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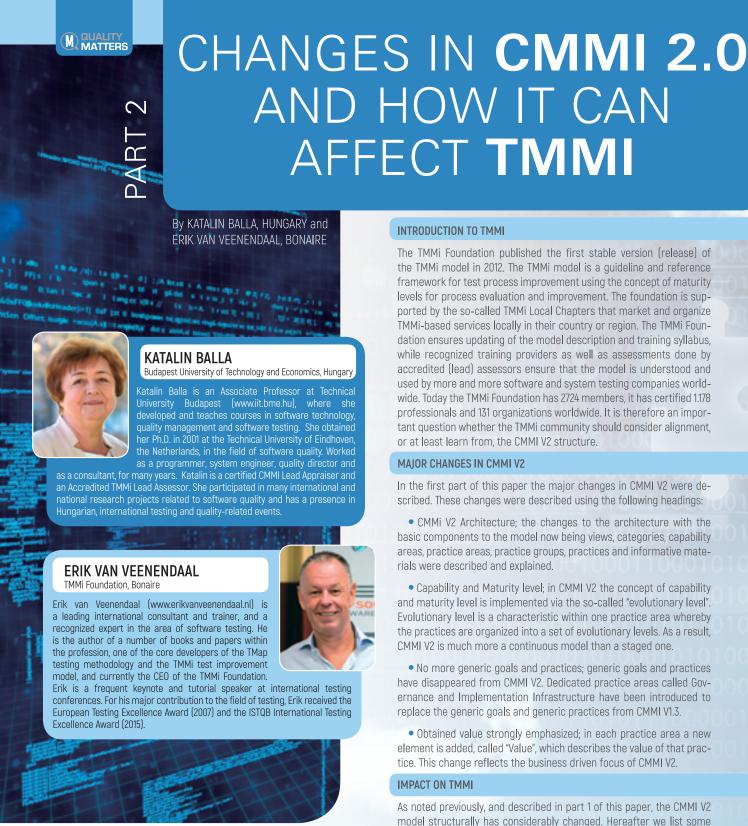by WIM DEMEY

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CHANGES IN **CMMI 2.0** AND HOW IT CAN AFFECT **TMMI**

By KATALIN BALLA, HUNGARY and
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This paper is intended to guide quality and testing professionals in becoming acquainted and understanding the changes made to the CMMI model, now called CMMI V2. In part 1 of this paper both the structural and process area related changes were discussed, including their business value. Within the TMMi community many organizations also use CMMI. The changes made to the CMMI could well affect future developments around TMMi. The possible impact on TMMi is described in this part 2 of the paper. Finally, this paper is intended to support those TMMi practitioners who use TMMi in the organizational context of CMMI V2.

INTRODUCTION TO TMMI

The TMMi Foundation published the first stable version (release) of the TMMi model in 2012. The TMMi model is a guideline and reference framework for test process improvement using the concept of maturity levels for process evaluation and improvement. The foundation is supported by the so-called TMMi Local Chapters that market and organize TMMi-based services locally in their country or region. The TMMi Foundation ensures updating of the model description and training syllabus, while recognized training providers as well as assessments done by accredited (lead) assessors ensure that the model is understood and used by more and more software and system testing companies worldwide. Today the TMMi Foundation has 2724 members, it has certified 1.178 professionals and 131 organizations worldwide. It is therefore an important question whether the TMMi community should consider alignment, or at least learn from, the CMMI V2 structure.

MAJOR CHANGES IN CMMI V2

In the first part of this paper the major changes in CMMI V2 were described. These changes were described using the following headings:

- CMMi V2 Architecture; the changes to the architecture with the basic components to the model now being views, categories, capability areas, practice areas, practice groups, practices and informative materials were described and explained.

- Capability and Maturity level; in CMMI V2 the concept of capability and maturity level is implemented via the so-called "evolutionary level". Evolutionary level is a characteristic within one practice area whereby the practices are organized into a set of evolutionary levels. As a result, CMMI V2 is much more a continuous model than a staged one.

- No more generic goals and practices; generic goals and practices have disappeared from CMMI V2. Dedicated practice areas called Governance and Implementation Infrastructure have been introduced to replace the generic goals and generic practices from CMMI V1.3.

- Obtained value strongly emphasized; in each practice area a new element is added, called "Value", which describes the value of that practice. This change reflects the business driven focus of CMMI V2.

IMPACT ON TMMI

As noted previously, and described in part 1 of this paper, the CMMI V2 model structurally has considerably changed. Hereafter we list some recommendations regarding the changes that could be or should be studied in detail at a later stage in the context of future developments around TMMi. One potential benefit of unifying (or, at least, bringing closer) CMMI V2 and TMMi structures is to make possible assessing the two models together. Also, an organization using both CMMI and TMMi would save effort in implementation and institutionalization of the models if they would have a similar or related structure.

- Removing the generic goals and practices and replacing them with specific process areas (practice areas) dedicated to institutionalization, e.g., Governance and Implementation Infrastructure like CMMI V2 is something that would probably bring the same benefits to the TMMi as with CMMI.

- Changing from process areas to practice areas in this Agile era where the term "process" is less popular, and thereby emphasizing that TMMi is a collection of best (or good) practices rather than a collection of processes to be implemented, is something worth considering.

- An additional focus on value and business objectives is always something that should be considered. Although TMMi already has defining goals and objectives at TMMi level 2, this aspect can almost never have enough attention.

- Not mentioned before but Estimation is now a separate practice area. This change emphasizes the importance of this area in evolving realistic project and work plans. This is something that could also be considered to TMMi.

- The change to the way maturity levels are now defined is a move from staged to continuous. Clearly both types of approaches have their strengths and weaknesses. TMMi is currently a staged model and moving to a more continuous model would have an enormous impact. Not only on the model itself but also in the way TMMi assessments and certification is performed. Finally, TMMi is freely available (in contrast to CMMI) which the authors consider a huge benefit of the TMMi.

TESTING RELATED PRACTICE AREAS

Of course testing-related practices have remained in the new version of the CMMI. They have been partly restructured, and completed. These practices appear in the practice areas of Peer Review and Verification & Validation of the capability area ensuring quality, as well as within the practice area Product Integration of the capability area engineering and developing projects.

Peer Reviews has again a separate practice area (while in CMMI V1.3 it was included within a specific goal in the Verification process area). Following the evolutionary architectural characteristic Peer Review practices are now present from level 1 through level 3. There is no special indication on the type of work products that should be peer reviewed on level 1. Preparation and performing Peer Reviews is a level 2 requirement, while analyzing data from peer reviews stays now on level 3 (where the entire process of Peer Reviewing was required in CMMI V1.3). Note that in TMMi Peer Reviews there already is a separate process area (see figure 5).

Figure 5: TMMi model and process areas

Looking at the Verification and Validation practice area, which is a combination of the separate CMMI V1.3 process area Verification and Validation, it now has practices from level 1 to level 3. The practices at level 1 include "Perform verification / validation to ensure the requirements are implemented and record and communicate results" and "Perform validation to ensure the solution will function as intended in its target environment and record and communicate results". Practices have been added at level 2, and refer to development, keeping updated, and following procedures for verification and validation. Existing requirements (from CMMI V1.3) related to selection of the components to be verified / validated are now required at level 2. Using criteria for verification and validation is at level 3, while analysis and communication of results is also a level 3 practice. As a general conclusion, the various practices in CMMI 2.0 are still on a very high level when it comes to testing.

Finally, let us analyze the Product Integration. This practice area has some new requirements compared in it: "Confirm, prior to assembly, that component interfaces or connections comply with interface or connection descriptions" and "Evaluate integrated components for interface or connection compatibility".

THE NEED FOR TMMI

Summarizing the previous information, we can state that testing-related processes and practices have in CMMI V2 a slightly different distribution over the capability and maturity levels than they had in CMMI V1.3. Basically, the performance of the testing-related practices is encouraged from the very beginning of a process improvement, requirements being present already at Level 1. This is a positive change.

However, detailed requirements or implementation guidelines with respect to testing are not provided in CMMI V2. Elements related to testing strategy, testing policy, test environment, test organization, testing techniques, non-functional testing are still missing, and elements connected to test analysis, design and execution are not made explicit in the model.

Although this analysis was not complete, TMMi requirements connected to test processes are clearly much more detailed that CMMI V2 requirements. While it is of high importance that CMMI V2 emphasizes the need for execution of testing-related practices already at Level 1, and structures the testing practices to evolve over subsequent levels, further, more detailed requirements and guidance is needed in organizations engaged in professional testing. Therefore, the need remains to use CMMI V2 and TMMi in a synergic way.

At the same time, in CMMI V2 testing-related processes are not mentioned on levels 4 and 5. TMMi makes it possible to improve the testing processes above level 3, reaching maturity levels 4 and 5. This is another advantage of using TMMi.