TMMi FOUNDATION

Benefits of TMMi in Software Testing

A ChatGPT experiment

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www.tmmi.org

The purpose of this paper is to explore the benefits of the Test Maturity Model integration (TMMi) in software testing. The TMMi is a framework used to evaluate and improve the testing processes of an organization. The benefits of TMMi include improved testing efficiency, increased software quality, reduced costs, and improved customer satisfaction. This paper will explore each of these benefits and provide real-world examples of organizations that have implemented TMMi and achieved these benefits.

The establishment of this paper started with asking a question to ChatGPT. In the context of getting more familiar with Artificial Intelligence, also important for the TMMi project “Testing AI-systems with TMMi”, ChatGPT was asked to provide a paper based on the following question: “What are the benefits of TMMi in software testing?” Received a “finished” paper in 5 seconds. Paragraphs 1, 2 and 4 of this paper are largely written by ChatGPT. At the end of this paper a short evaluation of this ChatGPT experience is provided.

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1 Introduction

Software testing is a critical part of the software development life cycle (SDLC). It is an activity that involves identifying defects in software products, ensuring software quality, and making sure that software products meet the requirements of the customer. Effective and efficient software testing can lead to improved software quality, reduced costs, and increased customer satisfaction. However, testing is often a complex and challenging activity, and organizations need to have a structured and well-defined testing process to achieve these benefits.

The Test Maturity Model integration (TMMi) is a framework that supports organizations in implementing and improving their testing processes. The TMMi offers a model that helps organizations evaluate their testing process maturity and provides guidelines for improving their testing processes. The TMMi is a comprehensive framework that covers all aspects of testing and offers a systematic approach to testing. In this short paper, we will explore the benefits of implementing TMMi in software testing.

2 Reported Benefits of TMMi

2.1 Improved Efficiency

Implementing TMMi improves testing efficiency by providing a structured approach to testing. The TMMi covers all aspects of testing, including test planning, test execution, test management, and test reporting. The TMMi provides guidelines for each of these processes, which enables organizations to optimize their testing processes. Through implementing TMMi, organizations can reduce the time and effort required for testing while still ensuring high-quality software products.

For example, Infosys, a multinational IT services company, implemented TMMi in its testing processes to improve efficiency. Infosys developed a test improvement framework based on the TMMi model. Through implementing TMMi, Infosys was able to improve the efficiency of its testing processes and reduce testing time by up to 24%.

2.2 Increased Software Quality

Implementing TMMi can lead to increased software quality by improving the testing processes. The TMMi provides guidelines for testing all aspects of software products, including functional testing, non-functional testing, regression testing, performance testing and security testing. Through implementing TMMi, organizations can ensure that their software products meet the required quality standards.

For example, Philips Healthcare a leading healthcare technology company, implemented TMMi in its testing processes to improve software quality. Philips Healthcare developed a process improvement program based on the TMMi model. Through implementing TMMi, Philips Healthcare was able to reduce the number of high priority defects by 64%.

2.3 Reduced Costs

Implementing TMMi can lead to reduced costs in testing by improving the efficiency of testing processes and reducing the number of defects. By reducing the number of defects, organizations can reduce the costs

associated with fixing defects. Additionally, by improving the efficiency of testing processes, organizations can reduce the time and effort required for testing activities, which can lead to overall cost savings.

For example, Cisco, a multinational technology company, implemented TMMi in its testing processes to achieve cost savings. Cisco developed a test process improvement program based on the TMMi model. Through implementing TMMi, Cisco was able to reduce the cost of testing by up to 50%.

2.4 Improved Customer Satisfaction

Implementing TMMi can lead to improved customer satisfaction by increasing software quality and reducing the number of defects. By providing high-quality software products that meet customer requirements, organizations can increase customer satisfaction.

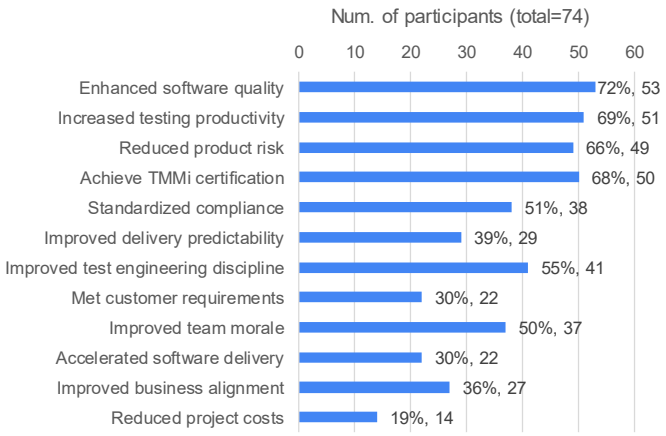
For example, Volvo Cars, a leading automotive company, implemented TMMi in its testing processes to improve customer satisfaction. Volvo Cars developed a test process improvement program based on the TMMi model. Through implementing TMMi, Volvo Cars was able to improve customer satisfaction by reducing the number of defects in its software products.

3 The TMMi World-Wide User Survey

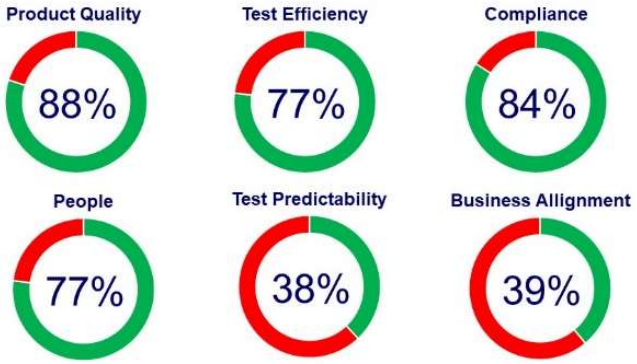
TMMi Foundation designed and conducted an international user survey[1], which received data from 74 companies that had been subject to a TMMi assessment and achieved certification. In this paper we provide the survey results regarding benefits of adopting the TMMi.

For asking about the benefits of adopting TMMi, the survey had the same set of 12 pre-defined response items (see figure below). Enhancing software quality, increasing testing productivity, and reducing product risk are observed benefits of adopting TMMi, by the responding organizations. Achieving TMMi certification is also reported to be a benefit. An interesting finding is that the internal factors of improved test engineering discipline and improved team morale are also reported to be major benefits. They can almost be considered “free” bonus when implementing TMMi. Reduced project costs are the least experienced benefit of adopting TMMi.

[1] The full TMMi world-wide user survey report is available on www.tmmi.org.
A more detailed paper on the survey is also available “Motivations for and Benefits of Adopting the TMMi”, in: The Next Big Thing in Software Engineering and Quality, May 2022, Springer Publishing



The list of motivations/benefits part from the survey was designed such that they can be categorized under six headings: product quality, test efficiency, compliance, people, test predictability, and business alignment. For example, reduced product risks and reduced number of defects both contribute to product quality, increased testing productivity contributes to test efficiency, and an improved test engineering discipline and improved team morale contribute to the people aspect. Changing the view from the individual benefits to the categorized one provided the outcome shown the figure below.



A high percent, 88% of the TMMi users are observing benefits for product quality (e.g,. reduced product risks and/or reduced number of defects). Benefits are also commonly observed in terms of test efficiency (77%), compliance (84%), and regarding the people aspect (77%). Test predictability and business alignment both have a lower score.

4 Conclusion

The Test Maturity Model integration (TMMi) is a framework that helps organizations to evaluate, implement and improve their testing processes. The benefits of implementing TMMi include improved testing efficiency, increased software quality, reduced costs, and improved customer satisfaction. These benefits have been achieved by organizations such as Infosys, Philips Healthcare, Cisco, and Volvo Cars, who have all implemented TMMi in their testing processes. The benefits reported by these individual companies are also supported by the results of the TMMi world-wide user survey. Through implementing TMMi, organizations can optimize their testing processes and achieve high-quality software products that meet customer requirements.

5 The ChatGPT experiment

In the context of getting more familiar with Artificial Intelligence (AI), ChatGPT was asked to provide a paper based on the following question: "What are the benefits of TMMi in software testing?" Within less than 5 seconds a paper was generated. The short paper was well written and only contained one major error. Case studies, unfortunately without reference and hard to trace, were provided with some of them even being unknown to the TMMi Foundation. In summary an impressive and interesting performance. Note that to make the paper more interesting for the reader a paragraph with benefit results from the 1st TMMi world-wide user survey was added by the author.

From the currently running 2nd world-wide user survey, we are learning that approximately 30% of the TMMi users are already involved in (testing) AI-systems. We of course need to make the important distinction between testing of AI-systems and using AI in our testing processes. Artificial Intelligence is here to stay, has a huge number interesting possibilities but also brings risks for the society as a whole. The TMMi working party "Testing AI-systems with TMMi" will address how to use TMMi, e.g., how to interpret the TMMi goals and what are alternative testing practices, when testing AI-systems.

Author

Erik van Veenendaal (www.erikvanveenendaal.nl) is a leading international consultant and trainer, and a recognized expert in the area of software testing. He is the author of a number of books and papers within the profession, one of the core developers of the TMap testing methodology and the TMMi test improvement model, and currently the CEO of the TMMi Foundation. Erik is a frequent keynote and tutorial speaker at international testing conferences. For his major contribution to the field of testing, Erik received the European Testing Excellence Award and the ISTQB International Testing Excellence Award.