

# TECHNICAL REPORT



User's quality of experience on multimedia conferencing services –  
Part 1: General

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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ICS 33.160.60

ISBN 978-2-8322-7892-5

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CONFERRING SERVICES –****Part 1: General****FOREWORD**

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The text of this Technical Report is based on the following documents:

Draft	Report on voting
100/4037/DTR	100/4071/RVDTR

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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## INTRODUCTION

With the global COVID-19 pandemic, business and education meetings have shifted from offline to online environments. Consequently, a range of multimedia conferencing services has been developed, enabling users to choose and enjoy conferencing services based on personal preferences. To ensure optimal user experience, it is essential to measure the quality of experience (QoE) for multimedia conferencing services. However, there is currently a lack of standardized methods for measuring a user's QoE in this context. Thus, there is a pressing need to provide guidelines for measuring and evaluating a user's QoE for multimedia conferencing services.

Traditionally, quality of service (QoS) has been measured for network data communication, represented by objective index values like delay, throughput, and jitter. In contrast, QoE represents a user's level of satisfaction with a specific service and reflects human emotional quality. As such, QoE is subject to overall service performance from the user's perspective. In the case of multimedia conferencing services, measuring QoE is challenging due to varying user preferences/requirements and service/application characteristics. Therefore, a unified framework is necessary to measure and evaluate a user's QoE for multimedia conferencing services.

This document aims to provide guidelines for enhancing a user's QoE for multimedia conferencing services. The series specifies general considerations and requirements to enhance a user's QoE and measurement methods for associated QoE parameters.

The IEC 63478 series consists of the following parts:

- Part 1: General;
- Part 2: Requirements; and
- Part 3: Measurement methods.

Part 1 of IEC TR 63478-1 (Technical Report) describes general considerations to measure user's QoE.

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Part 2 of IEC 63478-2 (International Standard) describes the requirements to be considered to measure user's QoE.

Part 3 of IEC 63478-3 (International Standard) describes the measurement methods for QoE parameters.

# USER'S QUALITY OF EXPERIENCE ON MULTIMEDIA CONFERRING SERVICES –

## Part 1: General

### 1 Scope

This part of IEC 63478 describes general considerations to be taken for measurement of a user's quality of experience (QoE) on multimedia conferencing services.

### 2 Normative references

There are no normative references in this document.

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### 3.1 Definitions

##### 3.1.1 QoE

measure of delight or annoyance of a user's experiences for a multimedia service from the viewpoint of the entire service experience

#### 3.2 Abbreviated terms

MCC	multimedia conferencing client
MCS	multimedia conferencing server
QMA	QoE measurement agent
QMM	QoE measurement manager
QoE	quality of experience
UI/UX	user interface/experience

### 4 Consideration on QoE

#### 4.1 QoE characteristics

QoE refers to the quality that a user has experienced and perceived during a multimedia service. It can be represented by the subjective indicators of service users.

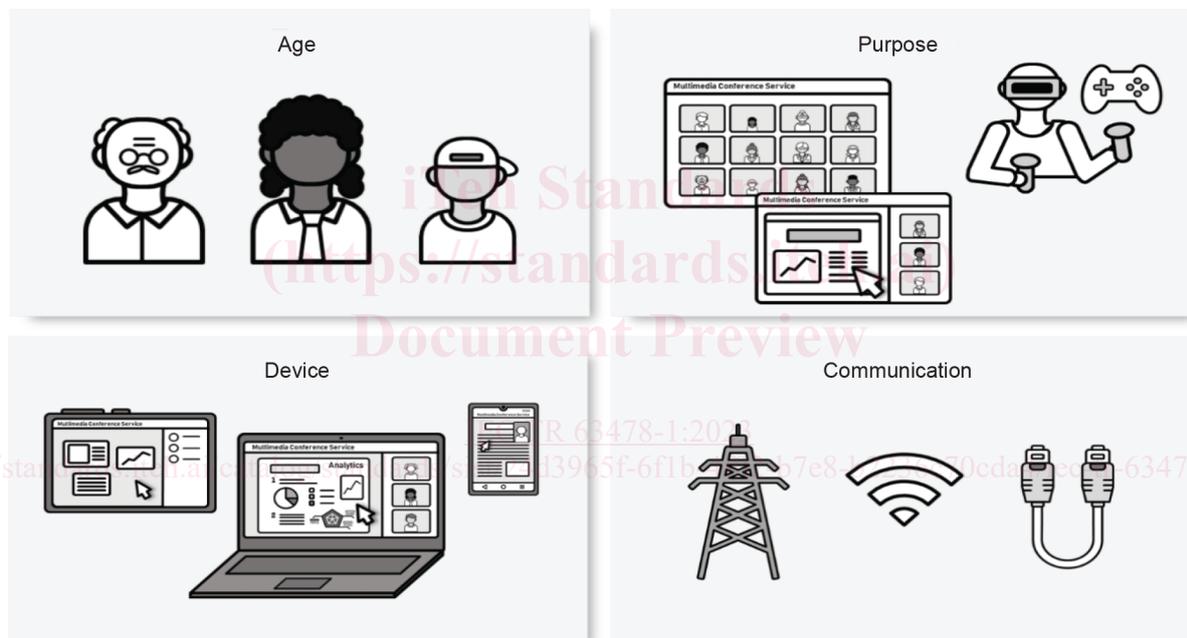
In general, QoE involves the subjective experience of users, and it might be possible to judge the QoE for a small number of people. However, it might be more accurate if the relevant data are collected from many people, if possible. A set of QoE parameters can be considered to measure a user's QoE. Such QoE parameters are associated with the functions that are

provided by the multimedia conferencing service and also the subjective quality experienced by the user. In addition, the emotions felt by each user can be considered to measure the user's QoE in a variety of ways. For example, QoE can be expressed as a simple expression of user satisfaction, such as a five-point satisfaction survey. Annex B provides various standards for measuring a user's QoE.

The QoE measurement is purposed to evaluate the user's satisfaction for a service and to help the user in choosing a specific service, as per their preference. This QoE measurement can also be used by service/application developers to provide much more enhanced services to users.

#### 4.2 QoE requirements

The multimedia conferencing service refers to a service that allows users to participate in an online conference by using video and audio. It is noted that there can be many different requirements or preferences for a user's QoE on multimedia conferencing service, according to the age of user, the purpose of the service, the device used for the service, and the communication environment, as shown in Figure 1.



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**Figure 1 – Various QoE requirements for multimedia conferencing services**

- **Age**  
The QoE requirements may depend on the age of the user. If the user is old age, a user might want large text rather than small text on the UI screen, and the user might focus on the volume and clarity of the audio, rather than the quality of the video. On the other hand, if the user is young, the user might focus on a high-quality image or video, rather than a high-quality voice.
- **Purpose**  
The QoE requirements might also vary according to the purpose of the multimedia conferencing service. If it is used for group calls, the users want to focus on audio. On the other hand, the service for purpose of presentation will require an advanced functionality or UI to share documents, such as screen sharing. In addition, latency is important for a discussion, less so when giving a presentation.

- **Device**  
The QoE requirements of users might also be different, depending on the type of device used in the multimedia conferencing service, such as a smartphone, a tablet, a laptop computer, and a smart TV.
- **Communication**  
The QoE requirements might also be affected by the communication network environment in which the user is located, such as Wi-Fi, Ethernet, and cellular networks.

### 4.3 QoE parameters

The QoE parameters are used to evaluate the satisfaction level experienced by a user in a multimedia conferencing service. These QoE parameters include the specific functions of multimedia conferencing service and the user's opinion to represent its satisfaction level.

Table 1 shows some examples of QoE parameters that can be used for QoE measurement.

**Table 1 – QoE parameters**

QoE parameter	Description
Video quality	Indicates the satisfaction with the quality of the screen that the user has experienced during the multimedia conferencing services.
Audio quality	Indicates the satisfaction with the audio quality experienced by the user during the multimedia conferencing services.
Synchronization	Refers to the synchronization for video and audio playback and indicates the satisfaction with synchronization that the user has experience during the multimedia conferencing services.
Accessibility	Indicates how much the multimedia conferencing service can be easily accessed.
Inter-connectivity	Indicates how much the service can be easily linked with the other multimedia services, such as file sharing, screen sharing and whiteboard.
Openness	Indicates how much the service supports the compatibility with other applications during the multimedia conferencing services.
Participation	Represents how much the participant can actively participate in the meeting. For example, it represents functions such as raising hands during a meeting, chatting to answer questions and expressing emotions.
UI/UX	Indicates the quality of UI and UX experienced by users. For example, in the UX-Honeycomb model, the satisfaction level can be expressed by a total of seven scales.

## 5 QoE measurement framework

### 5.1 Functional entities

For QoE measurement, the following four functional entities are considered.

- **Multimedia conferencing server (MCS)**  
An MCS is a server to provide a multimedia conferencing service. An MCS performs multimedia communication with an MCC during a multimedia conferencing service.
- **Multimedia conferencing client (MCC)**  
An MCC is a client for a multimedia conferencing service, and it is implemented by a client program on the user's device. An MCC performs multimedia communications with an MCS.