

The underlying premise of software process management is that the quality of a software product is largely determined by the quality of the process used to develop and maintain it. An effective software process ties together people, tools, and methods into an integrated whole.

Software process capability describes the range of expected results that can be achieved by following a software process. The software process capability of an organization provides one means of predicting the most likely outcomes to be expected from the next software project the organization undertakes.

Software process performance represents the actual results achieved by following a software process. Thus software process performance focuses on the results achieved, while software process capability focuses on results expected.

Software process maturity is the extent to which a specific process is explicitly defined, managed, measured, controlled, and effective. Maturity implies a potential for growth in capability and indicates both the richness of an organization's software process and the consistency with which it is applied in projects throughout the organization.

Software process maturity implies that software process capability must be grown. Improvement requires strong management support and a consistent long-term focus. As a software organization matures, it needs an infrastructure and culture to support its methods, practices, and procedures so that they endure after those who originally defined them have gone.

Organizational culture can be summed up as "that's the way we do things around here." It is seen in people's expectations for how they are to work together. One of the determinants of organizational culture is its infrastructure. *Infrastructure* is the underlying framework of an organization or system, including organizational structures, policies, standards, training, facilities, and tools, that supports its ongoing performance.

Institutionalization is the building of infrastructure and culture to support the methods, practices, and procedures so that they are the ongoing way of doing business. The result of institutionalization is the deployment of software processes that are effective, usable, and consistently applied across the organization.

The purpose of Requirements Management is to establish a common understanding between the customer and the software project of the customer's requirements to be addressed by the software project. This agreement with the customer is the basis for planning and managing the software project.

An understanding of the requirements is necessary to build software that will satisfy the customer. Reviewing the requirements allocated to software and interacting with the customer (whether external or internal) is part of establishing that understanding. Since the customer's requirements will frequently evolve and change, documenting and controlling the customer requirements is a prerequisite to using them as the basis for estimating, planning, performing, and tracking the software project's activities throughout the software life cycle.

Steps

Collection

Gather possible requirements

Classification

Categorize them into groups

Documentation

Make this accessible to those who need it

Prioritization

Determine which are most important

Tracking

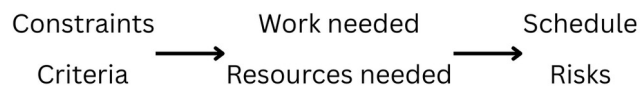
Make sure they continue to be useful

The purpose of Software Project Planning is to establish reasonable plans for performing the software engineering and for managing the software project.

Reasonable plans are based on developing realistic estimates for the work to be performed and establishing the necessary commitments to perform that work. They begin with a statement of the work and the constraints and goals that define and bound the software project. The software planning process includes steps to estimate the size of the software work products and the resources needed, to produce a schedule, to identify and assess software risks, and to negotiate commitments. The plan is documented and maintained as a necessary tool for managing the software project.

The purpose of Software Project Tracking and Oversight is to establish adequate visibility into actual progress so that management can take effective actions when the software project's performance deviates significantly from the software plans.

Management of the software project should be based on the software development plan. Management involves tracking and reviewing the software accomplishments and results against the plan and taking corrective action as necessary based on actual accomplishments and results. These actions may include revising the software development plan to reflect the actual accomplishments, replanning the remaining work, and/or taking actions to improve the performance.



The purpose of Software Quality Assurance is to provide management with appropriate visibility into the process being used by the software project and of the products being built.

This visibility is achieved by reviewing and auditing the software products and activities to verify that they comply with the applicable standards and procedures. Compliance issues are first addressed within the software project and resolved there if possible. For issues not resolved within the software project, the software quality assurance group escalates the issue as appropriate for resolution.

The purpose of Software Configuration Management is to establish and maintain the integrity of the products of the software project throughout the project's software life cycle.

Integrity of work products is achieved by identifying the configuration of the software (i.e., selected software work products and their descriptions) at given points in time, systematically controlling changes to the configuration, and maintaining the integrity and traceability of the configuration throughout the software life cycle. Software baselines are maintained in a software baseline library as they are developed. Changes to baselines and the release of software products built from the software baseline library are systematically controlled via the change control and configuration auditing functions of Software Configuration Management.

