

I n t e r n a t i o n a l T e l e c o m m u n i c a t i o n U n i o n

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Series F

Supplement 4

(04/2021)

SERIES F: NON-TELEPHONE TELECOMMUNICATION
SERVICES

Overview of convergence of artificial intelligence and blockchain

ITU-T F-series Recommendations – Supplement 4

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Supplement 4 to ITU-T F-series Recommendations

Overview of convergence of artificial intelligence and blockchain

Summary

Artificial intelligence (AI) is one of core essential driving forces of a new round of industrial reform, which can affect promoting the upgrading of the traditional industries. Blockchain presents opportunities for disruptive innovations, which enables global businesses to transact business with less friction and more trust. AI and blockchain promote and influence each other, and their convergence could provide major driving forces for industries and great creativity across a wide range of business applications in many fields.

There are many benefits and challenges to combining AI and blockchain together. This Supplement focuses on the research on the convergence of AI and blockchain, specifically analyses the mutual promotion between AI and blockchain, and provides a technical reference for the application of AI and blockchain. In addition, Supplement 4 to ITU-T F-series Recommendations also provides application analysis of the convergence of AI and blockchain.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T F Suppl. 4	2021-04-30	16	11.1002/1000/14651

Keywords

Artificial intelligence, blockchain, convergence.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/114651>.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Supplement 4 to ITU-T F-series Recommendations

Overview of convergence of artificial intelligence and blockchain

1 Scope

This Supplement provides an overview of the convergence of artificial intelligence and blockchain, and provides a technical reference for the converged application of artificial intelligence and blockchain.

The scope of this Supplement includes:

- Advantages, challenges, characteristics of artificial intelligence and blockchain;
- Mutual promotions of artificial intelligence and blockchain;
- Converged applications of artificial intelligence and blockchain.

2 References

None.

3 Definitions

3.1 Terms defined elsewhere

This Supplement uses the following terms defined elsewhere:

3.1.1 application [b-ITU-T Y.2091]: A structured set of capabilities, which provide value-added functionality supported by one or more services, which may be supported by an API interface.

3.1.2 artificial intelligence (AI) [b-ETSI GR ENI 004]: Computerized system that uses cognition to understand information and solve problems.

NOTE 1 – [b-ISO/IEC 2382-28] defines AI as "an interdisciplinary field, usually regarded as a branch of computer science, dealing with models and systems for the performance of functions generally associated with human intelligence, such as reasoning and learning".

NOTE 2 – In computer science AI research is defined as the study of "intelligent agents": any device that perceives its environment and takes actions to achieve its goals.

NOTE 3 – This includes pattern recognition and the application of machine learning and related techniques.

NOTE 4 – Artificial intelligence is the whole idea and concepts of machines being able to carry out tasks in a way that mimics the human intelligence and would be considered "smart".

3.1.3 blockchain [b-ITU-T FG-DPM TR D3.5]: A peer to peer distributed ledger based on a group of technologies for a new generation of transactional applications which may maintain a continuously growing list of cryptographically secured data records hardened against tampering and revision.

NOTE 1 – Blockchains can help establish trust, accountability and transparency while streamlining business processes.

NOTE 2 – Blockchains can be classified as three types (i.e., public, consortium and private) based on the relationship of the participants and the way to provide services.

NOTE 3 – Definition compatible with [b-ISO 22739].

3.1.4 blockchain data [b-ITU-T FG-DPM TR D3.5]: The data in a blockchain, such as distributed append-only ledgers, state information, permission policies etc.

NOTE – Blockchain data may be distributed and be stored in blockchain peers. A blockchain peer may store whole or part of the data in a blockchain.