

ICS 35.240.01
CCS L 70



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 45628-2025

**Artificial intelligence - Knowledge graph - Knowledge exchange
protocol**

人工智能 知识图谱 知识交换协议

Issued on: April 25, 2025

Implemented on: April 25, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

Preface	V
1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 Abbreviations	2
5 General	2
5.1 Knowledge Exchange Protocol Model	2
5.2 Composition of knowledge exchange activities	3
6 Knowledge Description Rules	4
6.1 General	4
6.2 Ontology Description	5
6.2.1 Basic Information Description	5
6.2.2 Entity Type Description	7
6.2.3 Relationship Type Description	8
6.2.4 Attribute type description	10
6.2.5 Rules and Axiom Constraints	12
6.3 Example Description	14
6.3.1 Entity Description	14
6.3.2 Relationship Description	14
6.3.3 Attribute Description	14
6.4 Number setting description	15
6.4.1 Description requirements	15
6.4.2 Numbering rules	15
7 Document-based knowledge exchange17	17
7.1 Knowledge File Structure	17
7.2 Knowledge file description requirements	18
7.2.1 General requirements	18
7.2.2 Document description section description requirements	18
7.2.3 Requirements for the description of the body	19
7.2.4 Instance part description requirements	20
7.3 Document-based knowledge exchange process	20
8 Message-based knowledge exchange	21

8.1 Overview	21
8.2 Participating roles and responsible activities	22
8.2.1 Knowledge Providers22	23
8.2.2 Knowledge consumption	23
8.2.3 Knowledge intermediaries	23
8.2.4 Service management	24
8.3 Knowledge exchange process	24
8.3.1 Types of knowledge exchange	24
8.3.2 Knowledge exchange between two parties	25
8.3.3 Knowledge exchange between multiple parties	29
8.4 Knowledge Message Structure	33
8.4.1 Overview	33
8.4.2 Knowledge exchange messages	34
8.4.3 Service Registration and Discovery Messages	37
Appendix A (Informative) Steps and Operational Flow of Knowledge Description Rules ..	40
A.1 Overview	40
A.2 Determine the scope and purpose of the description	40
A.3 Collect and prepare knowledge elements	40
A.4 Design knowledge description rules	41
A.5 Application description rules	41
A.6 Verification and testing	41
A.7 Documentation and Sharing	41
A.8 Maintenance and Updates	42
Appendix B (Informative) Examples of Instance Descriptions in Knowledge Graphs	43
Appendix C (Informative) Knowledge File Description Example	44
Appendix D (Informative) API Documentation Description	49
Appendix E (Informative) Knowledge Exchange Error Code	50
Appendix F (Informative) Other Knowledge Exchange Models	51
F.1 Multiple rounds of knowledge exchange	51
F.2 Batch Knowledge Exchange	51
F.3 Direct push knowledge exchange	51
Appendix G (Informative) Service Registration and Discovery Message Description Element Field	52
Appendix H (Informative) Knowledge Exchange between Multiple Parties Based on Microservice Architecture	57

Appendix I (Informative) Message Structure in Asynchronous Knowledge Exchange via Knowledge Brokers	58
Appendix J (Informative) Knowledge Exchange Message Description Example	60
Appendix K (Informative) Knowledge Exchange Service Capability Description	66
K.1 Overview	66
K.2 Service Implementation (Service Interface Description)	66
K.3 Service profile (non-functional description of service)	66
K.4 Service Model (Service Functional Description)	67
References	70

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

Some contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document was proposed and coordinated by the National Information Technology Standardization Technical Committee (SAC/TC28).

This document was drafted by: China Electronics Technology Standardization Institute, Shenzhen CESI Information Technology Co., Ltd., Xiamen Yuanting Information Technology Co., Ltd.

Co., Ltd., Jiangsu CESI Technology Development Co., Ltd., Hangzhou Hikvision Digital Technology Co., Ltd., Tongfang Knowledge Network Digital Publishing Technology Co., Ltd.

Co., Ltd., Inspur Yunzhou Industrial Internet Co., Ltd., Institute of Engineering Thermophysics, Chinese Academy of Sciences, Wuhan University of Science and Technology, Chinese Academy of Medical Sciences Institute of Medical Information, Shenyang Neusoft Intelligent Medical Technology Research Institute Co., Ltd., Wuhan Sodata Information Co., Ltd., Shanghai Xiling Information Technology Co., Ltd., GTCOM Technology Co., Ltd., North China Institute of Automation and Control Technology, Shenyang Institute of Automation, Chinese Academy of Sciences Institute, China Electronics Technology Group Corporation Big Data Research Institute Co., Ltd., NetZhi Tianyuan Technology Group Co., Ltd., Shenyang Institute of Computing Technology, Chinese Academy of Sciences Co., Ltd., Shandong Yiyun Information Technology Co., Ltd., Sugon Information Industry Co., Ltd., Zhejiang University of Technology, Dongfang Electric Group Science and Technology Co., Ltd.

Technology Research Institute Co., Ltd., Inspur Software Technology Co., Ltd., Shanghai Wenyu Information Technology Co., Ltd., Xi'an Chuxing Space Technology Co., Ltd.

Company, Beijing Jinghang Computing and Communication Research Institute, Wuhan Haiyun Health Technology Co., Ltd., Peking University, Ant Technology Group Co., Ltd.

Co., Ltd., Hubei Automotive Industry College, Beijing Holsai Smart City Technology Co., Ltd., Neusoft Group Co., Ltd., Zhengzhou Zhongye Technology Co., Ltd.

Co., Ltd., China Electric Power Research Institute Co., Ltd., Southwest Jiaotong University, China Mobile (Shanghai) Information and Communication Technology Co., Ltd., Terry Digital Technology (Beijing) Co., Ltd., Beijing Zhitong Yunlian Technology Co., Ltd., Shaanxi Normal University, Chinese People's Liberation Army Army Service College, China Southern Power Grid Co., Ltd. Ultra-high Voltage Transmission Company, Dongguan South China Design and Innovation Institute, Tianjin University, Beijing Machinery Industry Automation Research Institute Institute Co., Ltd., Suzhou Interlezhon Intelligent Technology Co., Ltd., Guangdong Jiulian Technology Co., Ltd., Guangzhou Jinyu Medical Testing Center Co., Ltd., Shenzhen Panyueliang Innovation Technology Co., Ltd., Inspur Communication Information System Co., Ltd., Xiamen Dinake IoT Smart Technology Co., Ltd.

Company, Capital Institute of Physical Education, Inspur General Software Co., Ltd., Sichuan China Tobacco Industry Co., Ltd., Guangzhou CESI Standard Testing Institute Co., Ltd., Midea Group (Shanghai) Co., Ltd., Deepin (Shandong) Digital Technology Group Co., Ltd., the First Affiliated Hospital of Dali University, Anhui Qi Technology Co., Ltd., Shenzhen Value Online Information Technology Co., Ltd., Putian University, Shenzhen Weiyang Technology Co., Ltd., Qizhidao Technology Co., Ltd., Hangzhou Zhongfu Science and Technology Innovation Research Institute Co., Ltd., Zhengzhou Changxiang Hi-Tech Co., Ltd., Nobikan Artificial Intelligence Technology (Chengdu Co., Ltd., China Southern Power Grid Research Institute Co., Ltd., Sinopec Yingke Information Technology Co., Ltd., Guoke Nengchuang (Beijing Beijing) Technology Co., Ltd., Shenzhen Mingtong Technology Co., Ltd., Wenzhou Chint Smart Home Technology Co., Ltd., Hangzhou Liangzhi Data Technology Co., Ltd., Zhongshi Kangkai Technology Co., Ltd., National Pipeline Network Group Northern Pipeline Co., Ltd., Fujian Torch Electronic Technology Co., Ltd.

Company, China Nuclear Information Technology (Beijing) Co., Ltd., Zhiqi Railway Equipment Co., Ltd., Guanwei Intelligent Technology (Beijing) Co., Ltd., China Electronics Pengcheng Intelligent Equipment Co., Ltd., Guangzhou Yunqu Information Technology Co., Ltd., Ma'an Shan People's Hospital, Chengdu Paiwote Technology Co., Ltd.

Company, Guangdong Power Grid Co., Ltd. Information Center, Shenzhen Jiangxing Lianjia Intelligent Technology Co., Ltd., China Unicom Wo Yuedu Technology and Culture Co., Ltd., Shenzhen Hanli Technology Co., Ltd., Shenzhen Chuangxin Internet Communication Technology Co., Ltd., Jingcheng Jiayu Technology (Shanghai) Co., Ltd., COSCO Yun