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TECHNICAL REPORT

Internet of things (IoT) and digital twin – Best practices for use case projects



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CONTENTS

FOREWORD 4
INTRODUCTION 5
1 Scope 6
2 Normative references 6
3 Terms and definitions 6
4 Abbreviated terms 7
5 Use cases 7
5.1 General 7
5.2 Conceptual model of a use case 8
6 Use case projects 9
6.1 Purpose 9
6.2 Examples of use case projects 9
6.2.1 Study project 9
6.2.2 Guidance project 9
6.2.3 Business project 10
6.2.4 Business expectation project 10
6.2.5 System project 11
7 Use case templates 12
7.1 Purpose 12
7.2 Conceptual model of use case template 12
7.3 Template description 13
7.3.1 Overall structure 13
7.3.2 Description blocks 14
7.3.3 Predefined fields 15
7.3.4 Instructions 16
7.3.5 Samples 16
8 Use case project plans 19
8.1 Purpose 19
8.2 Use case initiative governance process 20
8.3 Template development process 20
8.4 Template maintenance process 21
8.5 Use case development process 22
8.6 Use case maintenance process 22
Annex A (informative) Examples of use case projects 24
A.1 Overview 24
A.2 IoT 25
A.3 Digital twins 26
A.4 Artificial intelligence 28
A.5 Privacy of consumer goods and services 29
Bibliography 31

Figure 1 – Conceptual model of use case 8
Figure 2 – Purpose of study use case 9
Figure 3 – Purpose of guidance use case 10
Figure 4 – Purpose of business case 10

Figure 5 – Purpose of expectation use case 11
Figure 6 – Purpose of system use case 11
Figure 7 – Conceptual model of system use case 12
Figure 8 – Conceptual model of a use case template 13
Figure 9 – Structure of use case template 14
Figure 10 – Description block example 14
Figure 11 – Categorized description block example 15
Figure 12 – Structure of a sample 17
Figure A.1 – Rationale for a repository of use cases 24

Table 1 – Examples of definitions of the concept of use case in standards 8
Table 2 – Examples of vocabulary 13
Table 3 – Examples of predefined fields 16
Table 4 – Examples of instructions 16
Table 5 – Examples of free text 17
Table 6 – Examples of well-formed sentences 18
Table 7 – Example of machine-readable diagram 19
Table 8 – Use case initiative governance process 20
Table 9 – Template development process 21
Table 10 – Template maintenance process 22
Table 11 – Use case development process 22
Table 12 – Use case maintenance process 23

INTERNET OF THINGS (IoT) AND DIGITAL TWIN – BEST PRACTICES FOR USE CASE PROJECTS

FOREWORD

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ISO/IEC TR 30194 has been prepared by subcommittee 41: Internet of Things and Digital Twin, of ISO/IEC joint technical committee 1: Information technology. It is a Technical Report.

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

Draft	Report on voting
JTC1-SC41/457/DTR	JTC1-SC41/465/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.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1, and the ISO/IEC Directives, JTC 1 Supplement available at www.iec.ch/members_experts/refdocs and www.iso.org/directives.

INTRODUCTION

The concept of use cases was introduced in the 1980s in system engineering by Ivar Jacobson [1][1] to enable the capture and specification of the requirements of a system, using textual, structural, and visual modelling techniques. The practice of providing use cases has been widely used at research level [2]. It has been nearly systematically used at standardization level as shown in the following examples:

– methodology for use cases from IEC 62559 [3], [4], [5];
– use cases in the ambient assisted living (AAL) domain [6];
– use cases in the big data domain [7], including three iterations from NIST [8], [9], [10];
– use cases in the IoT domain [11];
– use cases in the AI domain [12], including a companion standard on security and privacy [13];
– use cases in the digital twin domain [14];
– use cases in the blockchain domain [15];
– use cases on privacy-by-design in the consumer domain [16];

This document describes best practices for use case projects. It is structured as follows:

– Clause 5 provides an introduction on existing definitions (5.1), and specifies a conceptual model of use cases.
– Clause 6 explains the purpose of use case projects (6.1), and provides examples of use case projects (6.2).
– Clause 7 explains the purpose of use case templates (7.1), providing a conceptual model of a use case template (7.2), and describing the content of a template: description blocks, predefined fields, instructions, and samples (7.3).
– Clause 8 explains the purpose of use case project plans (8.1), covering the use case initiative governance process (8.2), the template development process (8.3), the template maintenance process (8.4), the use case development process (8.5), and the use case maintenance process (8.6).
– Annex A provides examples of use case projects on IoT (Clause A.2), digital twins (Clause A.3), artificial intelligence (Clause A.4), and privacy for consumer goods and services (Clause A.5).

Figure 1 to Figure 9 use the Unified Modelling Language (UML) diagrams notation.

[1] Numbers in square brackets refer to the Bibliography.

INTERNET OF THINGS (IoT) AND DIGITAL TWIN – BEST PRACTICES FOR USE CASE PROJECTS

1 Scope

This document describes best practices for use case projects in terms of projects, templates and plans, with the objective to improve the consistency of content across different use case projects and enable sharing of knowledge between projects. A long-term goal is to foster interoperability between tools supporting the collection and maintenance of use cases.

This document is intended for developers of use case projects, including in the context of standardization.

The document can be used to complement existing methodology standards such as IEC 62559 [3], [4], [5].

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminology 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

3.1
actor
stakeholder involved in a *use case* (3.4)

3.2
role
function assumed or part played by an external *actor* (3.1) or party, in interaction with the system under focus

Note 1 to entry: Parties include functions, systems, organizations, devices.

3.3
stakeholder
individual, team, organization, or classes thereof, affected by or affecting the *use case* (3.4) directly or indirectly

3.4
use case
specification of a set of actions performed by a system, which yields an observable result that is, typically, of value for one or more roles or other *stakeholders* (3.3) of the system

Note 1 to entry: Based on ISO/IEC 19505–2:2012, 16.3.6.