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| **Title:** | Report on ITU-T SG12 lead activities (October 2019 – January 2020) |
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| **Keywords:** | QoS; QoE; driver distraction; car communications; video quality; SG12; |
| **Abstract:** | In line with WTSA-16 Resolution 1, this report provides updates about the SG12 lead study group activities. |

## Lead study group on quality of service and quality of experience

In the reporting period, SG12 held one study group meeting.

Since the last meeting of TSAG, new organizations have enrolled in ITU-T SG12 as new Associates, a positive trend that can be attributed to proactive outreach, technically sound outputs, and constructive and cordial working environment.

The executive summary of the Nov-Dec 2019 meeting can be found at <https://itu.int/en/ITU-T/studygroups/2017-2020/12/Pages/1911-summary.aspx>. A webinar ([Announcement](https://news.itu.int/webinar-itu-standards-quality-video-streaming-cloud-gaming-fintech/) | [Recording](https://itu.int/en/ITU-T/studygroups/2017-2020/12/Documents/2019-12-05-webinar.mp4) | [Slides](https://www.itu.int/md/T17-SG12-191126-TD-GEN-1014/en)) was held on 5 December 2019​ following the closing plenary, summarizing key meeting results.

Among other achievements in the reporting period, the membership approved new and revised Recommendations developed by SG12, *including* Recommendations ITU-T

– E.475: Guidelines for intelligent network analytics and diagnostics;

– E.805: Strategies to establish quality regulatory frameworks;

– G.1034: QoE metrics for mobile telephony communication during rail travel;

– G.1072: Opinion model predicting gaming QoE for cloud gaming services;

– P.565: Framework for creation and performance testing of machine learning based models for the assessment of transmission network impact on speech quality for mobile packet-switched voice services;

– P.1150: In-car communication audio specification;

– P.1502: Methodology for QoE testing of digital financial services;

– Y.1540: Internet protocol data communication service - IP packet transfer and availability performance parameters.

New Recommendation ITU-T E.805 on strategies to establish quality regulatory frameworks is addressing WTSA Resolution 95, ITU Telecommunication Standardization Sector initiatives to raise awareness on best practices and policies related to service quality. Several other related work items are nearing completion.

Following over 20 years as an in-force Recommendation, the 2019 Edition of Recommendation ITU-T Y.1540 Internet protocol data communication service – IP packet transfer and availability performance parameters recognizes many changes in the design of IP services and in the protocols employed by end-users.

Addressing the mandate of WTSA Resolution 89 on promoting the use of information and communication technologies to bridge the financial inclusion gap, new Recommendation ITU-T P.1502 introduces a methodology for testing QoE of digital financial services (DFS).

Machine learning has become a widely used tool in the context of developing speech, audio and video quality assessment models.

Examples of new Recommendations benefitting from this tool include the ITU-T P.1204 series (Video quality assessment of streaming services over reliable transport for resolutions up to 4K); ITU-T P.565 (framework for creation and performance testing of machine learning based models for the assessment of transmission network impact on speech quality for mobile packet-switched voice services); and ITU-T E.475 (guidelines for intelligent network analytics and diagnostics), all approved in January 2020.

Some of the lessons learned in the development of the above Recommendations will be presented in the form of a technical report (TR-ML) and a supplement (Suppl.ML) describing considerations on the use of algorithms based on machine learning for QoS and QoE purposes.

## Lead study group on driver distraction and voice aspects of car communications

Q4/12 on objective methods for speech and audio evaluation in vehicles completed work on a new Recommendation, ITU-T P.1150, describing transmission characteristics for in car communication (ICC) and introducing related test methods.

SG12 is liaising with the Focus Group on Vehicular Multimedia.

## Lead study group on quality assessment of video communications and applications

SG12 achieved an important milestone in the completion of four new Recommendations in the P.1204 series covering video quality assessment of streaming services over reliable transport for resolutions up to 4K.

Undertaken jointly with the Video Quality Expert Group (VQEG), this project will yield in two additional Recommendations, targeting completion in April 2020.

Other work on quality assessment of video communications and applications in the reporting timeframe includes new Recommendation ITU-T P.918 on dimension-based subjective quality evaluation for video content, and new Recommendation ITU-T G.1072 proposing an opinion model predicting gaming QoE for cloud video gaming services.

SG12 launched a call for participation for the development of a computational model to assess QoS and QoE of videotelephony services (TSB Circular 223), and is contributing to the Intersector Rapporteur Group on Audiovisual Quality Assessment (IRG-AVQA), convened alongside the VQEG meeting in March 2020 in Seattle, Washington, USA.

A table covering important elements of the work on this topic is made available in Annex.

**Annex: Recommendations and Work Items quality assessment of video communications and applications**

|  | **Recommendation**  | **Title** | **Summary** |
| --- | --- | --- | --- |
| Factors or measurement parameters | G.1010 | End-user multimedia QoS categories | This Recommendation defines a model for multimedia QoS categories from anend-user viewpoint. By considering user expectations for a range of multimedia applications, eightdistinct categories are identified, based on tolerance to information loss and delay.  |
| G.1028.1 | End-to-end QoS for video telephony over 4G mobile networks |  |
| G.1032 | Influence factors on gaming QoE | This Recommendation describes the QoE factors of video gaming. |
| G.1080 | QoE requirements for IPTV services | This Recommendation defines user requirements for QoE for IPTV services. |
| G.QoE-VR(ongoing) | Influencing factors on QoE for virtual reality (VR) services |  |
| G.QoE-AR(ongoing) | QoE factors of augmented reality (AR) |  |
| G.MDKT(ongoing) | Methodology for determining QoE-relevant KPI thresholds | This Recommendation will provide a methodology for selecting QoE-relevant KPIs (e.g., throughput) as independent variables and the per-session MOS predicted with a QoE model as a dependent variable |
| Planning models | G.1070 | Opinion model for video-telephony applications | This Recommendation defines an algorithm that estimates videophone quality for QoE/QoS planners. This model can be used by QoE/QoS planners to help ensure that users will be satisfied with end-to-end service quality.  |
| G.1071 | Opinion model for network planning of video and audio streaming applications | This Recommendation provides algorithmic models for network planning of video and audio quality of IP-based video services.  |
| G.1072 | Opinion model predicting gaming QoE for cloud gaming services |  |
| G.QUIT(ongoing) | Objective model for assessing impact of initial loading delay on user experience |  |
| Monitoring models | P.1201 (PNAMS) | Parametric non-intrusive assessment of audiovisual media streaming quality | This Recommendation provides an algorithmic model for non-intrusive monitoring of the audio, video and audiovisual quality of IP-based video services based on packet-header information. Video resolution should be HD or below. |
| P.1203 (PNATS) | Parametric bitstream-based quality assessment of progressive download and adaptive audiovisual streaming services over reliable transport | This Recommendation provides model algorithms for monitoring the integral media session quality for TCP-type video streaming. Supported video resolution should be HD or below. |
| P.1204 (PNATS-PH2) | Video quality assessment of streaming services over reliable transport for resolutions up to 4K | This work extends P.1203 to UHD, and also includes pixel-based and hybrid model types. |
| P.NAMS-PH2(ongoing in Q14) | Parametric Non-intrusive Bitstream Assessment for High Efficiency Video Coding (HEVC) and 4K Media Streaming Quality over UDP | This work extends P.1201 to UHD. |

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