

Recommendation

ITU-T M.3384 (04/2023)

SERIES M: Telecommunication management, including
TMN and network maintenance

Telecommunications management network

Intelligence levels of artificial intelligence- enhanced telecom operation and management

ITU-T M-SERIES RECOMMENDATIONS

Telecommunication management, including TMN and network maintenance

Introduction and general principles of maintenance and maintenance organization	M.10-M.299
International transmission systems	M.300-M.559
International telephone circuits	M.560-M.759
Common channel signalling systems	M.760-M.799
International telegraph systems and phototelegraph transmission	M.800-M.899
International leased group and supergroup links	M.900-M.999
International leased circuits	M.1000-M.1099
Mobile telecommunication systems and services	M.1100-M.1199
International public telephone network	M.1200-M.1299
International data transmission systems	M.1300-M.1399
Designations and information exchange	M.1400-M.1999
International transport network	M.2000-M.2999
Telecommunications management network	M.3000-M.3599
Integrated services digital networks	M.3600-M.3999
Common channel signalling systems	M.4000-M.4999

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T M.3384

Intelligence levels of artificial intelligence-enhanced telecom operation and management

Summary

Recommendation ITU-T M.3384 provides definitions, classifications, object selection and an automatic evaluating mechanism for the evaluation of the intelligence levels of artificial intelligence-enhanced telecom operation and management systems that comply with the framework specified in Recommendation ITU-T M.3080.

History *

Edition	Recommendation	Approval	Study Group	Unique ID
1.0	ITU-T M.3384	2023-04-29	2	11.1002/1000/15517

Keywords

AITOM, artificial intelligence, artificial intelligence enhanced telecom operation and management, intelligence level.

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

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

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.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents/software copyrights, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the appropriate ITU-T databases available via the ITU-T website at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2023

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Table of Contents

		Page
1	Scope	1
2	References.....	1
3	Definitions	1
	3.1 Terms defined elsewhere	1
	3.2 Terms defined in this Recommendation	2
4	Abbreviations and acronyms	2
5	Conventions	3
6	Overview	3
7	Specification and classification rules for IL-AITOM	3
	7.1 Specification of IL-AITOM.....	3
	7.2 Classification rules for IL-AITOM	4
8	Object and evaluation result of IL-AITOM.....	6
	8.1 Evaluated objects.....	6
	8.2 Intelligence level evaluation result of an evaluated object.....	9
9	Mechanism of automatic evaluation for IL-AITOM	10
	Appendix I – A use case on intelligence level of energy-saving management.....	11
	Appendix II – A use case on intelligence level of wilderness areas factories.....	13
	Appendix III – Gap analysis between this Recommendation and other telecommunication standards	14
	Bibliography	15

Recommendation ITU-T M.3384

Intelligence levels of artificial intelligence-enhanced telecom operation and management

1 Scope

This Recommendation describes the principles for intelligence levels of artificial intelligence-enhanced telecom operation and management (IL-AITOM) systems that follow the framework specified in [ITU-T M.3080]. This Recommendation can be used as a guideline to plan the evolution of intelligent operation and management systems. This Recommendation includes:

- specification and classification rules for IL-AITOM;
- evaluated objects of IL-AITOM;
- general architecture of intelligence levels evaluation of AITOM;
- typical use cases (see Appendices I and II).

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T M.3080] Recommendation ITU-T M.3080 (2021), *Framework of artificial intelligence enhanced telecom operation and management (AITOM)*.

[TMF GB991] GB991, *TM Forum's core frameworks concepts and principles v22.5.0* (2022). Parsippany, NJ: TM Forum. Available [viewed 2023-06-19] at: <https://www.tmforum.org/resources/standard/gb991-tm-forums-core-frameworks-concepts-and-principles-v22-5-0/>

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 artificial intelligence (AI) [b-ISO/IEC 2382]: 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.

3.1.2 artificial intelligence pipeline [ITU-T M.3080]: A set of logical nodes, each with specific functionalities, that can be combined to form an artificial intelligence (AI) application in systems of telecom operation and management.

3.1.3 artificial intelligence sandbox [ITU-T M.3080]: An environment in which artificial intelligence (AI) models can be trained and tested, and their effects on the network are evaluated.

3.1.4 capability customization [ITU-T M.3080]: Personalized capability, which does not exist in the capability directory, customized for external customers to meet their requirements.

3.1.5 common artificial intelligence model repository [ITU-T M.3080]: The part of the archive that contains and manages the artificial intelligence (AI) models, constructed by general algorithms, such as classification algorithms, and is thus responsible for the storage and preservation of the AI models.

3.1.6 computing engine framework [ITU-T M.3080]: A framework which provides an operation environment or coding resources in the context of artificial intelligence (AI)-based applications or developments.

3.1.7 customer-oriented marketplace [ITU-T M.3080]: A collection of functional sets that exposes capability to external telecom customers, especially enterprises and industries. The exposed capability includes applications, service, data and artificial intelligence (AI) capability.

3.1.8 function block [b-ITU-T M.3010]: The smallest (deployable) unit of TMN management functionality that is subject to standardization.

3.1.9 intent [b-ITU-T X.1257]: The user reason or purpose for initiating the interaction with a service provider.

3.1.10 management service [b-ITU-T M.3010]: A management service is an offering fulfilling specific telecommunications management needs.

3.1.11 monitor [b-ITU-T Q.9]: A functional unit that observes and records selected activities within a system for analysis.

3.1.12 orchestration [b-ITU-T Y.3100]: In the context of IMT-2020, the processes aiming at the automated arrangement, coordination, instantiation and use of network functions and resources for both physical and virtual infrastructures by optimization criteria.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 action implementation: A stage determined according to the process of decision or policy so that it can be implemented effectively in the system.

3.2.2 intelligence level of artificial intelligence-enhanced telecom operation and management: Classification for application of automation capabilities including those enabled by the integration of artificial intelligence techniques in a set of systems that follows the framework of artificial intelligence-enhanced telecom operation and management.

3.2.3 intent mapping: A process to translate intent into specific configurations and policies in order to make a system recognize user reason or purpose.

3.2.4 operation stage: General subsets for process of telecom operation and management.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

5G fifth Generation

AI Artificial Intelligence

AITOM Artificial Intelligence-enhanced Telecom Operation and Management

IL-AITOM Intelligence Levels of Artificial Intelligence-enhanced Telecom Operation and Management

IMT-2020 International Mobile Telecommunications-2020

O&M Operation and Maintenance