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Information technology — Process assessment —

Part 9: Target process profiles

Technologies de l'information — Évaluation des procédés —

Partie 9: Profils de procédés cibles

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, the joint technical committee may decide to publish an ISO/IEC Technical Specification (ISO/IEC TS), which represents an agreement between the members of the joint technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/IEC TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/IEC TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC TS 15504-9 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

ISO/IEC 15504 consists of the following parts, under the general title *Information technology — Process assessment*:

— *Part 1: Concepts and vocabulary*

— *Part 2: Performing an assessment*

— *Part 3: Guidance on performing an assessment*

— *Part 4: Guidance on use for process improvement and process capability determination*

— *Part 5: An exemplar Process Assessment Model*

— *Part 6: An exemplar system life cycle process assessment model* [Technical Report]

— *Part 7: Assessment of organizational maturity* [Technical Report]

— *Part 9: Target process profiles* [Technical Specification]

— *Part 10: Safety extension* [Technical Report]

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The following part is under preparation:

— *Part 8: An exemplar process assessment model for IT service management* [Technical Report]

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Introduction

ISO/IEC 15504 provides a framework for process assessment and sets out the minimum requirements for performing an assessment in order to ensure consistency and repeatability of assessment results. Process assessment is applicable in the following circumstances:

— by or on behalf of an organization with the objective of understanding the state of its own processes for process improvement;

— by or on behalf of an organization with the objective of determining the capability of another organization's processes for a particular contract or class of contracts, or to determine the capability of its own processes for a particular requirement or class of requirements.

Process assessment has two dimensions, a process dimension and a capability dimension. ISO/IEC 15504-2 specifies the measurement framework within the capability dimension. The process dimension is provided by an external process reference model, which describes a set of processes, each characterized by defined process purpose and process outcomes. ISO/IEC 15504-4:2004 describes the need for a target capability using the capability dimension in ISO/IEC 15504-2 for each process in a process reference model, appropriate to the specified requirements. This part of ISO/IEC 15504 provides guidance on how to create and utilize target process profiles to meet this need for a target capability.

This part of ISO/IEC 15504 is being developed as a Technical Specification to enable experience to be gained in the use of the approach to setting Target Process Profiles. In future revisions of ISO/IEC 15504, it is likely that the content of this part will be integrated with ISO/IEC 15504-4.

This part of ISO/IEC 15504 provides guidelines for creating and using a target process profile. These guidelines cover the following aspects:

a) the defined purpose of the target process profile as a process improvement initiative or for process capability determination;

b) the community of use, such as automotive, aerospace;

c) the business requirement;

d) the domain of application, such as systems, software, IT services management;

e) the characterization of the domain of application, such as safety critical systems;

f) applicable processes or process reference models (in whole or part), processes from one or more process reference models or defined process for the domain of application;

g) the data and information to be collected to ensure the profile is relevant to the community of use, business requirements, domain of application and characterization scheme;

h) the factors that, when analysed, transform the collected data or information into processes and process capability (process attributes and process attribute rating) to create a target process profile for a process at the defined characterization of domain of application of the business requirement for the community of use;

i) the expression of results, i.e. a target process profile for each required process, with data and notes that allow traceability and interpretation for assessment and improvement guidance purposes.

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Information technology — Process assessment —

Part 9:
Target process profiles

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1 Scope

This part of ISO/IEC 15504 documents guidelines for target process profiles for capability determination and improvement purposes. This part of ISO/IEC 15504 provides guidance for establishing target process profiles for the following purposes:

— by or on behalf of an organization with the objective of specifying a target process profile to meet specified needs;

— by or on behalf of an organization with the objective of specifying a target process profile against which to assess the actual ability of the organization to meet that target;

— by or on behalf of an organization with the objective of specifying a target process profile against which to assess the actual ability of another organization to meet that target;

— by or on behalf of an organization with the objective of determining the need for improvement based upon any capability gap between the actual capability and the target process profile.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendment) applies.

ISO/IEC 15504-1:2004, *Information technology — Process assessment — Part 1: Concepts and vocabulary*

ISO/IEC15504-2:2003, *Information technology — Process assessment — Part 2: Performing an assessment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 15504-1 and the following apply.

3.1
target process profile
process attributes and process attribute ratings required for a process or process capability level and process capability level rating required for a process, with the rationale for the ratings

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3.2
target capability
set of target process profiles, subject to an acceptable process related risk, which meet the specified requirement for process capability determination or the business goals for process improvement

NOTE This definition is based upon ISO/IEC 15504-4:2004, 7.2.2.

4 Overview

4.1 Introduction

Within ISO/IEC 15504, process assessment can be utilized:

— by or on behalf of an organization with the objective of understanding its processes for process improvement purposes;

— by or on behalf of an organization with the objective of determining the capability of another organization's processes for a particular contract or class of contracts, or to determine the capability of its own processes for a particular requirement or class of requirements.

Within a process improvement context, process assessment provides a means of characterizing an organizational unit in terms of the capability of selected processes. Analysis of the output of a conformant process assessment against an organizational unit's *business goals* identifies *strengths*, *weaknesses* and *risks* related to the processes. This, in turn, can help determine whether the processes are effective in achieving business goals, and provide the drivers for making improvements.

Process capability determination is concerned with analysing the output of one or more conformant process assessments to identify the *strengths*, *weaknesses* and *risks* involved in undertaking a specific project using the selected processes within a given organisational unit. A Process Capability Determination can provide a fundamental input to supplier selection, in which case it is often termed a “supplier capability determination”. Process Capability Determination requires a target profile.

A target process profile is derived from the defined business requirements, traceable to one or more process practice indicators and one or more process capability indicators that meet these requirements and can be used for process improvement or process capability determination.

4.2 Target process profiles sponsors and users

Target process profiles will usually be required and resourced by a target process profile sponsor for the purpose of process capability determination or process improvement – as described in ISO/IEC 15504-1:2004. The sponsor has the authority and responsibility to ensure that the target process profiles, the process assessment and any agreed actions are carried out effectively to meet the intended use, as described in ISO/IEC 15504-2:2003 (see note). For process capability determination, the Process Capability Determination sponsor should deploy a process capability determination process as outlined in ISO/IEC 15504-4:2004, 4.5. For process improvement, the Process Improvement sponsor should deploy a process improvement process as outlined in ISO/IEC 15504-4:2004, 4.4.

Defining target process profiles requires skill and experience of a nature similar to that required for an experienced lead assessor and assessment model developer. In order to correctly define a target process profile the sponsor, or sponsor appointed individual or team, should meet the following education and experience criteria:

— be a competent assessor (see ISO/IEC 15504-3);

— be able to demonstrate competence in using the selected documented process to create target process profiles under supervision of an experienced user of the documented process.

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A well defined target process profile set should provide guidance so that users of the profiles should only require minimal training and experience in order to be effective. In order to correctly use a target process profile, the sponsor or sponsor appointed user:

— has successfully selected a set of target process profiles under supervision of an experienced sponsor. The selected set of target process profiles correctly covers the intended use.

— is conversant with using ISO/IEC 15504 for process improvement or capability determination purposes.

NOTE The target process profiles sponsor may be independent of or may also be a process assessment sponsor.

4.3 Target process profiles purpose

The purpose of target process profiles is to identify the desired or required process capability for selected processes with respect to a particular intended use. Clause 5 of this part of ISO/IEC 15504 describes the detailed content of a set of target process profiles. As a result of successful establishment, a target process profile ensures the following criteria are met:

— the purpose is defined;

— the community of use is defined;

— the business requirement is defined;

— the intended domain of application is defined;

— the characterization required for the domain of application is documented;

— the applicable processes or process reference models for the domain of application are defined;

— the applicable process assessment model for the domain of application is defined;

— the data and information collected to create the target process profile is representative of all relevant aspects of the community of use for the defined characterization of the domain of application for the business requirement;

— the traceability from the input data to the resultant target process profile is documented;

— the process, process attributes and target rating for each process attribute, or process capability level rating, are derived from the identified indicators of process practice and process capability which are derived from the analyzed data and information;

— a defined expression of the target process profile result for each required process with data and notes that allow traceability and interpretation to be made by users;

— the usage criteria to assess the effectiveness of the target process profiles is documented. Usage criteria are covered in clause 6.3.1.

NOTE 1 The intended use is defined by the first five elements in the above list. The intended use becomes a defined requirement specifically based upon this set of elements. If any of these elements is changed the intended use changes and a target process profile should be checked to determine if it is still applicable or requires rework.

NOTE 2 A defined community of use could be at industry level, enterprise level, team or project level, or professional or technical level.

NOTE 3 A defined business requirement may be assurance that development of software for medical device systems meets safety standards; another may be assessing suppliers to ensure their deployment of security systems meet security standards.

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NOTE 4 The domain of application may cover systems, software and services; either individually or in combination.

NOTE 5 The characterization for the domain of application defines how this is further specified, and can consist of one or more forms of characterization. This can allow a separate profile per characterization. For example, if the domain of application is defined as medical software, there may be several levels of safety criticality, ranging from human safety critical to software with minor or no safety criticality.

NOTE 6 The community of use for a Target Capability can be defined independently of a community of interest for any related Process Reference Model.

4.4 Deploying a documented process

Organisations should deploy a documented process to specify target process profiles that meet an intended use. Clause 6 of this part of ISO/IEC 15504 describes in detail the content and performance of such a documented process. The intent of the documented process is to provide a reproducible and traceable target process profile. Such a documented process should:

— take account of the guidance contained within this part of ISO/IEC 15504;

— take account of the guidance contained within ISO/IEC 15504-4:2004;

— include or reference an assessment process which satisfies the requirements set out within ISO/IEC 15504-2:2003 and accords with the guidance set out in ISO/IEC 15504-3:2004;

— describe how to define the intended use of the target process profiles;

— describe the type of data and information needed to create a profile applicable to the intended use;

— describe the techniques and activities to create and use target process profiles and provide guidance in their use;

— describe the appropriate roles;

— describe the qualifications, experience and skills of persons using the documented process.

NOTE Training may be used to satisfy the need for qualifications and skills.

5 Target process profiles

5.1 General

The value of a target process profile is its ability to clearly address the process improvement and process capability determination needs described in clause 4. The set of target process profiles expresses the *target capability* which the sponsor judges to be adequate, subject to an acceptable *process related risk,* for meeting the defined business requirements (see note 1). A target process profile is derived from the defined business requirements, traceable to one or more process practice indicators and one or more process capability indicators that meet these requirements. These in turn enable the sponsor to select the appropriate process attributes and a required rating for each process attribute or select the appropriate process capability level and the required process capability level ratings.

In general, it is recommended that the sponsor selects one or more existing process reference models and uses the processes in the selected models as the basis for determining the process capability of each selected process within the models. Should additional processes need to be defined to meet business requirements, the sponsor has two options:

1) Define the process to demonstrate conformance as required in ISO 15504-2:2003, 6.2.4 in order to have a conformant target process profile, or

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2) Where the process does not meet ISO 15504-2:2003, 6.2.4 requirements, use the target process profile while noting it is nonconforming for process capability determination purposes.

As a result, a set of target process profiles will consist of a set of processes and process attribute ratings or a set of processes and process capability level ratings applicable to the intended use. A set of target process profiles cannot be generic (e.g. all processes to be capability level 2 or capability level 3) as this will not meet the specific application defined by its intended use. This form of generic profile will not address the specified business requirement, domain of application and characterization nor specifically determine the indicators of process performance and process capability that meet the intended use (see note 2).

NOTE 1 The sponsor may appoint persons or teams to perform the work in defining and using target process profiles.

NOTE 2 Software that needs to meet human safety critical business requirements (i.e. a specific domain of application) has different requirements to software used to create personal web sites. Within any domain of application, some of the selected processes will need to be at higher process capability levels in order to achieve acceptable process related risk, while the other selected processes that have less effect on the process related risk should be effective at lower process capability levels.

NOTE 3 A maturity level in an organizational maturity model may be composed from a set of target process profiles.

5.2 Defining a target process profile

5.2.1 Introduction

The ten steps associated with defining a target process profile are:

— Define the purpose

— Select the community of use

— Define the business requirement

— Define the domain of application

— Define characterization

— Define target process profile factors

— Define criteria for data and information collection

— Select processes

— Define target process profile output

— Define target capability

NOTE The process of defining a target process profile should also be shown diagrammatically.

5.2.2 Define the purpose

The sponsor selects or defines the purpose for the target process profile.

— by or on behalf of an organization with the objective of specifying a target process profile to meet specified needs;

— by or on behalf of an organization with the objective of specifying a target process profile against which to assess the actual capability of the organization to meet that target;

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— by or on behalf of an organization with the objective of specifying a target process profile against which to assess the actual capability of another organization to meet that target;

— by or on behalf of an organization with the objective of determining the need for improvement based upon any capability gap between the actual capability and the target process profile.

5.2.3 Select the community of use

The sponsor selects or defines a community of use for the target process profiles. Target process profiles should vary depending upon the community of use. Hence an industry-wide community of use should be applicable across various industry participants with different enterprise business models. An enterprise based community of use should embrace the specific enterprise business model. Similarly, a team or project oriented target process profile should embrace more specific team or project needs. The community of use may be based upon:

— a defined industry, e.g. automotive, medical devices, telecommunications, aerospace, IT services, finance, insurance;

— an enterprise level community, i.e. a specific enterprise with a specific business model, hence allowing for enterprise processes and characteristics that may drive competitive advantage in comparison to other enterprises;

— a team or project level within an enterprise with a specified set of business requirements, e.g. software project teams in a enterprise application supplier, that may allow more specific guidance for improvement of teams and projects;

— a professional or technical community of use (see note), that should allow the community to define various levels of target capability for application of its processes.

NOTE A professional or technical community may be a specific software development community, IT service management, project management community or similar body.

5.2.4 Define the business requirement

The sponsor selects or defines the business requirement so that it is clear to which business requirements the target process profiles are applicable. For example, the sponsor may define the business requirement to cover medical device software with potential human safety issues (both to patients and operators) should a medical device running the software not perform correctly. Alternately, the sponsor may define the business requirement on the basis of financial, security or other business risk based criteria.

5.2.5 Define the domain of application

The sponsor selects or defines a domain of application for the target process profiles. The domain of application should guide the creation of the target process profiles with respect to the selection of the process model and processes. It should also guide users of target process profiles to select an applicable profile for its intended purpose and relevant organization, for example a system supplier or a software supplier.

A domain of application may be broadly defined, for example for systems, software or IT services; or may be more narrowly defined, for example software for electrical control units for automotive speed control. The more narrowly defined the domain of application, the more likely will be the need to define specific processes and their capability, and hence the better the guidance and applicability to specific users of the target process profiles. On the other hand, a too narrow definition will reduce the overall applicability of the target process profiles. A broadly defined domain of application will generally apply to more users. On the other hand, a too broadly defined domain of application will result in less useful guidance and a greater potential need to adapt the profile to suit its application to specific users.

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5.2.6 Define characterization

The sponsor defines characterization or selects a characterization scheme for the domain of application. The characterization or characterization scheme should reflect the levels of process related risk or value creation that occurs in the domain of application. Hence, the characterization scheme should clearly define criteria that specify any need for multiple forms of characterization which guide determination of the number of target process profile sets required and the creation of each target process profile set.

Characterization may be based upon one or more (combination) characterization criteria. These may include, but are not limited to:

— Business or Service criticality criteria

— Safety criticality criteria

— Financial criteria

— Operational criteria

— Delivery criteria

— Quality criteria

— Mission or functional criteria

— Timeliness criteria

For example, a characterization scheme that uses safety criticality criteria should result in several safety levels, for example ranging from human safety critical through human safety important to moderate safety importance, low safety importance, or even no safety relevance.

When the process related risk varies in each specified characterization, it is highly likely that each selected process requires a different process capability commensurate to the varying process related risk. Hence each separate characterization should result in a separate target process profile. Well defined characterization will clearly guide users in selecting the correct set of target process profiles with the appropriate process attributes or capability levels to reduce the process related risk and meet the business requirement for the domain of application and community of use.

5.2.7 Define target process profile factors

The sponsor defines how to determine which processes are most likely to effectively increase success or reduce the process related risk for the intended use.

This determination should use a target process profile factor that guides data collection to identify the process aspects which reduce process related risk or increase the possibility to achieve the business requirement (see note 1). This factor also guides determination of the level of significance of each of the identified processes or practices. In order to determine the level of significance of practices and processes, the factor addresses the likelihood (*probability)* and effectiveness (*consequence*) of a practice or process to achieve the business requirement for each defined characterization in the domain of application. This factor is referred to as a *probability factor* hereafter. There are two ways for probability factors to reduce risk of failure or increase the possibility to achieve the business requirement:

— reduce the likelihood of failure, which is *risk* based (see note 2);

— increase the likelihood of achieving the business requirement, which is *value creation* based (see note 3).

The sponsor defines whether a target process profile analysis uses either or both types of probability factors.

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Alternatively, the sponsor may refer to the selected documented process that defines the types of probability factors used.

The sponsor creates a list of probability factors. This list should be as comprehensive as possible for each characterization in the domain of application of the business requirement for the community of use. As required, the outcome of this activity comprises:

— a list of risks, grouped into related risk areas, in order to be used as the basis for collecting evidence of practices that mitigate the risks to the business requirement;

— a list of value creation factors, grouped into related value creation areas, in order to be used as the basis for collecting evidence of practices that improve the possibility of achievement of the business requirement.

The sponsor ensures the list of probability factors is available to guide data collection and subsequent analysis.

The analysis of data collected using these factors relates the data and information collected for each characterization in a traceable manner to process performance indicators, process capability indicators, and hence to process attributes and ratings, and process capability levels.

NOTE 1 A target process profile is predictive in nature; it is a statement of target capability that aims to reduce process related risk and increase the possibility of achievement of the business requirement. Therefore the use of probability oriented factors is compatible with the predictive nature of a target process profile.

NOTE 2 Using risk based analysis is compatible with process assessment for Process Capability Determination (PCD) purposes. PCD assesses an organization's processes to determine their suitability for the specified requirement and identifies gaps between target and assessed capabilities that can be analysed to determine overall process related risk (ISO/IEC 15504-4:2004, 4.5). Therefore the sponsor may choose to define target process profiles solely based upon risk factors.

NOTE 3 Value creation factor analysis uses the likelihood to influence (probability) and effectiveness (consequence) to achieve the criteria. The sponsor may choose to use value creation factor analysis when specific processes are thought to positively influence achievement of the business requirement.

5.2.8 Define criteria for data and information collection

The sponsor defines criteria for collecting data and information used to define the target process profile. The criteria cover the following:

— the type of data and information collected;

— the data sample size;

— how to ensure the collected data and information is representative of the community of use;

— the relationship of the data and information to a factor that can be used to derive the target process profile;

— traceability between data and information and the target process profile results.

The criteria ensure that data and information are collected for each defined characterization in the domain of application for the defined business requirement. The criteria ensure that data and information are collected using a probability factor that relates to the processes, practices and activities which reduce the *process related risk* (as defined in ISO/IEC 15504-4:2004) and increase the *possibility* of achieving the business requirement. The data and information collected should be representative of all relevant aspects of the community of use for the defined characterization of the domain of application for the business requirement. The sponsor should define the data and information collection sample size required to ensure a significant number of data points are collected. Alternatively, the sponsor may refer to the selected documented process which defines data and information collection requirements (see notes).

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For a target process profile to be useful for its intended purpose, the community of use should have confidence in the way it has been derived. This requires traceability from the input data and information to the target process profile so that the results are reproducible. This traceability should be clearly defined. The sponsor may provide a statement covering traceability based upon the method used.

NOTE 1 If data are collected through interviewing people involved in performing selected processes, this requires interviewing a sufficient number of people to determine which practices they follow. This requires multiple data and information points to be collected for each process and practice, as well as a comprehensive set of viewpoints (i.e. all factors considered from various aspects such as project management, development, quality assurance and the customer). The number and type of people interviewed is determined based on the combined data and information for all interviews. Data and information is considered representative when it is judged to be statistically significant and allows reliable analysis using expert judgment.

NOTE 2 The data and information collected through interviews are likely to point to many processes, practices and process attributes. Subsequent analysis should determine which processes and process attributes are significant and which are not. This can be guided by appropriate choice of factors that relate the data and information to the fulfilment of the business requirement for each defined characterization of the domain of application for the business requirement.

NOTE 3 If data collection is based upon automated or semi-automated process control measurements, the number of data points are determined based upon accepted statistical process control practices.

5.2.9 Select processes

The sponsor selects a set of processes based upon the defined business requirement and the domain of application. The set of processes is reviewed and the appropriate process reference model(s) are identified; a process reference model describes a set of processes in terms of purpose and outcomes as defined in ISO/IEC 15504-2.

The sponsor should determine which process reference model(s) will best suit the intended use, following the guidance in ISO/IEC 15504-3 on the selection of suitable process reference models. The sponsor should determine which processes from the chosen process reference model(s) are needed to meet the intended use. In some cases the sponsor may select a subset of the processes from the process reference model to meet the intended use. Based on this, the sponsor will identify suitable process assessment model(s).

Where target process profiles are required for processes that are not aligned with any recognized standard, appropriate process models or processes may still be defined and used. In these cases, a process should be defined in the same way as process in a process reference model, as required by ISO/IEC 15504-2. A note should be made whether these processes are defined in a manner conforming to ISO/IEC 15504-2 with the intent to have a conformant process reference model or that these processes are not part of a conformant process assessment, but are additional information.

The sponsor documents the reasons for these choices. For the set of processes as a whole, the sponsor documents, as a minimum:

a) the statement of purpose;

b) the community of use;

c) the business requirement;

d) the domain of application;

e) the characterization of the domain of application and business requirement;

f) the process reference models used;

g) the set of processes selected from the chosen process reference model.

NOTE 1 In the ongoing development of ISO/IEC 15504, there are additional process reference models being developed. Users of this standard are advised to check with ISO for these additional models.

NOTE 2 The sponsor may select an industry based process reference model for a defined community of use. Target process profiles and a process assessment using these profiles will be conformant when used for the intended purpose.

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5.2.10 Define target process profile output

The sponsor defines the required target process profile output.

For each process in the selected set, a statement of the target process profile is provided comprising:

a) the process name and identifier;

b) the process reference model and process assessment model;

c) the process purpose;

d) traceability information from the collected data via the probability factors to the required capability level or process attributes;

e) the required process attributes and process attribute rating or process capability level and process capability level rating for each defined characterization, together with a rationale for the required capability level or process attributes (see note 1). The rationale clearly describes what practices, via the probability factors, are required for the required capability level or process attributes for each defined characterization. This rationale supports process assessment and improvement purposes;

f) the supporting processes;

g) the required additional methods or techniques that are not in the selected process reference model processes;

h) notes on applicability and use.

The target process profile should provide the following additional information to guide users:

a) a means to identify key and significant processes that affect achievement of the business requirement for each defined characterization in the domain of application (see note 2);

b) a classification showing, for the selected process, the probability factor coverage and importance for the defined characterization, and when it is a key or significant process;

c) complementary processes, methods and techniques not in the selected process that help to achieve the business requirement.

NOTE 1 The target process profile may specify a target capability to be fully or largely achieved. If specifying process attribute targets, the profile documents whether all process attributes at the target capability level are to be fully or largely achieved or whether one is to be fully achieved and the other largely achieved.

NOTE 2 A key process clearly affects the achievement of the business requirement. For risk based analysis, a key process mitigates (reduces) or removes one or more important risks, and is the only process to mitigate at least one of those risks. In addition, a key process may mitigate a large number of risks within one or more risk areas. A significant process significantly affects the achievement of the business requirement. For risk based analysis, a significant process should be one of a few processes to mitigate one or more risks but may not necessarily remove any one risk. In addition, a significant process may mitigate a significant number of risks within one risk areas.

5.2.11 Define target capability

The sponsor defines what is expected for a statement of target capability. The statement of target capability comprises the intended use, the set of target process profiles (target capability) and any additional information related to its use in accordance with clause 5.3 of ISO/IEC 15504-4:2004.

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6 Process for creating and using target process profiles

6.1 Overview

The sponsor selects or defines a documented process for creating and using target process profiles as defined in clause 5.

This should clearly describe the approach and steps followed to produce the target process profiles, so that suitably qualified persons can use the method to produce conformant target process profiles.

In addition to the matters covered in clause 5, the documented process defines the following:

— the requirements for data and information collection comprising use of statistical process data, interviews, number and type of functional areas and persons interviewed, existing data sources, required sample size, criteria for significance and traceability;

— the specification of the probability factor, covering the use of probability and consequence (see note);

— how to relate probability factors to the data and information collected for each characterization so it is traceable;

— how to collate the probability factors and data and information collected for each characterization;

— how to analyse the collated data and information via the probability factors to the processes and practices in order to determine capability levels or process attributes and rating of each process for each defined characterization in the domain of application of the business requirement;

— additional information required to support the target process profile.

NOTE There are several commonly accepted ways to specify probability factors. For risk analysis, it is common practice to specify the overall probability of occurrence and severity of consequences. It is also possible in risk analysis or value creation to specify the number of opportunities for an event to occur, the probability for each occurrence of the event, and the consequences. The documented process should define how probability and consequence are measured. This may be by using qualitative evaluation (high, medium, low) or more precise criteria: for example, % probability and consequences in actuarial terms.

6.2 Create the target process profiles

The sponsor applies the selected documented process to create the target process profiles for the intended use. In cases where the sponsor does not select the documented process, the persons or teams creating the target process profiles select a conformant documented process and agree upon its use with the sponsor.

When creating the target process profiles, the responsible persons:

a) collect the data and information that meets the guidelines of clauses 5.2.7 and 5.2.8 taking care to ensure the data is representative of all the areas in the defined community of use (see note 1);

b) ensure that sufficient data and information points are collected and all relevant probability factors, processes and practices are covered for each characterization in the domain of application of the business requirement;

c) analyse the data and information to collate probability factors related to each characterization and determine the significant probability factors (see note 2);

d) analyse the data and information to determine which business practices and processes have the highest likelihood to affect the significant probability factors for each characterization in the domain of application of the business requirement (see note 3)

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e) assemble and document, from the results of this analysis, the set of processes for which target process profiles will be created:

   1) for each process in the set, analyse the data and information, for the significant probability factors, to derive the significant indicators that in combination specify the process, process attributes and rating for each process attribute or process capability level (see note 4). Not all the generic practices and practice performance indicators may be required to achieve the desired performance. The significant practices need to be noted in the rationale so that they can guide process assessment and improvement;

   2) create a target process profile for each process with the required information;

   3) document the target process profile;

   4) repeat for each process.

f) review the target process profiles to ensure that processes that strongly interface to and rely on each other have consistent targets;

g) verify that the completed target process profiles represent an effective profile for the intended use (see note 5);

h) repeat for each characterization;

i) compile the target process profiles into a target capability statement (see note 6).

The set of target process profiles expresses the target capability which the sponsor judges to be adequate, subject to an acceptable process related risk, for meeting the intended use (see notes 4 and 6).

NOTE 1 Data and information collection should avoid introducing biases so that the subsequent analysis is representative of the community of use, and the selected characterization in the domain of application of the business requirement. For example, interviews of people involved in a software development project should cover all roles and functional areas affected, including customers, managers, support personnel and developers. Interviews should also collect data for each level of characterization as the process related risk is very likely to vary.

NOTE 2 Not all probability factors affect each level of characterization, and some probability factors will have a greater impact than other factors. The probability factor to characterization correlation should highlight which factors have significant effect upon achieving the business requirements. These are called significant probability factors. The generic practices and the process attributes are derived from the analysis of the collated process data for these significant probability factors.

NOTE 3 If the method specifies key and significant processes, they are determined during this analysis. The correlation of process and significant probability factors should highlight which processes significantly affect the achievement of the business requirements.

NOTE 4 The target process profile may specify a target capability to be fully or largely achieved. The target process profile documents whether all process attributes at the target capability level are to be fully or largely achieved or whether one process attribute is to be fully achieved and the other largely achieved. ISO/IEC 15504-2 specifies that the process attributes at capability levels lower than the target level is to be fully achieved in order to achieve a rating of largely or fully achieved at the higher level. The only exception is that a process attribute may not be required a a lower level, although this is unlikely due to the cumulative nature of the process attributes.

NOTE 5 The sponsor should determine criteria for effectiveness. These may be verified by activities such as independent review, pilot implementation and review, or acceptance by the community of use.

NOTE 6 It should not be assumed that the resultant target process profiles for a selected process reference model will be the same for different communities of use, as differing business requirements and characterization should lead to different process attribute levels for selected processes.

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6.3 Using target process profiles

6.3.1 User Guidance

The target process profile output should allow the user to:

— understand the intended use of the target process profile;

— know when to apply the entire set of target process profiles;

— know when and how to select and apply a subset of target process profiles (see note).

— select the required processes;

— select the required capability level and process capability level ratings, or process attributes and process attribute ratings, for each selected process for the required characterization in the domain of application of the business requirement to reduce the process related risks;

— understand the practices that lead to the capability level or process attributes, as described in the rationale, so that these significant practices are the focus of assessment or improvement;

NOTE A Process Capability Determination sponsor may use parts of the target process profile set tailored to the work performed by a particular supplier or internal group (i.e. a subset of target process profiles). The sponsor may use subsets for several suppliers. The subset of target process profiles for each supplier may have selected target process profiles that are specific to each supplier as well as shared target process profiles common to several suppliers.

6.3.2 Application for gap analysis

The use of target process profiles is described in ISO/IEC 15504-4:2004, Annex A provides information on how to analyse process related risk related to gaps between a target capability and the actual or assessed capability.

In general, the failure to achieve the target Process Attributes and by implication the Capability Levels affects the probability of not meeting the business requirement(s), hence it increases the probability of process related risks occurring. This failure to achieve the target Process Attributes results in a Process Attribute and Capability level gap. Similarly, a failure to achieve the target Capability Level is called the Capability Level gap. The following table summarizes the process related risks exposed by capability level gaps.

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