IEC SRD 63459

Edition 1.0 2026-06

SYSTEMS REFERENCE DELIVERABLE

Template for smart manufacturing use cases

ICS 25.040.01

ISBN 978-2-8327-1332-7

IEC SRD 63459:2026-06(en)

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

Template for smart manufacturing use cases

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC SRD 63459 has been prepared by IEC systems committee SyC SM: Smart Manufacturing. It is Systems Reference Deliverable.

The text of this Systems Reference Deliverable is based on the following documents:

Draft	Report on voting
SyCSM/127/DTS	SyCSM/136/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Systems Reference Deliverable is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

The collection, storage and distribution of use cases are intended to show the characteristics of smart manufacturing (SM), including but not limited to the following:

– vertical integration of networked manufacturing systems within enterprises;
– horizontal integration crossing enterprises;
– end-to-end integration of the whole value chain;
– short time-to-market of the new product;
– enhanced engineering and operational efficiency;
– openness for integration;
– self-optimization;
– new business model;
– resource optimization and cost savings;
– flexibility in production;
– sustainability.

In addition, managing a collection of use cases has the following goals:

– to organize use cases according to different aspects such as life cycle, hierarchy;
– to make access to a required use case easy;
– to assist in deepening the understanding of the use cases.

Use cases in SM are developed by many organizations, such as standardization bodies and consortia. With the wide spread of manufacturing Internet of Things (IoT), it is expected that many use cases will continue to be created.

The benefits from use case collection include the following aspects from different perspectives:

– to show how SM related technologies can be used to express business needs and to capture user requirements;
– to derive standardization requirements and improve the capability to use standards;
– to gather experts who are interested in SM;
– to support and promote SyC SM work;
– to help people to understand standards by related use cases.

The benefits for users of identified or analysed use case collections include the following:

– to easily access target use cases using keys corresponding to user concerns or interests;
– to effectively develop the application with use cases;
– establishment of a fundamental platform (repository) for expanding the usage of SM use cases.

In addition, the benefits for IEC itself are as follows:

– to draw attention to the usage of use cases related to SM;
– to provide the potential data query service.

The initial task of the previous SyC SM AHG 2 was the identification of SM use cases which were already available in the IEC and ISO technical work.

It is difficult to compare or contrast catalogues of use cases from different standards development organizations (SDOs) since they are developed from separate sources with different templates for different purposes. It will be useful if they can be tied to a unified framework within the SM landscape.

Therefore, to facilitate the collection of smart manufacturing use cases, SyC SM WG 1 was set up as a subsequent group carrying over the outcomes from the SyC SM AHG 2. It was requested to collaborate with TCs and SCs, ISO/SMCC, other SDOs and external organizations.

The SM use case template is based on SM reference architecture (refer IEC 63339:2024), taxonomy (refer ISO/IEC TR 63306-1:2020), terminology (refer IEC TR 63283-1:2022), and current use cases. The development of the SM use case template follows the V-model shown in Figure 1. The SM use case template is analysed and designed based on the requirement from SDG users, IEC SyC SM WG 3, industry users, etc. Then, it will be verified by WG 1 using use case data, and validated by related SDOs and industry users.

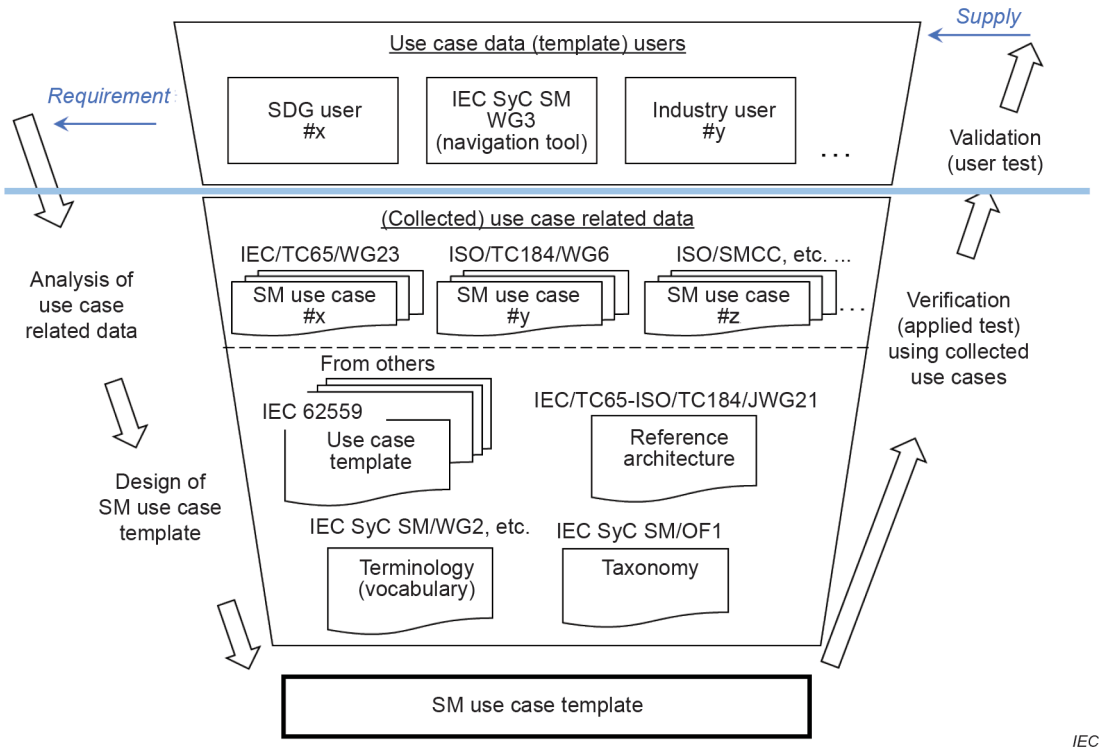

Figure 1 – Development process of SM use case template

It is important to encourage SDOs and industry users to compile the SM use case based on the SM use case template described in 7.1. A guideline for drafting the use cases is provided in 7.2. Use cases from various sources will be brought into the proposed use case management repository (UCMR) for ease of access and reference by standards developers, and industry users of SyC SM applications, shown in Figure 2.

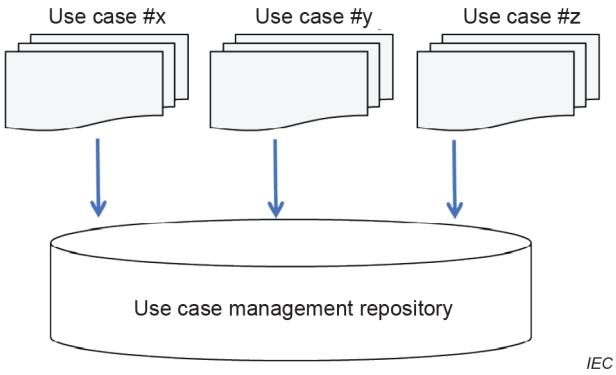

Figure 2 – Use of UCMR

IEC Guide 125 on application of the use case (UC) methodology is under development. It is based on IEC 62559-2, which gives an overview of the individual parts of the IEC 62559 series, provides the background and basics for the use case approach defined therein (like terms or use case types), and introduces processes for collaborative use case collection within IEC. IEC Guide 125 will be the basis for a common use case repository, used to gather use cases within IEC on a common collaborative platform. The SM use case template has the same structuring methodology as IEC Guide 125 and it can be one of the profiles for different domains.

1 Scope

This document specifies the template for smart manufacturing use cases. It is developed for easier storage, search, comparison, and retrieval of use cases from different SDOs and others by having a unified template of use cases.

The storage of SM use cases in IEC UCMR follows the template requirements in this document.

2 Normative references

There are no normative references in this document.

Bibliography

IEC Guide 125, *Use case methodology*[1]

ISO/IEC 19505-2:2012, *Information technology - Object Management Group Unified Modeling Language (OMG UML) - Part 2: Superstructure*

ISO/IEC TR 24030:2024, *Information technology - Artificial intelligence (AI) - Use cases*

IEC 62559-2:2015, *Use case methodology - Part 2: Definition of the templates for use cases, actor list and requirements list*

IEC TS 63134:2020, *Active assisted living (AAL) use cases*

IEC TR 63283-1:2022, *Industrial-process measurement, control and automation - Smart manufacturing - Part 1: Terms and definitions*

IEC TR 63283-2:2022, *Industrial-process measurement, control and automation - Smart manufacturing - Part 2: Use cases*

ISO/IEC TR 63306-1:2020, *Smart manufacturing standards map (SM2) - Part 1: Framework*

IEC 63339:2024, *Unified reference model for smart manufacturing*

IEC PAS 63088:2017, *Smart manufacturing - Reference architecture model industry 4.0 (RAMI4.0)*[2]

CEN/CENELEC/ETSI, *Smart Grid Coordination Group - Working Group Sustainable Processes: Report SGCG/M490/E:2012-12 Use Case Collection*, Management, Repository, Analysis and Harmonization

_____

1 Under development.

2 Withdrawn.