



BSI Standards Publication

# Industrial-process measurement, control and automation — Smart manufacturing

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Part 2: Use cases

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The UK participation in its preparation was entrusted to Technical Committee GEL/65, Measurement and control.

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Published by BSI Standards Limited 2022

ISBN 978 0 539 126 3 5

ICS 25.040

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 May 2022.

### Amendments/corrigenda issued since publication

Date	Text affected
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# IEC TR 63283-2

Edition 1.0 2022-03

## TECHNICAL REPORT



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

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# IEC TR 63283-2

Edition 1.0 2022-03

## TECHNICAL REPORT



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

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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ICS 25.040.40

ISBN 978-2-8322-1085-9

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## CONTENTS

FOREWORD.....	7
INTRODUCTION.....	9
1 Scope.....	11
2 Normative references .....	11
3 Terms and definitions .....	11
3.1 General.....	11
3.2 General terms and definitions .....	11
3.3 Business roles .....	13
3.4 Human roles .....	14
3.5 Technical roles acting as object only.....	16
3.6 Technical roles acting as subject or object.....	18
4 Abbreviated terms and acronyms.....	21
5 Conventions .....	22
5.1 General.....	22
5.2 Description of use cases .....	22
5.3 Selection guidance for elaborated use cases .....	23
5.4 Reference frame for use cases .....	23
5.5 Clustering of use cases.....	24
5.6 Developing additional use cases .....	25
6 Use cases .....	25
6.1 Use case cluster “Order-controlled production”.....	25
6.1.1 Manufacturing of individualized products .....	25
6.1.2 Flexible scheduling and resource allocation.....	29
6.1.3 Outsourcing of production.....	32
6.1.4 Engineering of design for manufacturing and request/order management.....	35
6.1.5 Intra-facility logistics .....	38
6.1.6 Decision support for product configuration .....	40
6.2 Use case cluster “Adaptable factory”.....	42
6.2.1 Modularization of production systems .....	42
6.2.2 Reconfiguration of adaptable production systems .....	46
6.2.3 Migration to adaptable production systems .....	48
6.2.4 Standardization of production technologies.....	51
6.2.5 Adaptable robot cells .....	54
6.3 Use case cluster “Management of assets”.....	57
6.3.1 Administration of assets.....	57
6.3.2 Virtual representation of physical assets.....	60
6.3.3 Feedback loops .....	63
6.3.4 Update and functional scalability of production resources.....	66
6.3.5 Condition monitoring of production resources .....	68
6.3.6 Self-optimization of production resources .....	71
6.4 Use case cluster “Optimization of production execution” .....	73
6.4.1 Optimization of operations .....	73
6.4.2 Simulation in operation .....	76
6.4.3 Optimization of operation through machine learning.....	78
6.4.4 Service workflow management for production systems .....	81

6.4.5	Successive improvement of production systems .....	84
6.5	Use case cluster “Energy efficiency” .....	87
6.5.1	Design for energy efficiency .....	87
6.5.2	Optimization of energy .....	89
6.5.3	Design for participation in decentralized energy networks .....	92
6.5.4	Participation in decentralized energy networks .....	94
6.6	Use case cluster “Design and engineering” .....	96
6.6.1	Seamless models .....	96
6.6.2	Simulation in design and engineering .....	99
6.6.3	Virtual commissioning of production systems .....	103
6.6.4	Optimization in design and engineering through machine learning .....	106
6.6.5	Immersive training of production system personnel .....	108
6.6.6	Co-creation in design .....	111
6.7	Use case cluster “Product and production services” .....	114
6.7.1	Value-based services for production resources .....	114
6.7.2	Benchmarking of production resources .....	118
6.7.3	Production resource as-a-service .....	120
6.8	Use case cluster “IT-infrastructure and software” .....	123
6.8.1	Device configuration .....	123
6.8.2	Information extraction from production system .....	126
6.8.3	Rule-driven software applications .....	128
6.8.4	Integration of engineering-tools .....	131
6.8.5	Human-machine interface .....	134
6.8.6	Cyber security infrastructure and setup .....	137
6.8.7	Cyber security management and maintenance .....	141
6.8.8	Engineering for cyber security .....	144
6.8.9	Support for tactical and strategic decision making .....	146
6.8.10	Additive manufacturing .....	149
Annex A (informative)	Use case template .....	153
Annex B (informative)	General understanding of use cases .....	154
Annex C (informative)	Relation to use cases in the draft elaboration .....	156
Annex D (informative)	Additional draft use cases .....	158
D.1	General .....	158
D.2	Inter-facility logistics .....	158
D.2.1	Objective .....	158
D.2.2	Overview .....	158
D.2.3	Business context .....	159
D.2.4	Technical perspective .....	159
D.2.5	Interaction of roles .....	159
D.2.6	Expected change and impact .....	159
D.2.7	Recommendations for standardization .....	159
D.3	Safety setup and management .....	160
Bibliography	.....	161
Figure 1	– Related subjects to Smart Manufacturing .....	9
Figure 2	– Overall structure of use cases .....	22
Figure 3	– Value added processes within a manufacturing company .....	23
Figure 4	– Example for value added processes across different companies .....	24

Figure 5 – Illustration of the use case cluster	25
Figure 6 – Business context of “Manufacturing of individualized products”	26
Figure 7 – Technical perspective of “Manufacturing of individualized products”	27
Figure 8 – Business context of “Flexible scheduling and resource allocation”	30
Figure 9 – Technical perspective of “Flexible scheduling and resource allocation”	30
Figure 10 – Business context of “Outsourcing of production”	32
Figure 11 – Technical perspective of “Outsourcing of production”	33
Figure 12 – Business context of “Engineering of design for manufacturing and request/order management”	36
Figure 13 – Technical perspective of “Engineering of design for manufacturing and request/order management”	36
Figure 14 – Business context of “Intra-facility logistics”	39
Figure 15 – Technical perspective of “Intra-facility logistics”	39
Figure 16 – Business context of “Decision support for product configuration”	41
Figure 17 – Technical perspective of “Decision support for product configuration”	41
Figure 18 – Business context of “Modularization of production systems”	43
Figure 19 – Technical perspective of “Modularization of production systems”	43
Figure 20 – Business context of “Reconfiguration of adaptable production systems”	47
Figure 21 – Technical perspective of “Reconfiguration of adaptable production systems”	47
Figure 22 – Business context of “Migration to adaptable production systems”	49
Figure 23 – Technical perspective of “Migration to adaptable production systems”	50
Figure 24 – Business context of “Standardization of production technologies”	52
Figure 25 – Technical perspective of “Standardization of production technologies”	52
Figure 26 – Business context of “Adaptable robot cells”	55
Figure 27 – Technical perspective of “Adaptable robot cells”	56
Figure 28 – Business context of “Administration of assets”	58
Figure 29 – Technical perspective of “Administration of assets”	58
Figure 30 – Business context of “Virtual representation of physical assets”	61
Figure 31 – Technical perspective of “Virtual representation of physical assets”	62
Figure 32 – Business context of “Feedback loops”	64
Figure 33 – Technical perspective of “Feedback loops”	65
Figure 34 – Business context of “Update and functional scalability of production resources”	67
Figure 35 – Technical perspective of “Update and functional scalability of production resources”	67
Figure 36 – Business context of “Condition monitoring of production resources”	69
Figure 37 – Technical perspective of “Condition monitoring of production resources”	70
Figure 38 – Business context of “Self-optimization of production resources”	72
Figure 39 – Technical perspective of “Self-optimization of production resources”	72
Figure 40 – Business context of “Optimization of operations”	74
Figure 41 – Technical perspective of “Optimization of operations”	75
Figure 42 – Business context of “Simulation in operation”	77
Figure 43 – Technical perspective of “Simulation in operation”	77
Figure 44 – Business context of “Optimization of operation through machine learning”	79

Figure 45 – Technical perspective of “Optimization of operation through machine learning” .....	80
Figure 46 – Business context of “Service workflow management for production systems” .....	82
Figure 47 – Technical perspective of “Service workflow management for production systems” .....	83
Figure 48 – Business context of “Successive improvement of production systems” .....	85
Figure 49 – Technical perspective of “Successive improvement of production systems” .....	85
Figure 50 – Business context of “Design for energy efficiency” .....	88
Figure 51 – Technical perspective of “Design for energy efficiency” .....	88
Figure 52 – Business context of “Optimization of energy” .....	90
Figure 53 – Technical perspective of “Optimization of energy” .....	91
Figure 54 – Business context of “Design for participation in decentralized energy networks” .....	93
Figure 55 – Technical perspective of “Design for participation in decentralized energy networks” .....	93
Figure 56 – Business context of “Participation in decentralized energy networks” .....	95
Figure 57 – Technical perspective of “Participation in decentralized energy networks” .....	95
Figure 58 – Business context of “Seamless models” .....	97
Figure 59 – Technical perspective of “Seamless models” .....	98
Figure 60 – Business context of “Simulation in design and engineering” .....	101
Figure 61 – Technical perspective of “Simulation in design and engineering” .....	102
Figure 62 – Business context of “Virtual commissioning of production systems” .....	104
Figure 63 – Technical perspective of “Virtual commissioning of production systems” .....	105
Figure 64 – Business context of “Optimization in design and engineering through machine learning” .....	107
Figure 65 – Technical perspective of “Optimization in design and engineering through machine learning” .....	107
Figure 66 – Business context of “Immersive training of production system personnel” .....	109
Figure 67 – Technical perspective of “Immersive training of production system personnel” .....	110
Figure 68 – Business context of “Co-creation in design” .....	112
Figure 69 – Technical perspective of “Co-creation in design” .....	113
Figure 70 – Business context of “Value-based services for production resources” .....	116
Figure 71 – Technical perspective of “Value-based services for production resources” .....	116
Figure 72 – Business context of “Benchmarking of production resources” .....	119
Figure 73 – Technical perspective of “Benchmarking of production resources” .....	119
Figure 74 – Business context of “Production resource as-a-service” .....	121
Figure 75 – Technical perspective of “Production resource as-a-service” .....	122
Figure 76 – Business context of “Device configuration” .....	124
Figure 77 – Technical perspective of “Device configuration” .....	124
Figure 78 – Business context of “Information extraction from production systems” .....	127
Figure 79 – Technical perspective of “Information extraction from production systems” .....	127
Figure 80 – Business context of “Rule-driven software applications” .....	130
Figure 81 – Technical perspective of “Rule-driven software applications” .....	130
Figure 82 – Business context of “Integration of engineering-tools” .....	132

Figure 83 – Technical perspective of “Integration of engineering-tools” .....	133
Figure 84 – Business context of “Human-machine interface” .....	136
Figure 85 – Technical perspective of “Human-machine interface” .....	136
Figure 86 – Business context of “Cyber security infrastructure and setup” .....	138
Figure 87 – Technical perspective of “Cyber security infrastructure and setup” .....	139
Figure 88 – Business context of “Cyber security management and maintenance” .....	142
Figure 89 – Technical perspective of “Cyber security management and maintenance” .....	142
Figure 90 – Business context of “Engineering for cyber security” .....	145
Figure 91 – Technical perspective of “Engineering for cyber security” .....	145
Figure 92 – Business context of “Support for tactical and strategic decision making” .....	147
Figure 93 – Technical perspective of “Support for tactical and strategic decision making” .....	147
Figure 94 – Business context of “Additive manufacturing” .....	150
Figure 95 – Technical perspective of “Additive manufacturing” .....	151
Figure B.1 – Classification of use cases in terms of IIRA .....	155
Figure B.2 – Relation between selected templates for use cases .....	155
Figure D.1 – Business context of “Inter-facility logistics” .....	159
Table 1 – Abbreviated terms and acronyms .....	21
Table C.1 – Use cases in the draft elaboration .....	156

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

Draft	Report on voting
65/864/DTR	65/905/RVDTR

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 Report is English.

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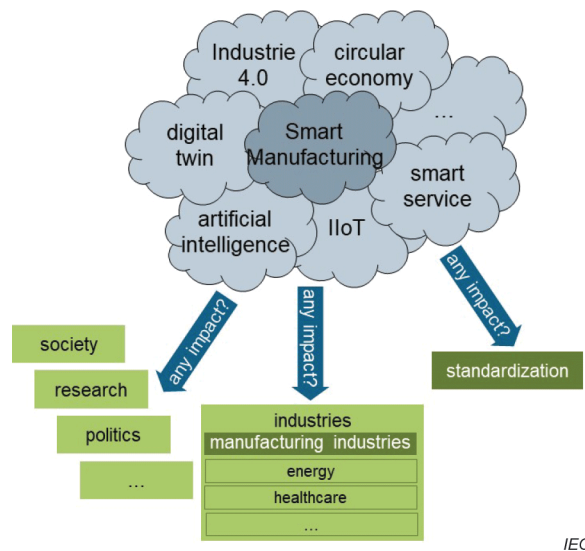
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## INTRODUCTION

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 sectors 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 could be conceivable in the future in the context of “Smart Manufacturing”. Thus, a use case itself is explainable<sup>1</sup> 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);
- a specific use case provides input for additional measures to be elaborated in by standardization projects.

<sup>1</sup> 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 “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.

# INDUSTRIAL-PROCESS MEASUREMENT, CONTROL AND AUTOMATION – SMART MANUFACTURING –

## Part 2: Use cases

### 1 Scope

This Technical Report 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, 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.

### 3 Terms and definitions

#### 3.1 General

For the purposes of this document, the following terms and definitions apply.

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

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

NOTE In 3.2, all conceptual constituents of uses cases including their context are defined in a way that the document is self-explanatory. The definitions are fully aligned with IEC TR 63283-1 (65/683/DTR).

From these conceptual constituents the examples introduced in the various use cases are distinguished. These concrete roles are consolidated in 3.3, 3.4, 3.5 and 3.6 to provide a consistent cross reference of all concrete roles involved in the individual use cases of this document. For the sake of clarity, a distinction is made between business, human and technical roles. A technical role can be represented by a subject or an object, where a subject is an entity doing something, and an object is having something done to it. Thus, subjects have capabilities in the sense of having the ability to perform actions.

#### 3.2 General terms and definitions

##### 3.2.1

##### **actor**

entity that communicates and interacts

Note 1 to entry: These actors can include people, software applications, systems, databases, and even the power system itself.

[SOURCE: IEC 62559-2: 2015, 3.2]