landscape where project composition, type, and nature are varied and diverse there is a need to define the context of each project. As test process leaders, Test Managers need to drive the definition of project context and implement processes that can be signed off as early as project kick-off and implemented diligently.

Keywords: Complexity, Uncertainty, TAM (Test Assessment Model) Testing, Multi Criteria Decision Making, Sheep Dogs, Cows, Bulls, Colt, TMMI

1. Introduction

In the TMMI Assessment Model, project complexity and uncertainty is the key problem to which the appropriate usage of processes can help provide a solution. Various dimensions and perspectives have been created to understand this.

This paper proposes a context-driven testing approach for ANY ORGANIZATION Testing projects. ANY ORGANIZATION Testing projects are profiled under four categories based on the testing types, and each of the project types is plotted under four quadrants based on project complexity and uncertainty. The model is based on the premise that the value of any practice depends on its context. This school of testing purports that there are good practices in context but there are no best practices. People working together are the most important part of such a project's context. Technically, this school maintains that the product is a solution and if the problem isn't solved, the product does not work. Each of the testing models does not address the project challenges faced. The essence of the proposed TMMI Assessment Model is to do the best we can with what we get. Context actually means we improve effectiveness and reliability through situational specific strategies, processes and practices. This model proposes to manage uncertainty (market, technical, customers, duration, and change) and complexity (team size, team location, maturity, domain gaps, and dependencies). Context-driven testers start with requirements of stakeholders and are keen to understand projects' complexity, uncertainty, and constraints and are not context oblivious. Context-oblivious testers do not match the testing practices with testing problems. They do exploratory testing . Context-imperial testers[3] (that is to say, testers who consider context as king) insist on changing the project or business in order to fit the testers' own best practice or models. The context-driven testing school described in this paper is an approach and not a technique. The TMMI Assessment Model proposes and maps testing types of ANY ORGANIZATION Testing into four quadrants. The four quadrants are mapped based on project complexity and uncertainty.

[1] Weber
[2] S Shrum
[2] J Bach

Uncertainty		Complexity	
Attribute	Score	Attribute	Score
Market		Team Size	
Technical		Mission Critical	
# Customers		Team Location	
Duration		Team Maturity	
Change		Domain Gaps	
		Dependencies	
Opportunities to Reduce Uncertainty: ▪ Use proven technologies ▪ Reduce project duration		Opportunities to Reduce Complexity: ▪ Collocate the team ▪ Break project into sub-projects	

Fig. 1. Uncertainty and Complexity Factors and Example of Scoring

A. Sheep Dogs

Relatively mature products of ANY ORGANIZATION should be tested in this quadrant where developers and testers are domain experts in ANY ORGANIZATION products. Project complexity and uncertainty are low, iterations are fewer, teams are collocated, and TAM Testing for Sheep Dogs entails clean and clear regression suite (automated). TMMI Assessment proposes test strategies for offloading and outsourcing. The guidance of the TMMI Assessment model is to perform multi-level regression testing and automated smoke testing of all key processes in the Software Testing Lifecycle and all major process areas of ANY ORGANIZATION standard methodology and tools.

B. Colts

This quadrant signifies new product releases, weekly iterations, collocated teams, and very active product owners and projects of this type have high uncertainty and low project complexity. ANY ORGANIZATION B2B and Agile projects fall under this quadrant. TMMI Assessment proposes Ad-hoc testing, lightweight processes, and the creation of change components. The guidance of the TMMI Assessment model for these projects relates to discovering the context and inventing the processes to perform TAM Testing. ANY ORGANIZATION e-Business Digital Experience projects belong to this category and not all process areas of ANY ORGANIZATION Testing can be followed here. Agile projects with Test First Approach and Test Driven Development (TDD) will be applicable for this quadrant.

C. Bulls

This quadrant signifies complete releases (E2E) with paired project management and frequent integration. ANY ORGANIZATION E2E projects are examples of this quadrant. The TMMI Assessment model proposes to use tight cohesion as project uncertainty and project complexity are very high. This model proposes a high degree of process management for these types of projects with adequate gates, reviews and control.

D. Cows

This quadrant signifies high project complexity and low uncertainty. Testing where backend changes and a high level of interface management has to be done can be mapped to this quadrant. ANY ORGANIZATION Transformation projects fit into this category. The customers are dominant here and teams are distributed with a high amount of interface management and inter-project management. The TMMI Assessment model proposes frequent checkpoints for such projects.

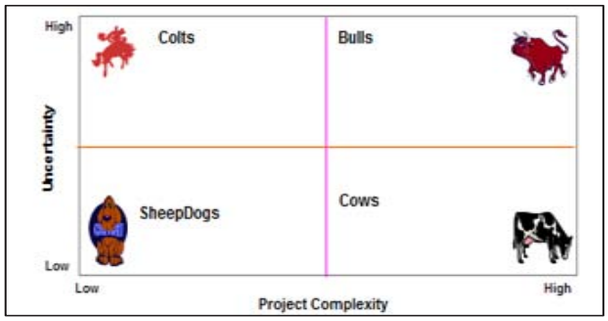

Fig. 2. Complexity – Uncertainty Grid

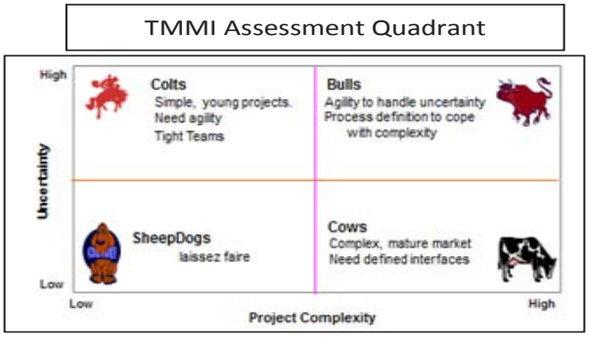

Fig. 3. Quadrant of Uncertainty –Complexity Grid

An attempt has been made as part of this research paper to explore different kinds of companies and projects and tailor

and customize TMMI based on ANY ORGANIZATION process framework for TAM (TMMI Assessment Model). The 16 process areas of TMMI have been tailored and classified into each of the project quadrants as below.

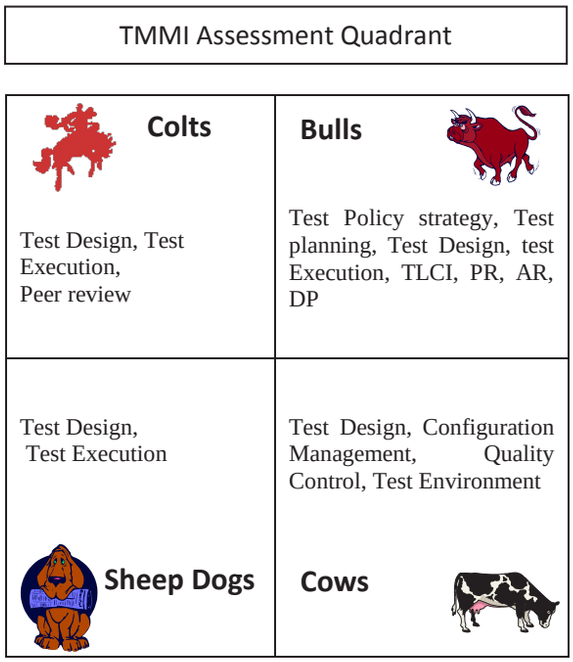

Fig. 4. TMMI mapping of Context Leadership Model

2. Process Tailoring Using TMMI Assessment Model

This model includes:

2.1 Colt

Due to less complexity and high uncertainty, studies say that the uncertainty is manageable. Hence the focus is on Test Planning to define and / or redefine execution path. Peer Review is also considered to manage uncertainty. Defect Prediction is also considered to provide guidelines on expected defects. Test Monitoring and Control, Test Design and Execution are also considered for Colt-based projects. Here the focus is on MVQ (Minimum Viable Quality) rather than the possible quality or testing that can be done, since time constraints mar the usage of heavy processes here.

2.2 Bulls

This relates to projects of both high complexity and high uncertainty. To manage such projects Test Policy and Strategy is needed more for the purpose of setting stakeholders' expectations. Test Planning, is also considered to manage both uncertainty and complexity. TDE (Test Design and Execution) and TMC (Test Monitoring & Control) are used to manage the project execution.

Peer Review and Advanced Peer Review are used as additional tools to manage uncertainty. Defect Prediction is also used to provide guidelines on expected defects

Test Environment is used to manage environments for test execution, Test Organization helps define the roles at different levels, and Test Lifecycle and Integration help manage the complexity of projects.

2.3 Sheep Dogs

These types of projects will have all key processes like TPS(Test Policy Strategy), TMC(Test Monitoring and Control), Defect Prevention, and Peer Reviews. A high degree of process optimization can be done for Sheep Dog type projects where mature products and rolling releases of ANY ORGANIZATION are tested.

2.4 Cows

These types of projects are applicable for transformation type projects in ANY ORGANIZATION that require huge interface management and are too complex but certainty is low. One can apply TPS, TMC, TLI (Test Lifecycle Integration), PR(Peer Review) and DP(Defect Prevention) for these types of projects.

3. Usage of TMMI Assessment Model For Any Organization Testing Projects

Each of the testing projects in ANY ORGANIZATION Testing will be classified into one of the four quadrants using the criteria of Project Complexity and Project Uncertainty. The entire project list (Group View) will be plotted into each of the four quadrants. Process sets will be created for Sheep Dogs, Colts, Bulls and Cows. During Kick Off, all the factors of the project - namely market, technical prowess, customer base, duration of project, change management, team size, criticality, team location, team maturity (experience/learning curve), domain gaps, and third-party dependencies - will be listed as variables.

TAM (TMMI Assessment Model) strategies will be applied to each of the project types. Each project type, based on the quadrant it belongs to, will have its own testing objective, which will alleviate uncertainty and reduce project complexity.

Processes listed for each of the quadrants will be followed right from Kick Off.

4. Validation of TMMI Assessment Model

At the project Exit meeting, the usage of processes and their benefits will be assessed and a project quality score will be computed to take into account the uncertainty and complexity factors using variables and their weightages. This model will be suited to organizations like ANY ORGANIZATION and other organizations that have their own internal process frameworks. It provides guidance to process practitioners to pick and choose the right quadrant based on their project category. Agile projects at ANY ORGANIZATION Testing can use the processes listed for the Colt quadrant. Similarly, other types of project like E2E, Transformation, B2B or S2S, or any nine functional streams of ANY ORGANIZATION Testing can use this model.

5. Conclusion

There is no need to kill a fly with a sledgehammer. The idea behind this paper is to bring about a customized and tailored view that is more relevant to the individual context of a project before we begin testing. TAM Testing and leadership models are becoming popular in organizations who have developed not only lightweight processes but also have used the concepts of project complexity and uncertainty as major drivers to determine the best process set that can be adopted and adapted for a specific context.

This paper highlights the need for bringing about a calibrated approach as we see in the four quadrants of the model. There is no such thing as a single best practice; practices that work for the organization and which are in alignment with their business goals will prove to be the best fit process set for companies to leverage in the coming years.

Acknowledgment

II acknowledge the vast experience of all the stakeholders whom I have worked with in helping me to arrive at this model. The model is the result of my sincere and honest conversations with people who I have worked with and who have indicated a strong opinion on how they feel about processes that are heavy, complex, and serve no purpose other than satisfying the auditor and his narrow compliance criteria.

References

Bach, J. (2004). E*xploratory testing, in: E. van Veenendaal, The testing practitioner* (2nd Ed.). UTN Publishing.

Paulk, M., Weber, C., Curtis, B., & Chrissis, M. B. (1995). *The capability maturity model, guidelines for improving the software process*, Addison –Wesley.

Chrissis, M. B., Konrad, M., & Shrum, S. (2007). *CMMI Second edition, Guidelines for process integration and product improvement*, Addison Wesley.

[ISO9001:2008] Quality Management Systems-Fundamentals and Vocabulary, International Organization for Standardization.

CDTL(Context Driven Test Leadership Model) - Dr. Shankar Ramamoorthy, International Conference on Emerging Trends in Software Testing UNICOM 2014.

Ramamoorthy, S. (2015). Agile Test Leadership Model – International Conference QAI –STCQAI.

Brief Bio of Author/s

Dr. Shankar Ramamoorthy is currently working as Quality Business Partner in Amdocs Testing services. Dr Shankar is a TQM (Total Quality Management) professional, who has spent much of his 25-years career managing change and improving software Quality Engineering efficiency through Data and Metrics driven Quality Management Systems. He believes in evangelizing, coaching and mentoring test teams through inspirational leadership. Shankar is a computer science engineer from NIT Tiruchirappalli and is armed with a PhD in Software Quality Engineering from IIT Delhi, M. Tech from IIT-Delhi in Technology Management Systems, and an MBA from AIMA-Delhi.