

ISO 15504

ISO/IEC 15504 also known as **SPICE** (Software Process Improvement and Capability dEtermination) is a "framework for the assessment of software processes" developed by the Joint Technical Subcommittee between ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission).

ISO/IEC 15504 derives from ISO 12207 and uses many of the ideas of CMMI.

1 Overview

The ISO/IEC 15504 framework does not set out specific standards. Other, more specific standards, set out requirements for (say) a valid test plan. What ISO/IEC 15504 is concerned about is the capability provided by the organization's management and process definition structures.

ISO/IEC 15504 is not a methodology. Although ISO/IEC 15504 sets out a list of activities that might (and should) occur in a software project, it does not set out the order in which such activities should be carried out.

ISO/IEC 15504 is, in effect, a set of categories (pigeon holes) in which the assessors can place the evidence that they collect during their assessment, so that the assessors can give an overall determination of the organisation's capabilities for delivering software.

ISO/IEC 15504 has been developed by the Joint Technical Subcommittee between ISO (International Organization for Standardization) and IEC (International Electrotechnical Committee).

2 The ISO/IEC 15504 standard

The Technical Report (TR) document for ISO/IEC TR 15504 is divided into 9 parts. But IS version of ISO/IEC 15504 is divided into 5 parts. This is proposed from Japan when the TRs were published at 1997.

Part 1 of ISO/IEC TR 15504 explains the concepts and gives an overview of the framework.

Nationality of editors of ISO/IEC 15504 5 parts are below.

Part 1, Japan, South Africa. Part 2, Japan, U.K. Part 3, U.S.A, Italy. Part 4, U.K., Israel. Part 5, France, Finland.

2.1 Reference model

ISO/IEC 15504 contains a reference model. The reference model defines a process dimension and a capability dimension.

The reference model is not the subject of part 2 of ISO/IEC 15504, now. The assessment model is part5, reference model of process dimension is IOS/IEC 12207 annex.

2.2 Processes

The process dimension defines processes divided into the five process categories of:

- customer-supplier
- engineering
- supporting
- management
- organization

2.3 *Capability levels and process attributes*

For each process, ISO/IEC 15504 defines a capability level on the following scale:

Level	Name
5	Optimizing
4	Predictable
3	Established
2	Managed
1	Performed
0	Incomplete

The capability of processes is measured using process attributes. The international standard defines nine process attributes:

- 1.1 Process Performance
- 2.1 Performance Management
- 2.2 Work Product Management
- 3.1 Process Definition
- 3.2 Process Deployment
- 4.1 Process Measurement
- 4.2 Process Control
- 5.1 Process Innovation
- 5.2 Process Optimization.

Each process attribute is assessed on a four-point (N-P-L-F) rating scale:

- Not achieved (0 - 15%)
- Partially achieved (>15% - 50%)
- Largely achieved (>50%- 85%)
- Fully achieved (>85% - 100%).

2.4 *Assessments*

ISO/IEC 15504 provides a guide for performing an assessment.

This includes:

- the assessment process
- the model for the assessment
- any tools used in the assessment

- success factors

Performing assessments is the subject of parts 3 and 4 of ISO/IEC TR 15504. Part 3 is the normative part and part 4 gives a guidance to fulfill the requirements.

2.4.1 Assessment model

The assessment model is the detailed model that is used for an actual assessment. This is an elaboration of the reference model.

Part 5 of ISO/IEC TR 15504 provides an assessment model, but other models could be used instead, if they meet ISO/IEC 15504's criteria.

2.4.2 Assessors

For a successful assessment, the assessor must have a suitable level of the relevant skills.

These skills include:

- personal qualities such as communication skills
- relevant education and training and experience
- specific skills for particular categories, e.g. management skills for the management category.
- training and experience in software capability assessments.

The competency of assessors is the subject of part 6 of ISO/IEC TR 15504.

3 Uses of ISO/IEC 15504

ISO/IEC 15504 can be used in two contexts:

- Process improvement, and
- Capability determination (= evaluation of supplier's process capability).

3.1 Process improvement

ISO/IEC 15504 can be used to perform process improvement within a technology organization. Process improvement is always difficult, and initiatives often fail, so it is important to understand the initial baseline level, and to assess the situation after an improvement project. ISO 15504 provides a standard for assessing the organization's capacity to deliver at each of these stages.

In particular, the reference framework of ISO/IEC 15504 provides a structure for defining objectives, which facilitates specific programs to achieve these objectives.

Process improvement is the subject of part 7 of ISO/IEC 15504.

3.2 Capability determination

An organization considering outsourcing software development needs to have a good understanding of the capability of potential suppliers to deliver.

ISO/IEC 15504 can also be used to inform supplier selection decisions. The ISO/IEC 15504 framework provides a framework for assessing proposed suppliers, as assessed either by the organization itself, or by an independent assessor.

The organization can determine a target capability for suppliers, based on the organization's needs, and then assess suppliers against this profile. This is particularly important in contexts where the organization (for example, a government department) is required to accept the cheapest qualifying tender. This also enables

suppliers to identify gaps between their current capability and the level required by a potential customer, and to undertake improvement to make the contract. Work on extending the value of capability determination includes a method called Practical Process Profiles - which uses risk as the determining factor in setting target profiles. Combining risk and processes promotes improvement with active risk reduction, hence reducing the likelihood of problems occurring.

Supplier process evaluation has been merged into Part 8 of ISO/IEC 15504.