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Industrial-process measurement, control and automation - Smart manufacturing - Part 2: Use cases

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Industrial-process measurement, control and automation - Smart manufacturing - Part 2: Use cases

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This first edition cancels and replaces the first edition of IEC TR 63283-2 published in 2022. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) additional use cases (Clause 6);
b) clustering of the requirements for standardization (Clause 7);
c) consolidation of the use cases contributing to the cluster “Computing infrastructure” (Clause 8 and Annex D);
d) consolidation of the business context of the use cases (Annex C).

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
65/1158/DTS	65/1179/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 Technical Specification 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.

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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

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– revised.

INTRODUCTION

In recent years, one observes that an increasing number of “buzzwords” are in discussion in the manufacturing area. The scope of the various “buzzwords” is not clearly defined; moreover, the scope addressed by the “buzzwords” is not congruent but overlapping. Each stakeholder involved in these discussions has another perspective to the various topics and the discussions address very different levels of detail and consider different contexts. This is illustrated in Figure 1.

Smart manufacturing is one of the buzzwords that addresses multiple stakeholders. The overall community is convinced that smart manufacturing will significantly affect the manufacturing industries and, therefore, standardization will consolidate the vision of smart manufacturing from different manufacturing industries viewpoints. The discussions within standardization are sufficiently formal or precise in order to later have any claim regarding compliance to standards. Thus, standardization will consolidate the definitions and understanding of the “buzzwords” for its own usage.

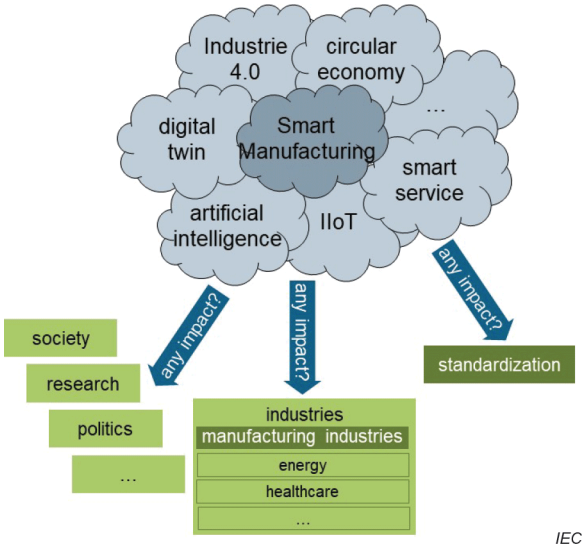


Figure 1 – Related subjects to smart manufacturing

In order to analyze the impact of smart manufacturing on standardization, the approach chosen is the collection and evaluation of use cases to obtain a sufficiently representative description of smart manufacturing. These use cases are described from the perspective of the manufacturing value chains. They illustrate what can be conceivable in the future in the context of smart manufacturing. Thus, a use case itself is explainable[1] to a manufacturing company. Experts in standardization will afterwards analyze these use cases to decide whether

– a specific use case provides no (new) input for standardization,
– a specific use case provides needs to maintain existing standards (this can be related to the content or the application areas), and
– a specific use case provides input for additional measures to be elaborated in by standardization projects.

[1] A typical employee of a manufacturing company is not familiar with formal methods used to describe use cases as accurately as possible or even uses different terms, for example "plant" versus "factory" versus "production system". Thus, an explanation of the use cases is necessary.

Based on this approach, the use cases will contribute to the following topics.

– Consolidation of the vision of smart manufacturing: The use cases will describe the basic principles of traditional and future manufacturing value chains and will work out the additional, new opportunities enabled by digitalization.
– Consolidation of terms and concepts: The use cases will facilitate to come to agreements on basic terms and concepts. The description of terms and concepts will be in an application context and not here in a terms and definitions section.
– Justification of a general need for standardization: Based on the use cases, the fundamental gaps will be identified. It is intended to close the gaps that have not yet been filled up. Possibly, however, it is effective to first suitably upgrade the installed base based on already established standards.
– Elaboration of recommendations for standardization on an abstract level: Based on the use cases, the requirements – and not solution concepts – for standardization will be extracted to achieve a consensus for maintenance or new development of standards. It is intended to derive the recommendations from the use cases and ensure backward traceability to the use cases.

1 Scope

This document has the goal of analyzing the impact of smart manufacturing on the daily operation of an industrial facility. It focusses on the perspective of automation and control of the production system, but also on the supporting processes of ordering, supply chain management, design, engineering and commissioning, operational technology, life cycle management, maintenance management, and resource management.

These recommendations are accomplished on the basis of several carefully selected use cases that are familiar to manufacturing industry. Therefore, each use case is described, followed by an analysis of the possible influence of smart manufacturing and the assessment of the impact on existing and future standardization.

2 Normative references

There are no normative references in this document.

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