



Innovative R&D by NTT

QoE measurement in the field

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- QoE measurement in the field:
 - What we can get when measuring QoE in the field, and what we need to care about



- Working at several fields regarding “quality”
 - Network measurement (fixed & mobile)
 - application performance measurement
 - **QoE measurement (video, speech, etc.)**

Wording of “QoE”



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The word “QoE” here means the rating actually scored by humans(subjects).

- KPI: performance parameters(often network level; L3/L4)
- KQI: application performance(eg. Video playback waiting time, video freeze rate, etc.)
- **QoE: Mean opinion score(MOS; scores taken from multiple subjects)**
- Engagement: a satisfaction and/or resulting action coming from a long term impression

Ordinary QoE measurement



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Example of a video quality evaluation

1. Show a degraded video sample to subjects
2. Each subjects answer a score
3. Do 1.&2. with many video samples with separate degrade level, with random order.

The score is **relatively decided** between the samples shown to each subjects.

In general, it is a **perception test** of if the effect of degrade is recognizable, rather than being a satisfaction test.

- The experiment is design to separate each subject's experience bias, and intend to purely focus on "perception".



- In the “field QoE measurement”, the QoE measurement itself would be somewhat different from ordinary QoE measurement.
- Each subjects will be shown “one sample only” for each test, so he needs to decide the score solely from the sample. Thus the score would be more **direct/absolute**, compared to the ordinary QoE measurement.
- In this way, this experiment’s result may be more “satisfaction” test, compared to ordinary testing.

QoE measurement outside the lab env.



- A cognitive psychology aspect may need to be considered.
Example:
 - Adaptation effect
 - A happiness level is often saturated by usual experience. (the happiness brought by some happy things often gets “worn out”)
 - Anchoring and adjustment heuristics
 - An answer is affected largely by the numbers seen directly before the test.

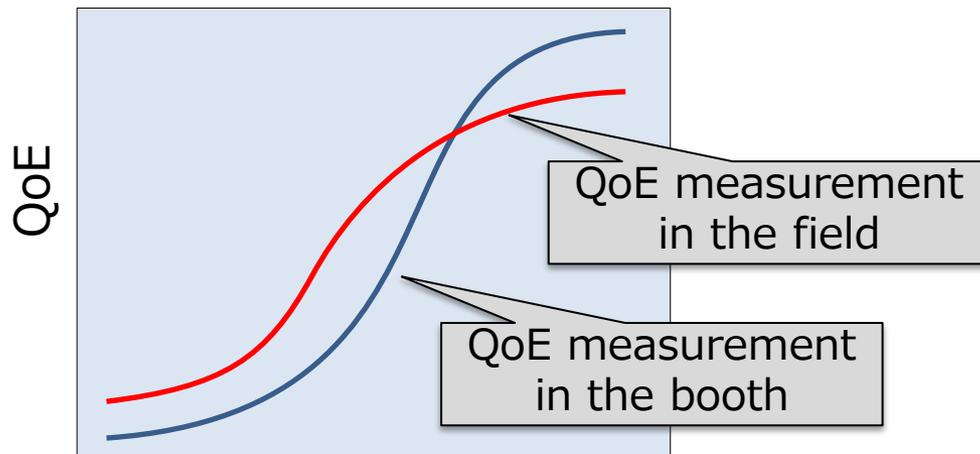
	Pros	Cons
Booth env. Ordinary testing	<ul style="list-style-type: none">• Controllable media quality.• Fits well for precise “media quality” evaluation	<ul style="list-style-type: none">• Different from “usual environment”• Hard to decide satisfaction or “like”ness
Home/office etc. Field measurement	<ul style="list-style-type: none">• Quality evaluation decision done in the usual/familiar environment	<ul style="list-style-type: none">• Media quality is hard to control• Large sample deviation expected

Expected difference of QoE result



- The QoE degrade sensitivity may be different from the booth environment?
 - Do subjects care the same level compared with when he/she watches the video in the booth?

Expected result(image)



Video KQI

Example: Bitrate, loss rate, buffer empty events,...

- QoE range may be different (upper and lower limit)
- Distribution may be different