



BEST PRACTICE Test Process Improvement Model

A model for test process improvement has these eight steps:

1. Examine the Organization's Needs and Business Goals

A process improvement program starts with the recognition of the organization's needs and business goals, usually based on the main drivers and stimuli identified. From an analysis of the organizations needs and existing stimuli for improvement, the objectives of process improvement are identified and described. The final stage of the preliminary definition of the goals for the improvement program is setting the priorities of the process improvement objectives.

Once the analysis of the organization's needs and business goals has been completed, it is essential to build executive awareness of the necessity for a process improvement program. This requires both managerial and financial commitments.

The objectives of such a process improvement program should be clearly stated and understood, and expressed using measurable process goals. The process improvement program should form part of the organizations overall strategic business plan.

2. Conduct Assessment

The assessment should be conducted according to a documented process. Assessors must have access to appropriate guidance on how to conduct the assessment and the necessary competence to use the tools.

Each process is assessed by detailed examination. A rating is assigned and validated for each process attribute assessed. In order to provide the basis for repeatability across assessments, the defined set of indicators is used during the assessment to support the assessors' judgment in rating process attributes.

Objective evidence based on the indicators that support the assessors' judgment of the ratings are recorded and maintained to provide the basis for verification of the ratings.

3. Initiate Process Improvement



The process improvement program is a project in its own right, and planned and managed accordingly. A plan should be produced at the beginning of the program and subsequently used to monitor progress. The plan should include the relevant background, history, and the current status, if possible expressed in specific, numerical terms. The input derived from the organization's needs and business goals provide the main requirements for the plan.

The plan should include a preliminary identification of the scope in terms of the boundaries for the program and the processes to be improved. The plan should cover all the process improvement steps, although initially it may give only outline indications of the later stages. It is important to ensure that key roles are clearly identified; adequate resources allocated, appropriate milestones and review points established, and all risks are identified and documented in the plan. The plan should also include activities to keep all those affected by the improvement informed of progress.

4. Analyze Assessment Output and Derive Action Plan

Information collected during the assessment, in particular the capability level ratings, the generic practice ratings, and the base practice ratings, is first analyzed, and a plan of action is derived. This consists of the following activities:

- Identify and prioritize improvement areas.
- Analyze assessment results. Analysis of the results provides information about the variability as well as current strengths and weaknesses and indicates opportunities for improvement.
- Analyze the organization's needs and improvement goals. The processes and their relationships are analyzed to evaluate which have direct impact on the goals identified. A priority list of processes to be improved is then derived.
- Analyze effectiveness measurements.
- Analyze the risks in not achieving improvement goals. The impact of failing to achieve improvement goals is evaluated in order to understand the urgency and to set the priority of initiatives.
- Analyze risks of improvement action failure. The potential risks of failure of an improvement action is analyzed to support the



definition of priorities and to assure commitment and organizational support.

- List improvement areas. A prioritized list of improvement areas is provided as a result of analyzing all the factors listed above.
- Define specific improvement goals and set targets. Targets for improvement should be quantified for each priority area.
- Derive action plan. A set of actions to improve processes should be developed. Care should be taken to select a set of actions, which support each other in achieving the complete set of goals and targets. It is desirable also to include some improvement actions, which yield clear short-term benefits in order to encourage acceptance of the process improvement program.

5. Implement Improvements

A process improvement action plan is implemented in order to improve the process. Implementation may be simple or complex depending on the contents of the action plan and the characteristics of the organization.

In practice, several process improvement projects will be initiated, each concerned with implementing one or more process improvement actions. Such projects will often not cover only initial implementation of improvements. Four main tasks are involved in each process improvement project:

- Operational approach to implementation. Where there are alternative operational approaches to implementation, they should be evaluated and the most suitable selected. It may be possible to implement in small steps through piloting in a selected unit or throughout the whole organization at the same time, or somewhere between these two extremes. Among the factors to consider are costs, time scales, and risks.
- Detailed implementation planning. A detailed implementation plan is then developed. The process improvement project may need to carry out a deeper analysis of improvement opportunities than that already carried out. Those implementing the actions and those affected by them should be involved, or be consulted, in developing the plan and in evaluating alternatives, in order to draw both on their expertise and enlist their cooperation.
- Implementing improvement actions. During this activity, it is critical for successful improvement that due account is taken of human and cultural factors.



- Monitoring the process improvement project. The organization's management against the process improvement project plan should monitor the process improvement project. Records should be kept for use to both confirm the improvements, and to improve the process of process improvement.

6. Confirm Improvements

Management as well as stakeholders must be involved both to approve the results and to evaluate whether the organization's needs have been met. If, after improvement actions have been taken, measurements show that process goals and improvement targets have not been achieved, it may be desirable to redefine the project or activity by returning to an appropriate earlier step.

- Improvement targets. Current measurements of process effectiveness should be used to confirm achievement of process effectiveness targets. The possibility of having introduced desirable or undesirable side effects should be investigated.
- A further process assessment should be used to confirm achievement of targets expressed as process capability levels. Where several improvement projects were undertaken, however, consideration should be given to a reassessment of wider scope to check for potential side effects arising from the parallel improvement actions.
- Organizational culture. The effect of the improvements on organizational culture should be reviewed to establish that desired changes have taken place without undesirable side effects.
- Re-evaluate risks. The organization should re-evaluate the risks of using the improved process to confirm that they remain acceptable, and if they are not, determine what further actions are required.
- Re-evaluate cost benefit. The costs and benefits of the improvements may be reevaluated and compared with earlier estimates made. These results are useful to support planning of subsequent improvement actions.

7. Sustain Improvement Gains



After improvement has been confirmed, the process needs to be sustained at the new level of performance. This requires management to monitor institutionalization of the improved process and to give encouragement when necessary. Responsibilities for monitoring should be defined, as well as how this will be done by using appropriate effectiveness measurements.

If an improved process has been piloted in a restricted area or on a specific project or group of projects, it should be deployed across all areas or projects in the organization where it is applicable. This deployment should be properly planned and the necessary resources assigned to it. The plan should be documented as part of the process improvement project plan or the process improvement program plan as appropriate.

8. Monitor Performance

The performance of the process should be continuously monitored. New process improvement projects should be selected and implemented as part of a continuing process improvement program, since additional improvements are always possible.

- Monitoring performance of the process. The performance of the process should be monitored as it evolves over time. The effectiveness and conformance measures used for this should be chosen to suit the organization's needs and business goals, and should be regularly reviewed for continuing suitability. The risks to the organization and its products from using the process should also be monitored and action taken as risks materialize or become unacceptable.
- Reviewing the process improvement program. Management should review the process improvement program regularly. Further process assessments can be an important component of the continuing improvement program. The extent to which improved processes have been institutionalized should be considered before scheduling further process assessments. It may be more cost-effective to delay assessing a process until improvements have been fully deployed, rather than expend resources assessing a process, which is in transition, when the results can be difficult to interpret.

The bottom line of assessment is making application system testing more effective. This is performed by a careful analysis of the results of testing, and then taking action to correct identified weaknesses. Facts precede action, and



testing in many organizations has suffered from the lack of facts. Once those facts have been determined, action should be taken.

The “measurement first, action second” concept is effective when the measurement process is specific. Measurement must be able to determine the effect of action. For example, the metric approach fulfills this requirement in that it shows very specific relationships. Using this concept, if action is taken by changing one of the metric variables, the result of that action can be quickly measured.

Changing the variable in one metric can normally be measured by the change in another metric. For example, if the number of defects detected after the system goes operational is higher than desirable, then action should be taken. The action taken might be to increase the number of instructions exercised during testing. Obviously, this increases test cost with the hopeful objective of reducing undetected defects prior to operation. On the other hand, if increasing the number of instructions executed does not reduce the number of defects undetected prior to production, then those resources have not been used effectively and that action should be eliminated and another action tried.

Using the measurement/action approach, the variables can be manipulated until the desired result is achieved. Without the measurement, management can never be sure that intuitive or judgmental actions are effective. The measurement/action approach works and should be followed to improve the test process.

References

Guide – CSQA Common Body Of Knowledge, V6.2