

Test Process Improvement (TPI[®])

What is TPI[®]?

Test Process Improvement (TPI[®]) is a consulting service that measures a company's current software testing processes. It then benchmarks the result against a framework of world's best practices. The outcome of this evaluation is a report that details the steps required to optimise the software testing process.

Benefits of TPI[®]

The key to optimising a company's software testing initiative lies in optimising its processes. This results in a **structured approach to software testing** ensuring that the projects are:

- predictable,
- repeatable, and
- measurable.

Benefits of Effective Software Testing

Implementing software testing allows companies to identify faults in their software before their customers do. This is vital because it allows companies to maintain credibility – something worth far more than the cost of testing and fixing the code.

Contrary to popular belief, the primary goal of effective software testing is not to prove that the system works or even to find faults but, rather, it is to **reduce rework**. It is only through reducing rework that the true benefits of software testing are gained (e.g. cost and time savings during development). Savings in terms of rework alone can often pay for the entire software testing initiative several times over.

Benefits of the TPI[®] Model

Even though software testing can produce significant cost and time savings, in practice, implementing excellent software testing is often an elusive target. This is because software testing is intricately linked to a number of interdependent factors.

Test and Data Services follows a two-tier approach to build effective software testing centres for companies: The first part of this approach is the TPI[®] consulting service.

Tier 1: TPI[®] – A simple, reliable plan of action

The TPI[®] analysis results in a report that details a prioritised plan of action. This shows the steps needed in order to achieve the next level of testing maturity. The TPI[®] Model has been based on worldwide comprehensive research. This means that it is able to cater for diverse testing environments. It is a reliable and clear model for evaluating a testing environment's current status as well as a method for implementing improvements.

Tier 2: Flexible implementation

Test and Data Services provides a consulting service that can oversee the implementation of the TPI[®] report recommendations. However, the reports are intentionally written in a way that makes it possible for the client to implement the recommendations itself.

International Accreditation

The TPI[®] Model is based on the research of leading international testing experts, Tim Koomen and Martin Pol. Much of this research is documented in their book *Test Process Improvement: A Practical Step-By-Step Guide to Structured Testing* (1999). The TPI[®] Model assists companies in achieving standards such as TMap[®] (Test Management Approach) and CMM[®] (Capability Maturity Model[®]) Level 3.

How does the TPI[®] Model work?

The fundamental processes

The model focuses on **twenty key areas** of software testing. These key areas comprise the fundamental processes upon which structured testing is dependent. These areas are testing-specific, but they also address dependencies from other software development processes.

Ten of the key areas used in the TPI[®] analysis are described in the table below:

	Key Area	Description
1	Test Strategy	This determines how efficiently faults are detected.
2	Life Cycle Model	Testing activities should be performed in phases, namely, planning, specification, execution, reporting and completion.
3	Moment of Involvement	The cost-effectiveness of testing is greatly increased by introducing testing into development at the appropriate point.
4	Estimating and Planning	This area looks at how testing tasks and phases are budgeted and planned for.
5	Test Specification Techniques	There should be a standardised way of deriving tests from source documents and requirements.
6	Metrics	Metrics are important in quantifying the effectiveness of testing.
7	Test Automation	This addresses the way in which the testing tools are used and the way in which scripting is done.
8	Test Functions and Training	This deals with the composition and skills of the test team staff.
9	Scope of Methodology	Testing methodology must be flexible enough to cater for different situations but must still ensure that processes and documents are standardised.
10	Defect Management	Defect management not only involves the logging and reporting of defects, but also the management of those defects.

The maturity levels

For each of the twenty key areas of software testing, a level of maturity is established. These levels are divided into three main categories:

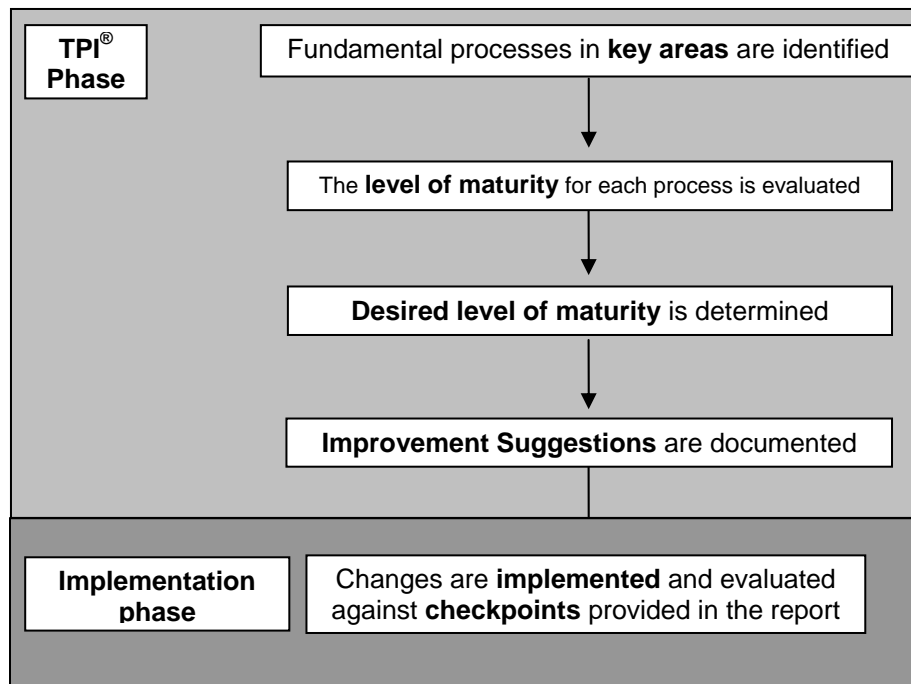
- controlled processes,
- efficient processes, and
- optimised processes.

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Determining maturity

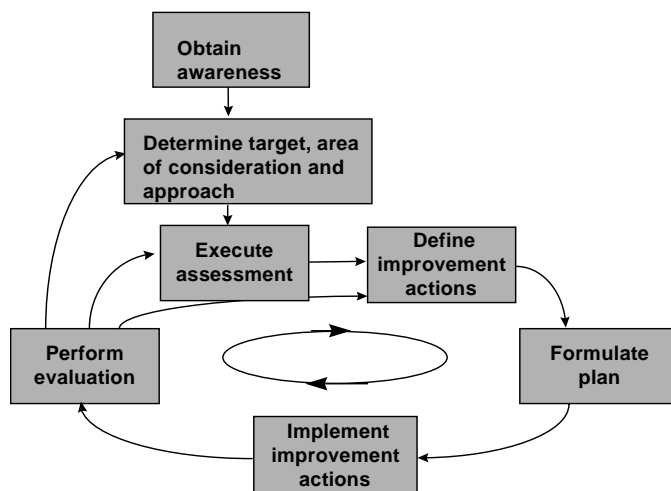
Checkpoints are used to determine the level of maturity for each of the twenty key areas. The continued use of these checkpoints provides a clear indication of the company's progress in attaining specific levels of maturity. Once the current level has been identified for each of the key areas, a plan of improvement can be developed.

The following diagram is a basic illustration of the methodology behind the TPI® Model.



Application of the TPI® Model

Once a company's required maturity levels are determined, a change process must be adopted that best achieves these levels.



Advantages of the TPI[®] report:

- **Small incremental steps** are described, allowing companies to improve their processes at their own pace.
- **Interdependencies** between software testing and other activities are taken into account.
- Since the TPI[®] Model has been built on **world's best practices**; vital steps in the improvement process will not be overlooked. Because company's specific needs will be evaluated, the TPI[®] Model will be **adapted** to meet those needs.
- **Milestones and checkpoints** for the company's progress will be set. This facilitates managing the progress of the TPI[®] implementation.
- The client has the **flexibility** to determine the extent they want to improve their processes as well as the time frame for implementation.

Conclusion

The TPI[®] Model has been based on extensive research on software testing teams around the world. The most effective teams have differentiated themselves through processes that are measurable, repeatable and predictable. The result of the TPI[®] service is a document, which provides a methodical approach to achieving this in a company's specific environment.

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