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Draft new Recommendation ITU-T Y.IMT2020-MEVE-req-frame

Future networks including IMT-2020: requirements and framework for measurement of effectiveness and value evaluation of autonomous networks

1. Scope

This draft Recommendation specifies the future networks including IMT-2020: requirements and framework for measurement of effectiveness and value evaluation of autonomous networks.

The scope of this Recommendation includes:

- Overview of measurement of effectiveness and value evaluation of autonomous networks.
- Requirements for measurement of effectiveness and value evaluation of autonomous networks
- Framework for measurement of effectiveness and value evaluation of autonomous networks

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 Y.3100] Recommendation ITU-T Y.3100 (2017), Terms and definitions for IMT-2020 network.

Editor's note: some key references should be included.

[TBD]

3. Definitions

3.1. Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 IMT-2020 [b-ITU-T Y.3100]: Systems, system components, and related technologies that provide far more enhanced capabilities than those described in [b-ITU-R M.1645].

3.1.2 Effectiveness Indicators [b-TMF IG1256]: A set of indicators that can be used to evaluate the effect of introducing autonomy capability into telecom systems in terms of business growth, customer experience, and operational efficiency.

[TBD]

3.2. Terms defined in this Recommendation

This Recommendation defines the following terms:

[TBD]

4. Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AI Artificial Intelligence
AN Autonomous Networks
EI Effectiveness Indicators

O&M Operation&Maintenance
ICT Information and Communications Technology
OMC Operation and Maintenance Center
OSS Operation Support System
BSS Business Support System
[TBD]

5. Conventions

In this Recommendation:

The keywords "is required to" indicate a requirement which must be strictly followed and from which no deviation is permitted, if conformance to this Recommendation is to be claimed.

The keywords "is recommended" indicate a requirement which is recommended but which is not absolutely required. Thus, this requirement need not be present to claim conformance.

The keywords "can optionally" indicate an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor's implementation must provide the option, and the feature can be optionally enabled by the network operator/service provider. Rather, it means the vendor may optionally provide the feature and still claim conformance with this Recommendation.

6. Introduction

6.1. Overview

The vision of autonomous network has become the consensus of the industry. Globally, standards organizations, industry organizations and open source communities in the industry actively promote autonomous network development. In order to realize the vision of autonomous network, it is necessary to introduce core technologies such as intelligent perception, intelligent diagnosis, intelligent prediction, intelligent control, etc., facing the customer service, network operation, network element equipment and other aspects, to provide automatic and intelligent operation and service management capabilities.

SDOs, CSPs, manufacturers, network management system integrators, other IT software manufacturers, third-party research and development institutions and other industrial parties actively tap into the technology fields related to autonomous networks, and the technology research and application in the field of communication networks are very active.

As far as relevant activities in autonomous networks related standardization concerning measurement and evaluation aspects, TMF, in [b-TMF GB1040], provides the framework of "Measuring and Managing autonomy", and a methodology to focus on high-levels of autonomous operations' outcome. In [b-TMF IG1252], the concepts of Autonomous Networks Level are described, which include Autonomous Networks Level methodology and approach that consists of technology maturity model and key effectiveness indicators, operational processes. Another TMF specification, [b-TMF IG1256], defines autonomous network effectiveness indicators, describing the concepts, framework, and the selection principles of autonomous network effectiveness indicators.

3GPP, in [b-3GPP TR28.909], studies evaluation of autonomous network levels. The specification introduces the relevant studies in other SDOs, concepts of autonomous network levels evaluation and key effectiveness indicators (KEI).

However, the planning of relevant standards for autonomous networks among the standard organizations is relatively independent, and there is a lack of unified measurement of effectiveness and value evaluation to lead the intergenerational evolution of autonomous networks.

Autonomous network construction is in an important developmental window of opportunity of technological breakthrough, integrated innovation and scale application, and needs top-level design,

system planning and standard leading. It is necessary to follow the principles of value-oriented and practice-oriented, establish the indicator system and calculation method of the value measurement of the autonomous network in a unified way, provide effective guidance for the construction planning of operators and the product research and development of manufacturers.

In order to guide the evolution of autonomous network capabilities, the scope, metric measurement specifications and value evaluation methods of EIs should be determined in the top-level design of autonomous networks.

The EI indicators fall into two categories: application effectiveness indicators and business value indicators.

Application effectiveness indicators are metrics defined to reflect the application effectiveness of automation and intelligence in different domains according to the characteristics of various network and service domains. They are calculated through the corresponding metric measurement specifications.

Business value indicators are defined based on application effectiveness indicators to quantify the overall business value resultant from the evolution of autonomous networks. The business value indicators are calculated from the application effectiveness indicators by applying corresponding value evaluation methods.

[TBD]

7. Requirements for measurement of effectiveness and value evaluation

Editor's Note: This clause will specify the requirements for measurement of effectiveness and value evaluation, including but not limited to effectiveness indicators, metric measurement specification and value evaluation method.

7.1. Effectiveness Indicators

7.1.1. Application Effectiveness Indicators

7.1.1.1 Description

In order to drive the improvement of capabilities in various network and service domains, and according to the application characteristics in various domains, application effectiveness indicators are specified to reflect the application effectiveness of automation and intelligence.

Editor's note: some explanatory text about "Application effectiveness" is needed.

7.1.1.2 Requirements

Application effectiveness indicators are required to support measuring the application effectiveness of automation and intelligence in a given network or service domains.

Application effectiveness indicators are required to meet the characteristics of positive correlation, objectivity, quantification, accessibility and transparency.

[TBD]

7.1.2. Business Value Indicators

7.1.2.1 Description

The business value indicators are based on application effectiveness indicators, focus on quality, efficiency and cost effectiveness. These indicators are calculated from objective data such as application effectiveness indicator values in relevant domains, in order to verify the overall business value.

7.1.2.2 Requirements

Business value indicators are required to support the quantitative measurement of the overall business value brought by the evolution of autonomous networks.

Business value indicators are required to support providing quantitative decision-making basis for the subsequent construction of relevant systems.

[TBD]

7.2. Metric Measurement Specification

Editor's Note: This subclause specifies the metric measurement requirements of application effectiveness indicators, e.g., from which network system, which interface, and which process is used to collect data, and how to measure and calculate the corresponding indicator values.

[TBD]

7.3. Value Evaluation Method

Editor's Note: This subclause specifies the value evaluation requirements of business value indicators, e.g., how to evaluate business value indicators by aggregating application effectiveness indicators.

[TBD]

8. Framework for measurement of effectiveness and value evaluation of autonomous networks

Editor's Note: This clause describes the overall framework for measurement of effectiveness and value evaluation of autonomous networks, including domain-specific measurements and cross-domain value evaluation. The overall framework transforms the network system data firstly into effectiveness indicators in a specific domain and secondly into value evaluation results for the overall network.

The framework provides a systematic hierarchy to conduct measurement of effectiveness and value evaluation of autonomous network.

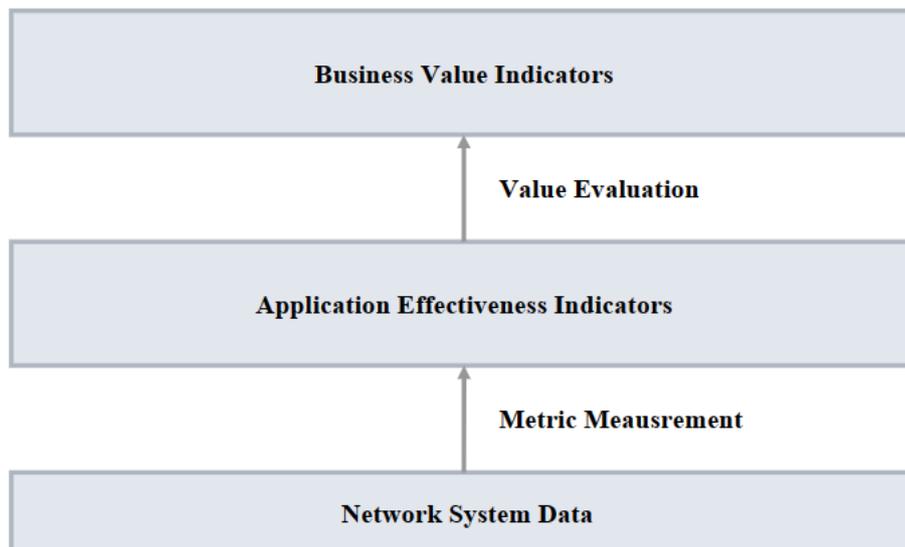


Figure 1 -Illustrative framework for measurement of effectiveness and value evaluation

[TBD]

Appendix I

Measurement of effectiveness and value evaluation of autonomous networks in the context of typical use cases of autonomous networks

(This appendix does not form an integral part of this Recommendation.)

Editor's Note: This appendix illustrates the measurement of effectiveness and value evaluation of autonomous networks, in the context of typical use cases selected from Supplement 71 to ITU-T Y-3000.

Bibliography

- [b-TMF GB1040] TM Forum GB1040 (2022), *MAMA Framework Guidebook v1.0.0*
- [b-TMF IG1252] TM Forum IG1252 (2022), *Autonomous Network Levels Evaluation Methodology v1.2.*
- [b-TMF IG1256] TM Forum IG1256 (2022), *Autonomous Network Effectiveness Indicators v1.0.0.*
- [b-3GPP 28.909] 3GPP TR28.909, *Technical Specification Group Services and System Aspects; Study on evaluation of autonomous network levels*
- [TBD]

Annex I

A.1 justification for proposed draft new Recommendation Y.IMT2020-MEVE- req-frame

Question:	20/13	Proposed new ITU-T Recommendation	Geneva, 13 – 24 March 2023	
Reference and title:	Draft Recommendation ITU-T Y.IMT2020-MEVE -req-frame, "Future networks including IMT-2020: requirements and framework for measurement of effectiveness and value evaluation of autonomous networks"			
Base text:	SG13-TD362-R2/WP1		Timing:	2024-Q4
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<p>Scope (defines the intent or object of the Recommendation and the aspects covered, thereby indicating the limits of its applicability):</p> <p>This Recommendation specifies “Future networks including IMT-2020: requirements and framework for measurement of effectiveness and value evaluation of autonomous networks”.</p> <p>The scope of this Recommendation includes:</p> <ul style="list-style-type: none"> • Overview of measurement of effectiveness and value evaluation of autonomous networks. • Requirements for measurement of effectiveness and value evaluation of autonomous networks • Framework for measurement of effectiveness and value evaluation of autonomous networks 				
<p>Summary (provides a brief overview of the purpose and contents of the Recommendation, thus permitting readers to judge its usefulness for their work):</p> <p>Autonomous network construction is in an important developmental window of opportunity of technological breakthrough, integrated innovation and scale application, and needs top-level design, system planning and standard leading. It is necessary to follow the principles of value-oriented and practice-oriented, establish the measurement of effectiveness and value evaluation of autonomous networks in a unified way, and provide effective guidance for the construction planning of operators and the product research and development of manufacturers.</p> <p>The following aspects of measurement of effectiveness and value evaluation of autonomous networks will be addressed:</p> <ul style="list-style-type: none"> • Effectiveness Indicators <p>The Effectiveness Indicators fall into two categories: application effectiveness indicators and business value indicators.</p> <ul style="list-style-type: none"> • Metric Measurement Specification <p>Application effectiveness indicators value is calculated through the corresponding metric measurement specifications.</p> <ul style="list-style-type: none"> • Value Evaluation Method <p>Value evaluation method is to evaluate overall business value indicators by aggregating application effectiveness indicators.</p> <ul style="list-style-type: none"> • Framework <p>The framework provides a systematic hierarchy to conduct measurement of effectiveness and value evaluation of autonomous networks.</p>				
<p>Relations to ITU-T Recommendations or to other standards (approved or under development):</p> <ul style="list-style-type: none"> - ITU-T Recommendation Y.3173, <i>Framework for evaluating intelligence levels of future networks including IMT-2020</i> - ITU-T draft Recommendation Y.AN-Arch-fw, <i>Architecture Framework for Autonomous Networks</i> - ITU-T Supplement 71 to ITU-T Y-3000 - TM Forum GB1040, <i>MAMA Framework Guidebook v1.0.0</i> - TM Forum IG1256, <i>Autonomous Network Effectiveness Indicators v1.0.0</i> - TM Forum IG1252, <i>Autonomous Network Levels Evaluation Methodology</i> - 3GPP SA5 TR28.909, <i>Study on evaluation of autonomous network levels</i> 				

Liaisons with other study groups or with other standards bodies:

3GPP, TM Forum, ISO/IEC JTC1, IEC SyC COMM

Supporting members that are committing to contributing actively to the work item:

China Mobile, ZTE
