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Internet of things (loT) — Digital twin — Use cases

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National foreword

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INTERNET OF THINGS (IoT) – DIGITAL TWIN – USE CASES

FOREWORD

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ISO/IEC TR 30172 has been prepared by subcommittee 41: Internet of Things and Digital Twin, of ISO/IEC joint technical committee 1: Information technology. It is Technical Report.

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

Draft	Report on voting
JTC1-SC41/335/DTR	JTC1-SC41/363/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, available at www.iec.ch/members_experts/refdocs and www.iso.org/directives.

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INTRODUCTION

This document provides use cases of digital twin applications in various domains using the template modified from IEC 62559-2 use case template and ISO/IEC TR 22417 use case template. Use case templates used in ISO/IEC JTC 1/AG 8, ISO/IEC JTC 1/AG 11 and ISO/IEC JTC 1/SC 41/AG 25 are also considered for the template in this document.

The use case template includes two parts: Description of use case; Drawings or diagrams depicting the use case. To collect use cases, the first step is to identify application domains of digital twin (DTw) systems and to provide a use case template. Contributors were requested to submit use cases using the provided template.

For improving the quality of the use case description, a guidance is provided to contributors. The guidance includes DTw concepts and reference models for preparing use cases.

By investigating use cases, it is possible to find the new technical requirements from the market, accelerating the transformation of science and technology achievements.

The use case template helps to group and categorize the use cases according to the identified application domains. Readers of this document can find use cases that relate to the desired application domain and can find original submissions of use cases in Annex A, which includes all submissions of use cases.

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INTERNET OF THINGS (IoT) – DIGITAL TWIN – USE CASES

1 Scope

This document provides a collection of representative use cases of digital twin applications in a variety of domains, for example, smart manufacturing and smart cities.

This document is applicable to all types of organization (for example, commercial enterprises, government agencies, and not-for-profit organizations).

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
digital twin
DTw
digital representation of a target *entity* (3.2) with data connections that enable convergence between the physical and digital states at an appropriate rate of synchronization

Note 1 to entry: Digital twin has some or all of the capabilities of connection, integration, analysis, simulation, visualization, optimization, collaboration, etc.

Note 2 to entry: Digital twin can provide an integrated view throughout the life cycle of the target entity.

[SOURCE: ISO/IEC 30173:–, 3.1.1]

3.2
entity
<digital twin> thing (physical or non-physical) having a distinct existence

EXAMPLE Person, object, event, idea, process, etc.

[SOURCE: ISO/IEC 20924:2021, 3.1.18, modified – The domain "<digital twin>" and the example have been added.]

3.3
physical entity
entity in the physical world that can be the subject of sensing and/or actuating

[SOURCE: ISO/IEC 20924:2021, 3.1.27]