ISO/IEC 5392:2024-03 (E)

Information technology - Artificial in telligence - Reference architecture of knowledge engineering

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Abbreviated terms **5**

5 Knowledge engineering system-of-interest **6**
5.1 General 6
5.2 Important elements of knowledge engineering 6
5.3 Relationship between KE and AI systems 8

6 KE stakeholders **10**

7 Concerns of KE stakeholders **12**
7.1 Safety and security 12
7.2 Reliability 13
7.3 Availability 13
7.4 Construction quality 13
7.5 Responsibility 13
7.6 Bias reduction 14

8 Reference architecture of KE **14**
8.1 General 14
8.2 User view of KE 14
8.2.1 Data supplier 14
8.2.2 Fundamental technology supplier 15
8.2.3 Algorithm supplier 15
8.2.4 System coordinator 16
8.2.5 Knowledge service provider 16
8.2.6 Knowledge applier 17
8.2.7 Knowledge ecosystem partner 17
8.3 Functional view of KE 17
8.3.1 Functional architecture of KE 17
8.3.2 KE infrastructure layer 19
8.3.3 KE construction layer 19
8.3.4 KE platform layer 19
8.3.5 KE application layer 20
8.3.6 Multi-layer functions 20
8.4 KE distribution architecture 20
8.4.1 General 20
8.4.2 Distributed architecture with semantic web services 21

9 Key technologies of KE and computational methods **22**
9.1 Knowledge representation 22
9.1.1 General 22
9.1.2 Knowledge representation quality 23
9.2 Knowledge modelling 23
9.3 Knowledge acquisition 24
9.4 Knowledge storage 24
9.5 Knowledge fusion 24

9.6 Knowledge computing 24
9.7 Knowledge visualization 25
9.8 Knowledge maintenance 25
9.9 Knowledge exchange 25

10 Enabling technologies and digital infrastructure of KE 25
10.1 Enabling technologies 25
10.1.1 Machine learning 25
10.1.2 Natural language processing 25
10.1.3 Speech processing 26
10.2 Digital infrastructure 26
10.2.1 Big data 26
10.2.2 Cloud computing 26

Annex A (informative) **Examples of fundamental KE tools 27**

Annex B (informative) **Specifications related to KE 28**

Annex C (informative) **Characteristics of typical KE applications 30**

Annex D (informative) **KE life cycle 32**

Annex E (informative) **Building a solution architecture integrating ISO/IEC/IEEE 42010 ..... 34**

Bibliography 41