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## Guidelines for Process Definition Version 6

### Document history

This document is a revision of Draft 5 of the Proposed SWG 3 response to SC 7 Resolution 600 that was distributed for letter ballot within SC 7 as N2497 in June 2001.

This revised document incorporates further experiences within WG 7 during the finalization of ISO/IEC 15288. The key change is refinement of the Purpose Attribute.

### Authorization

Resolution 600 from the ISO/IEC JTC 1/SC 7 plenary in 2000 reads as follows:

*JTC 1/SC 7 instruct its SWG 3 to:*

- *Come with a proposition of what shall be stated in process [activities and] outcomes (which content, which level of prescription);*
- *Review this proposal with JTC 1/SC 7/WG 7 and JTC 1/SC 7/WG 10*
- *Submit the proposal to the JTC 1/SC 7 Secretariat for endorsement by the Member Bodies.*

### Background

A number of the standards and technical reports of SC 7 describe processes in different manners. The purpose of this document is to encourage uniformity in the description of processes.

Some convergence has already occurred. WG 7 and WG 10 have agreed that processes can be described at a summary level by the use of *Title*, *Purpose* and *Outcomes*. This form of description is suitable as a starting point for both process definition and process assessment.

In addition, ISO/IEC 12207 and ISO/IEC 15288 define life cycle processes by using additional forms of description, including *Activities*.

It is desirable to develop a common characterization of all of these forms of process description so that future standards of SC 7, as well as revisions of current standards, can select the appropriate forms of process description and apply them in a consistent fashion.

### Purpose

The purpose of this document is to characterize the following attributes of process description:

- Title
- Purpose
- Outcomes
- Activities

This document does not deal with descriptions of how processes are composed or otherwise aggregated into larger frameworks or architectures. Such work would be useful but is not within the scope of Resolution 600.

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## Intended Audience

The audience intended for this document are the editors, working group members, and other participants in the development of SC 7 standards and technical reports. It is intended that they will select the process description attributes suitable for their project from those described in this document. It is further intended, that having selected the appropriate attributes, they will apply them in a manner consistent with the guidance provided by this document.

## Existing Agreements

As a result of discussion between WG 7 and WG 10 regarding the respective roles of ISO/IEC 12207, its amendment AMD1:2002, ISO/IEC 15288, ISO/IEC TR 15504 and its revision as a standard, a few agreements have been reached for the coordination of their work.

It is agreed that one should describe the goals and objectives in executing a process by using the attributes of title, purpose and outcomes. These attributes are used to describe intended results without the necessity of performing structural decomposition of the process. Processes described using title, purpose and outcomes provide a common starting point for process definition and process assessment.

The definition of life cycle processes falls within the scope of WG 7. The existing standards in this area are ISO/IEC 12207 and ISO/IEC 15288. These standards provide further characterization of life cycle processes by further decomposing them and levying specific requirements on their execution. The decomposition is described by use of the activity attribute.

In short, the existing extent of agreement can be characterized as follows:

- The **title** conveys the concept of the process as a whole.
- The **purpose** formulates the aim, the usefulness of the process.
- The **outcomes** express the objectives expected from the successful performance of the process.
- The **activities** decompose the process to state what the process does to obtain the outcomes.

Again, it should be noted that not all attributes are needed in all documents. Suitable attributes should be selected to match the purpose of the document.

## Characterizing the Attributes

In order to enable various working groups to apply the attributes in a uniform manner, additional characterization of the attributes would be helpful. The remainder of this document provides that characterization.

### The Title Attribute

The title of a process is a short noun phrase intended to summarize the scope of the process, identify the principal concern of the process, and distinguish it from other processes. Because of the latter criterion, it may sometimes be necessary to change the title of a process. For example, one might have a "software quality process" which is later renamed as a "software process quality assurance process" to distinguish it from a newly invented "software product quality assurance process".

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## The Purpose Attribute

The purpose of the process is stated as a high level, overall goal for performing the process. The implementation of the process should provide tangible benefits to the stakeholders through the expected outcomes. In cases where processes might be thought to overlap, the purpose should be used to characterize the scope or bounds of the process.

Whenever possible, the purpose should be succinctly captured in a single sentence. Use of the conjunction "and" to connect multiple clauses should be avoided as it would indicate that the description is being written as a conjunction of outcomes rather than as a statement of a single purpose. The purpose attribute shall begin with the words, "The purpose of the xxx process is ...". The phrase "... in order to ..." may be useful in recording the benefit of the process.

Further elaboration of the statement of purpose may be contained in a second paragraph.

## The Outcomes Attribute

An outcome is an observable result of the successful achievement of the process purpose. Although any result may be observable, it is the benefit that motivates the party to execute the process.

- The list of outcomes associated with a process shall be prefaced by the text, "As a result of successful implementation of this process:".
- An outcome shall be phrased as a declarative sentence using a verb in the present tense. (For example, if the preceding sentence were phrased as an outcome, it might read, "Outcomes are phrased as declarative sentences using verbs in the present tense.") Typically, the verb is "is" or "are" although others may be used when appropriate.
- Each outcome should be no longer than one line of text, about a dozen words.
- The number of outcomes for a process should fall within the range 2 to 6.
- Outcomes should be expressed in terms of a positive objective, e.g. the production of an artefact, the provision of a service, a significant change of state, the meeting of specified constraints (such as requirements, goals, etc).
- Although an outcome should express a tangible result, it is not necessary to express the outcome as the production of a document.
- An outcome should express a single result. Hence, the use of the word "and" or "and/or" to conjoin clauses should be avoided; such constructions are better expressed as multiple outcomes.
- Outcomes should be written in a manner that is applicable to organizations of any size or line of business.
- Taken as a group, achieving the outcomes of a process should not require the implementation of a process at any capability level higher than 1. (Capability levels are defined by the forthcoming ISO/IEC 15504; temporarily, they are defined by ISO/IEC TR 15504.)
- Outcomes should not require any specific method, technique or tool.
- Outcomes should not require any specific process metrics or management methods.
- Outcomes should not be written in a manner that presumes any particular sequence of execution nor should the reader be expected to presume any sequence.
- Any outcome should be the result of executing the entire process. (A result of partial execution of a process is better described by writing activities to decompose the process.)

- Although outcomes should be meaningful and understandable when viewed in isolation, they should be based on terminology and concepts that are further explained by other material in the document.

An example of applying these rules is as follows:

PDAM1 of 12207	<p><b>Supplier monitoring</b></p> <p>Purpose:</p> <p>The purpose of <i>Supplier monitoring</i> is to track and assess performance of the supplier against agreed requirements.</p> <p>Outcomes:</p> <ul style="list-style-type: none"> <li>▪ joint activities between customer and supplier shall be performed as needed</li> <li>▪ information on technical progress shall be exchanged regularly with the supplier</li> <li>▪ performance of the supplier shall be monitored against the agreed requirements</li> </ul>
Possible new phrasing	<p><b>Supplier Monitoring</b></p> <p>Purpose:</p> <p>The purpose of <i>Supplier Monitoring</i> is to keep up communication with the supplier in order to maintain visibility of progress, risks and commitments.</p> <p>Outcomes:</p> <p>As a result of successful implementation of this process:</p> <ul style="list-style-type: none"> <li>▪ joint activities between customer and supplier are performed</li> <li>▪ information on technical progress is exchanged regularly with the supplier</li> <li>▪ performance of the supplier is monitored against the agreed requirements</li> </ul>

### The Activities Attribute

The Activities attribute is used to provide a structural decomposition of a process. Rather than describing the results of executing a process, activities provide a finer level description of the actions that are performed in the execution of the process.

The set of activities associated with a process should "cover" the process. In other words, any action falling within the scope of a process must fall within the scope of one of the activities of the process.

Ideally, the definition of the activities of a process achieves a goal of "cohesion," in the same sense as that term applies to software design. The actions within a single activity should be strongly related to each other and weakly related to those of other activities.

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It should not be assumed that the reader of a set of activities will make any presumption about time-sequencing or other dependencies among the activities. Any assumptions or requirements of time-sequence or other dependencies must be explicitly stated. Thus, activities are not to be regarded as "steps" in performing a procedure. Instead, they are to be regarded as *continuing responsibilities* but with a scope smaller than that of the entire process.

**Note: The Use of the Term "Task" in ISO/IEC 12207:1995**

(The use of the term "task" is not harmonized by this document. This section is provided only for information.)

According to ISO/IEC TR 15271, clause 4.3.4:

- "Each process is further defined in terms of its own constituent activities, each of which is further defined in terms of its constituent tasks. An activity within a process is a set of cohesive tasks."
- "A task is expressed in the form of a requirement, self-declaration, recommendation, or permissible action."

ISO/IEC 12207 uses the term **task** to describe clauses of the standard that prescribe specific requirements, or recommendations on the execution of a conforming process. In the more general case of ISO/IEC standardization, this concept is usually termed **provision**.

Unlike the process/activity relationship, the set of tasks within an activity is not required to "cover" the activity. (If it were, then the writers of ISO/IEC 12207 would have had to write a task regarding every item conceivable within the scope of an activity.) If we think in terms of Venn diagrams, then the total areas of all of the activities equal the area of the process. The tasks, however, are points within the activities.

It is not to be assumed that the reader of a set of tasks will make any presumption about time-sequencing or other dependencies among the tasks. Therefore, any assumptions of time-sequencing or other dependencies are explicitly stated.