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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

E-health multimedia services and applications –
Multimedia e-health data exchange services

Requirements on communication platform for multimedia brain information

Recommendation ITU-T H.861.0



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Requirements on communication platform for multimedia brain information

Summary

Recommendation ITU-T H.861.0 describes a conceptual ecosystem intended to exchange brain data based on communication platform requirements and definitions. Starting from a background of brain data exchange in the context of e-health, a functional framework model for a multimedia brain information platform (MBI-PF) is outlined. This model is then developed into a set of communication platforms which enable not only experts but also non-experts to utilize brain data for monitoring and maintaining health status of the brain.

History

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FOREWORD

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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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Requirements on communication platform for multimedia brain information

1 Scope

This Recommendation describes requirements for exchanging multimedia brain information (MBI). This Recommendation primarily considers information provided by magnetic resonance imaging (MRI) because it has advantages of having very high spatial resolution in non-invasive techniques of brain study. The brain information provided by other techniques is beyond the scope of this Recommendation.

NOTE – Other techniques for handling brain information include electroencephalography (EEG), near infra-red spectroscopy (NIRS) and magnetoencephalography (MEG).

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.3501] Recommendation ITU-T Y.3501 (2016), *Cloud computing – framework and high-level requirements*.

[ISO 12052] ISO 12052:2006 (2006), *Health informatics – Digital imaging and communication in medicine (DICOM) including workflow and data management*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 availability [b-ISO/IEC 27000]: Property of being accessible and usable on demand by an authorized entity.

3.1.2 cloud computing [b-ITU-T Y.3500]: Paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand.

NOTE – Examples of resources include servers, operating systems, networks, software, applications, and storage equipment.

3.1.3 cloud service [b-ITU-T Y.3500]: One or more capabilities offered via cloud computing (3.1.2) invoked using a defined interface.

3.1.4 communication platform [b-ITU-T T.180]: Consists in a number of communication service providers, in a homogeneous access mechanism, by means of which service users, which are distributed in space, may establish communication between them.

3.1.5 confidentiality [b-ISO/IEC 27000]: Property that information is not made available or disclosed to unauthorized individuals, entities, or processes.

3.1.6 information security [b-ISO/IEC 27000]: Preservation of confidentiality (3.1.5), integrity (3.1.7) and availability (3.1.1) of information.

NOTE – In addition, other properties, such as authenticity, accountability, non-repudiation, and reliability can also be involved.

3.1.7 integrity [b-ISO/IEC 27000]: Property of accuracy and completeness.

3.1.8 personally identifiable information (PII) [b-ISO/IEC 29100]: Any information that (a) can be used to identify the PII principal to whom such information relates, or (b) is or might be directly or indirectly linked to a PII principal.

NOTE – To determine whether a PII principal is identifiable, account should be taken of all the means which can reasonably be used by the privacy stakeholder holding the data, or by any other party, to identify that natural person.

3.1.9 service provider [b-ITU-T M.1400]: A general reference to an operator that provides telecommunication services to customers and other users, either on a tariff or contract basis. A service provider may or may not operate a network. A service provider may or may not be a customer of another service provider.

NOTE – Typically, the service provider acquires or licenses content from content providers, and packages this into a service that is consumed by the end-user.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 brain healthcare quotient: A numerical indicator representing physical characteristics of the brain that are purported to be indicative of some state of a health-related condition.

3.2.2 imaging: A technique and process of visualization of the internal parts of the brain.

3.2.3 intervention: An action or activity undertaken to address a specific client problem and to improve, maintain or restore health, or to prevent illness.

3.2.4 magnetic resonance imaging: A medical imaging technique used in radiology to investigate the anatomy and physiology of the body in both health and disease.

3.2.5 multimedia brain information platform: A platform for exchange information and data concerning the brain such as MRI data.

3.2.6 non-invasive: Medical procedures where no tools that break the skin or physically enter the body are involved.

3.2.7 spatial resolution: The ability of an imaging system to discriminate between two adjacent high-contrast brain objects.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

BHQ	Brain Healthcare Quotient
DICOM	Digital Imaging and Communication in Medicine
EEG	Electroencephalography
fMRI	functional Magnetic Resonance Imaging
MBI	Multimedia Brain Information
MEG	Magnetoencephalography
MRI	Magnetic Resonance Imaging