



Technical Specification

**ISO/IEC TS
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Information technology — Service management —

Part 15: Guidance on the application of Agile and DevOps principles in a service management system

Technologies de l'information – Gestion des services —

*Partie 15: Lignes directrices pour l'application des principes
"Agile" et "DevOp"s dans un système de gestion des services*

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 40, *IT Service Management and IT Governance*.

A list of all parts in the ISO/IEC 20000 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

Introduction

This document is intended to assist users in relating the requirements specified in ISO/IEC 20000-1:2018 to the principles and practices of two frequently used software and service development frameworks, Agile and DevOps. Organizations can refer to this guidance as a cross-reference between the frameworks to help them plan, implement and improve a service management system (SMS).

ISO/IEC 20000-1 is the International Standard for service management and specifies requirements which can be used as the basis of a conformity assessment.

ISO/IEC 20000-1 specifies an integrated process approach in which an organization establishes, implements, maintains and continually improves an SMS. The services can be delivered to internal or external customers or a combination of both. Other parts of the ISO/IEC 20000 series provide supporting guidance.

Agile is defined as a collection of frameworks and techniques focusing on collaboration, iterative and incremental development and continuous improvement.

DevOps is defined as a set of principles and practices which enable better communication and collaboration between relevant stakeholders for the purpose of specifying, developing and operating software and systems services, and continuous improvements in all aspects of the lifecycle (ISO/IEC/IEEE 32675).

Despite these definitions being focused on software development, both Agile and DevOps principles have also been used in a much broader sense, including the development and delivery of services.

The DevOps framework is based on the Agile framework, adding automation of service development and delivery to it. Many Agile concepts discussed in this document are therefore equally applicable to DevOps.

Organizations can implement and improve their SMS using the requirements specified in ISO/IEC 20000-1 and the guidance in the other parts of the ISO/IEC 20000 series. An organization can adopt Agile and DevOps practices to support the management of their services in alignment with the requirements specified in ISO/IEC 20000-1. Other frameworks and practices can also be used to support ISO/IEC 20000-1.

Within this document, [Clause 4](#) provides an overview of ISO/IEC 20000-1 and the SMS. [Clause 5](#) applies Agile principles to the SMS. [Clause 6](#) applies DevOps principles to the SMS. In [Clause 7](#), the benefits and caveats surrounding the use of Agile, DevOps or a combination of the two in the SMS are discussed. [Annex A](#) provides a correlation of ISO/IEC 20000-1 clauses to the Agile and DevOps frameworks.

Information technology — Service management —

Part 15:

Guidance on the application of Agile and DevOps principles in a service management system

1 Scope

This document provides guidance on the relationship between ISO/IEC 20000-1:2018 and two commonly used frameworks, Agile and DevOps. It can be used by any organization or person wishing to understand how Agile and DevOps can be used with ISO/IEC 20000-1, including:

- a) an organization that has demonstrated or intends to demonstrate conformity to the requirements specified in ISO/IEC 20000-1 and is seeking guidance on the use of Agile or DevOps to establish or improve the SMS and the services;
- b) an organization that already uses Agile or DevOps and is seeking guidance on how Agile or DevOps can be used to support efforts to demonstrate conformity to the requirements specified in ISO/IEC 20000-1;
- c) an assessor or auditor who wishes to understand the use of Agile or DevOps as a support for achieving the requirements specified in ISO/IEC 20000-1.

Both approaches can be used independently or together. Depending on the context, an organization can deploy Agile frameworks only, DevOps frameworks only, use both Agile and DevOps frameworks in isolation, or use an integrated workflow with combined Agile and DevOps approaches. In any of these situations, this document can be used as guidance for the integration of Agile and DevOps practices in an SMS.

The guidance in this document can assist an organization in planning and preparing for a conformity assessment against ISO/IEC 20000-1, noting that an organization can only claim conformity by fulfilling all requirements specified in ISO/IEC 20000-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 20000-1, *Information technology — Service management — Part 1: Service management system requirements*

ISO/IEC 33202:—¹⁾, *Software and systems engineering — Core Agile practices*

ISO/IEC/IEEE 32675, *Information technology — DevOps — Building reliable and secure systems including application build, package and deployment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 20000-1, ISO/IEC 33202, ISO/IEC/IEEE 32675 and the following apply.

1) Under preparation. Stage at the time of publication: ISO/IEC/FDIS 33202:2024.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

Agile

collection of frameworks and techniques focusing on collaboration, iterative and incremental development and continuous improvement

Note 1 to entry: In this context, the term "Agile" is usually capitalized.

3.2

bottom-up intelligence

use of information coming from users themselves, so they can develop better options to achieve valuable objectives

3.3

continuous everything

increasing agility throughout the service lifecycle from testing, deployment and monitoring through to integration and delivery

3.4

cradle-to-grave

activities from the beginning of the service lifecycle to its end or disposal

Note 1 to entry: This term is specifically used in this way within the context of DevOps.

3.5

cross-functional autonomous team

team that has the skills and disciplines required to achieve an established goal, such as developing, deploying or operating a service

Note 1 to entry: These teams are fully empowered and self-sufficient for the designing, building, testing, deployment and running of the service.

3.6

customer-centric

doing business and ensuring a positive customer experience at every stage of the *customer journey* (3.7)

Note 1 to entry: When a customer-centric organization makes a decision, its people thoroughly analyze its impact on the customers.

3.7

customer journey

series or sum of customer experiences when engaging with an organization, its products or services

Note 1 to entry: "Series" is based on processes; "sum" is based on results.

[SOURCE: ISO 23592:2021, 3.8]

3.8

daily stand-up

short, daily, time-limited meeting used to discuss progress, plans and any blocking issues with each member of an *Agile* (3.1) team

[SOURCE: ISO/IEC TR 24587:2021, 3.7, modified — The term "time-boxed" has been replaced by "time-limited" at the beginning of the definition, and "Agile" has been capitalized. Note 1 to entry has been removed.]

3.9

DevOps

set of principles and practices which enable better communication and collaboration between relevant stakeholders for the purpose of specifying, developing, and operating software and systems products and services, and continuous improvements in all aspects of the lifecycle

[SOURCE: ISO/IEC/IEEE 32675:2022, 3.1.1]

3.10

hypothesis

theory that something can become valuable, even though this will not be known for sure until it is verified in a real environment

3.11

left-shift

shift-left

prioritizing the involvement of relevant stakeholders in applying quality activities, security, privacy, performance, verification, and validation earlier in the lifecycle

Note 1 to entry: In this document, the expression “shift-left” is used, because it is more common in the industry.

[SOURCE: ISO/IEC/IEEE 32675:2022, 3.1.2, modified — Admitted term "shift-left" has been added. Note 1 to entry has been added.]

3.12

minimum viable service

MVS

limited service release that includes the main *hypotheses* ([3.10](#)) that demonstrate whether the main product idea makes sense to the customer

3.13

result-oriented plan

plan that focuses on outcome rather than on the process used to deliver a service

Note 1 to entry: Following a result-oriented plan gives a higher chance of being successful. It pushes the organization to take ownership and be flexible in defining priorities. Most importantly, it enables the organization to measure progress against a defined set of requirements.

3.14

retrospective

team meeting at the end of an iterative cycle or at the end of a project to reflect on what went well, what was learned, and what should be done differently next time

[SOURCE: ISO/IEC/IEEE 24765:2017, 3.3488, modified — Preferred term has been changed from "retrospective meeting" to "retrospective". "Software project" has been changed to "project" in the definition.]

3.15

self-organizing team

team using its own knowledge to determine how best to do their job

3.16

servant leader

leader focusing on providing what the team need, removing impediments to their progress and supporting their productivity

3.17

service-thinking

focusing on the end-goal or the outcome of the process or service

3.18

service backlog

list of items ordered by value of what is to be done or to be achieved

3.19

service owner

person responsible for maximizing the value that the service development team creates, including managing the *service backlog* (3.18), identifying and prioritizing improvement opportunities and supporting operations.

Note 1 to entry: Within the context of this document, this term is used specifically in reference to Agile environments. Its use can be different within other service management environments.

3.20

technical debt

deferred cost of work not done at an earlier point in the service lifecycle

[SOURCE: ISO/IEC/IEEE 24765:2017, 3.4181, modified — "product life cycle" has been replaced with "service lifecycle".]

3.21

user story

brief description of required functionality describing the stakeholder roles, goals, benefits and motivation

[SOURCE: ISO/IEC 33202:—, 3.28, modified — Note 1 to entry has been removed.]

3.22

vanity metrics

statistics that look spectacular on the surface but do not necessarily translate to any meaningful business results

4 Introduction to ISO/IEC 20000-1:2018

ISO/IEC 20000-1 specifies requirements for establishing, implementing, maintaining and continually improving a service management system (SMS). An SMS supports the management of the service lifecycle, including the planning, design, transition, delivery and improvement of services, which meet agreed requirements and deliver value for customers, users and the organization delivering the services. The organization in the scope of the SMS can be a whole or part of a larger organization and can also be known as the "service provider".

ISO/IEC 20000-1 is intentionally independent of specific guidance. The organization can use a combination of generally accepted frameworks (e.g. Agile, DevOps) and its own experience. Appropriate tools for service management can be used to support the SMS.

All requirements specified in ISO/IEC 20000-1 are generic and are intended to be applicable to all organizations, regardless of the organization's type or size, or the nature of the services delivered. While ISO/IEC 20000-1 can be used regardless of the organization's type or size, or the nature of the services delivered, the document has its roots in IT. It is intended for service management of services using technology and digital information. The examples given in this document illustrate a variety of uses of ISO/IEC 20000-1.

Exclusion of any of the requirements in ISO/IEC 20000-1:2018, Clauses 4 to 10, is not acceptable when the organization claims conformity to ISO/IEC 20000-1, irrespective of the nature of the organization.

The organization cannot demonstrate conformity to the requirements specified in ISO/IEC 20000-1 if other parties are used to provide or operate all services, service components or processes within the scope of the SMS.

ISO/IEC 20000-10 includes the concepts for an SMS, the vocabulary used for the ISO/IEC 20000 series, a description of each part of the series and related standards.

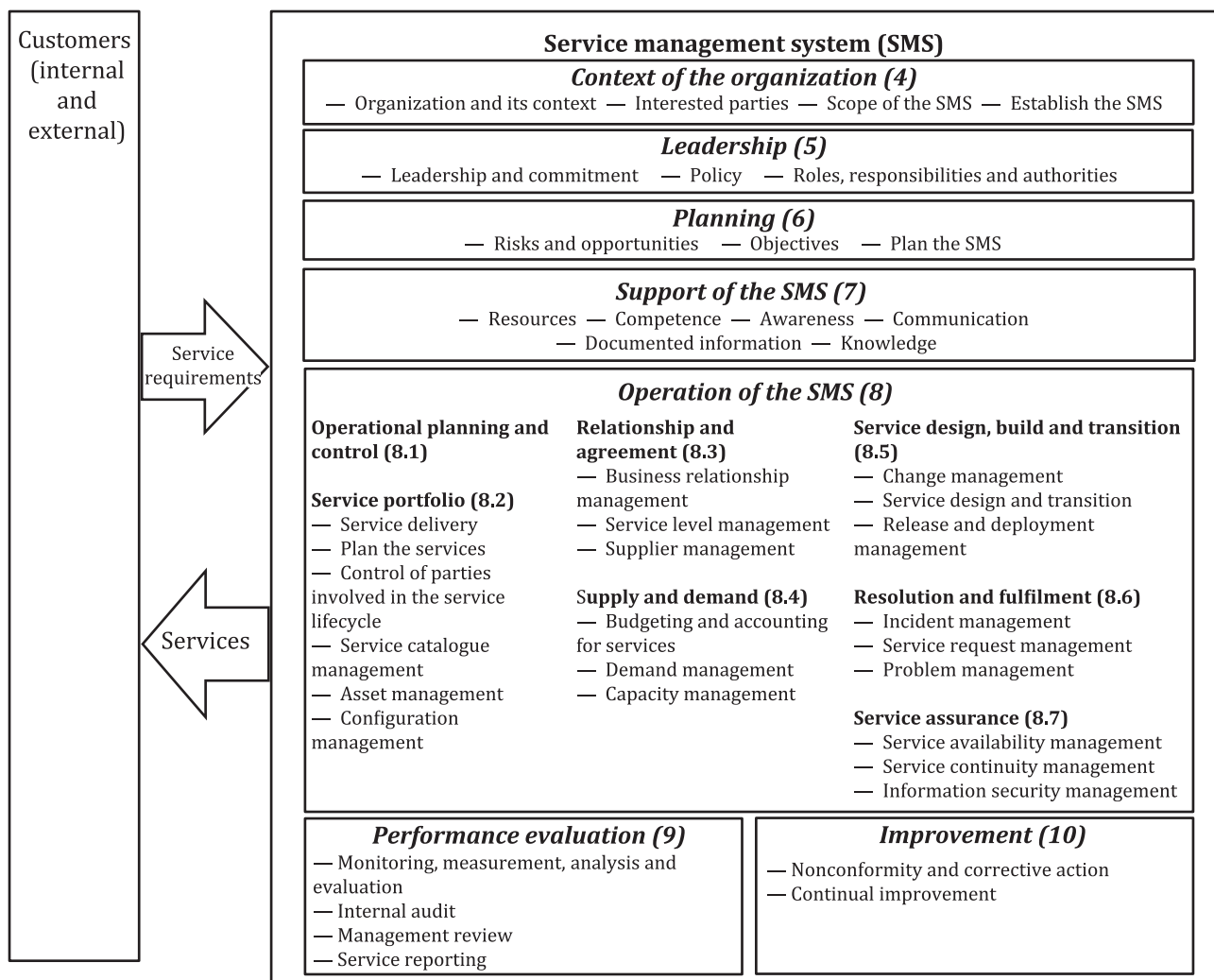
Guidance is available in other parts of the ISO/IEC 20000 series in the form of:

— ISO/IEC 20000-2, *Guidance on the application of service management systems*;

ISO/IEC TS 20000-15:2024(en)

- ISO/IEC 20000-3, *Guidance on scope definition and applicability of ISO/IEC 20000-1*;
- ISO/IEC TS 20000-5, *Implementation guidance for ISO/IEC 20000-1*;
- ISO/IEC 20000-6, *Requirements for bodies providing audit and certification of service management systems*;
- ISO/IEC TS 20000-11, *Guidance on the relationship between ISO/IEC 20000-1 and service management frameworks: ITIL®*;
- ISO/IEC TS 20000-14, *Guidance on the application of Service Integration and Management to ISO/IEC 20000-1*;
- ISO/IEC TS 20000-16:—²⁾, *Guidance on sustainability within a service management system based on ISO/IEC 20000-1*;
- ISO/IEC TR 20000-17:—³⁾, *Scenarios for the practical application of ISO/IEC 20000-1*.

[Figure 1](#) illustrates an SMS showing the clause content of ISO/IEC 20000-1.



NOTE Numbers in parentheses indicate ISO/IEC 20000-1 clause numbers.

Figure 1 — Service management system

2) Under preparation. Stage at the time of development: ISO/IEC WD TS 20000-16:2024.

3) Under preparation. Stage at the time of development: ISO/IEC CD TR 20000-17:2024.

5 Agile within an SMS based on ISO/IEC 20000-1

5.1 Background of Agile

To understand how Agile can help in service management, it is necessary to understand why Agile arose and the problem it was aiming to solve.

In its initial conception, Agile emerged to respond to a common problem identified in software development. In essence, it provided some guiding principles for answering the following question:

— How can one deliver valuable software to a customer when not even the customer is sure about what they want?

In other words, Agile focuses on customer satisfaction above all else, but in an unpredictable environment, also known as a high-uncertainty environment or a complex system. Value, the customer and uncertainty are the key points from which all Agile philosophical principles stem. These principles are summarized in the Agile Manifesto^[13] (see 5.2), and they are the source of inspiration for all Agile frameworks that exist today.

From the key points of the Agile Manifesto, a series of Agile Principles are derived (see 5.2).

Although Agile emerged to respond to a common problem that exists in software development, its benefits have extended far beyond this discipline, and it has been tested in different sectors and contexts, some of them far removed from the world of software, such as education or health.

In the following subclauses, several Agile concepts will be discussed and applied to the requirements of ISO/IEC 20000-1.

5.2 Agile Principles

5.2.1 Overview

The Agile mindset has been expressed in terms of the Agile Manifesto and its related Principles (see Reference [13]). This subclause contains a summary of the Agile Manifesto and the Agile Principles. The Agile Manifesto and Agile Principles were written with software development in mind, but they can be interpreted for the context of services.

NOTE In the following subclauses, the term "software" as used in Reference [13] has been replaced with the term "service".

5.2.2 Agile Manifesto

The focus of Agile is to uncover better ways of delivering services by providing those services and helping others also to provide services. This work has led to the valuation of:

- individuals and interactions over processes and tools;
- working services over comprehensive documentation;
- customer collaboration over contract negotiation;
- responding to change over following a plan.

Within this list, whilst the primary points (first element in each line) are considered the most important, the secondary elements (second element in each line) are also considered valuable.

NOTE See Reference [13] for further details and original text.

5.2.3 List of Agile Principles

The twelve Agile Principles are listed as follows:^[13]

- 1) "Our highest priority is to satisfy the customer through early and continuous delivery of valuable services."
- 2) "Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage."
- 3) "Deliver working service enhancements frequently, from a couple of weeks to a couple of months, with a preference for the shorter timescale."
- 4) "Business people and the service provider must work together daily throughout the service lifecycle."
- 5) "Build services around motivated individuals. Give them the environment and support they need, and trust them to get the job done."
- 6) "The most efficient and effective method of conveying information to and within service teams is face-to-face conversation."
- 7) "Working services are the primary measure of progress."
- 8) "Agile processes promote sustainable development. The sponsors, developers and users should be able to maintain a constant pace indefinitely."
- 9) "Continuous attention to technical excellence and good design enhances agility."
- 10) "Simplicity (the art of maximizing the amount of work not done) is essential."
- 11) "The best architectures, requirements and designs emerge from self-organizing teams."
- 12) "At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behaviour accordingly."

Agile principles and practices have been used successfully in areas such as product development, service development and other disciplines in a fast-moving, complex environment. In such a context, there is a significant level of uncertainty in the scope of the project. To manage this uncertainty, Agile focuses on the rapid release of a partial, but functional service, which is built upon in subsequent iterations until completion. The customer is continually involved in the development to test and verify the desired functionality. After each release, the work methodology and resulting functionality is evaluated and, if needed, improved. The overall focus of an Agile approach is on the iterative and incremental creation of value for the organization and for the customer through development of the service. This approach has led to the development of a number of Agile frameworks [such as Scrum, Scaled Agile Framework (SAFe) and dynamic systems development method (DSDM)], which all have commonalities that are described and can be applied to the SMS in the following subclauses.

5.3 Agile and services

5.3.1 Value in a service environment

Within the services domain, there is an interest in maximizing the value that the service delivers to the customer in environments of high uncertainty. The concepts of value, customer and uncertainty should encourage reflection on how to approach the design, implementation and maintenance of the SMS and the services.

The same issues that brought about the rise of Agile in software development can also be relevant to services, for example:

- how to offer a valuable service to a customer without knowing if the service will help to best meet the customer's objectives;