

# ISO/IEC 30173:2023-11 (E)

## Digital twin - Concepts and terminology

---

<b>Contents</b>	<b>Page</b>
FOREWORD.....	4
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	6
3.1 General terms .....	6
3.2 Data-related terms .....	9
3.3 Model-related terms .....	9
3.4 Performance-related terms.....	9
3.5 Application-related terms .....	10
4 Symbols and abbreviated terms.....	11
5 Concepts .....	12
5.1 General.....	12
5.2 Advantages and benefits of digital twin .....	12
5.3 Digital twin and related concepts.....	13
5.3.1 Digital twin and the semiotic triangle.....	13
5.3.2 Digital twin and use of system control elements in the information model.....	14
5.3.3 Digital twin and simulation .....	15
5.3.4 Digital twin and cyber-physical system.....	15
5.3.5 Digital twin and Internet of Things.....	16
5.4 Digital twin applications .....	16
5.4.1 General .....	16
5.4.2 Manufacturing.....	16
5.4.3 Buildings and civil infrastructure .....	17
5.4.4 Healthcare .....	17
5.4.5 Cities .....	17
5.5 Digital twin system context.....	17
5.5.1 General .....	17
5.5.2 Digital twin system.....	18
5.5.3 Services .....	18
5.5.4 Application domains.....	18
5.5.5 Infrastructure .....	18
5.5.6 System aspects .....	19
5.6 Life cycle process for digital twin .....	19
5.7 Types of digital twin .....	20
5.7.1 General .....	20
5.7.2 Component digital twin .....	20
5.7.3 Asset digital twin .....	20
5.7.4 System digital twin.....	20
5.7.5 Process digital twin.....	20
6 Digital twin stakeholders .....	20
6.1 General.....	20

6.2	Digital twin system stakeholders .....	21
6.2.1	Developers .....	21
6.2.2	Resource providers.....	21
6.2.3	Integrators .....	21
6.2.4	Users.....	21
6.2.5	Operators .....	21
6.3	Ecosystem partners .....	22
6.3.1	Infrastructure provider .....	22
6.3.2	Service provider .....	22
6.3.3	Standards development organization .....	22
6.3.4	Government and community .....	22
7	Functional view of digital twin .....	22
Annex A (informative) Definition of digital twin in different standards .....		24
Annex B (informative) Semiotics .....		25
B.1	Introduction of the semiotics .....	25
B.2	Digital twin and the semiotic morphisms.....	26
B.3	Relationship between digital twin system context and semiotic triangle .....	27
Bibliography.....		28
Figure 1 – Digital twin system context diagram .....		18
Figure 2 – Digital twin life cycle phases .....		19
Figure 3 – Digital twin stakeholders .....		21
Figure 4 – Functional view of digital twin.....		22
Figure B.1 – Use case ‘Jaguar in the garage’ mapped onto the three semiotic domains .....		25
Table A.1 – Definition of digital twin in different standards .....		24