BP-3: Beyond QoS/QoE -toward a prospective conceptual framework of communication quality

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Foreword

This is a special report of seven panel discussions sponsored by Communications Society in 2008 IEICE General Conference held in Kitakyusyu-shi, Japan in this March.

Hot topics related to advanced communication technologies were extensively discussed by the experts together with the participants to explore not only the future of communications technologies but also the deployment of new systems and services.

1. Introduction

At the IEICE Society Conference, Kitakyushu Science and Research Park, 18-21/3/2008, the technical committee on CQ(Communication Quality) organized the panel session "BP-3 Beyond QoS/QoE -toward a prospective conceptual framework of communication quality-".

The purpose of this session is to discuss "quality" concepts from viewpoints standing on psychology or brain science. This session is organized in two parts, invited talks and panel discussion.

2. Background

QoS(Quality of Service: ITU-T E.800) of the network system including a part of the end is pursued for not only telecommunication, but also transmission and reproduction of music, images, movies, and so on. Recently, QoE(Quality of Experience) as a perceptual and subjective overall acceptability by the end-user is pursued (Appendix I to P.10/G.100, ITU-T SG12). However, the contribution of the improvement of the quality to the user satisfaction decreases rapidly compared with the increase of the development cost when the quality exceeds a constant level. There is a user when he or she certainly requests "High quality" from contents and service. However, it might be more important that an individual user acquire different, subjective, and positive inner value from those, for example, impression, comfort, relaxation, satisfaction, accomplishment, and so on.

In this session, we want to discuss the future frame of the quality concept by standing further on the user side, while basing QoS and QoE.

3. Invited Talks

The six invited panelists presented their papers in sequence in the first part. The presentation time was limited at 10 minutes a person, so questions and supplementary explanations were done later collectively, at the beginning of the second part of the session.

Firstly, two panelists presented their studies from the view point of temporal perception of speech (or music) and listener's satisfaction or appreciation.

BP-3-1 Suggestions from the Psychological Study of "Ma"
Toshie Nakamura (Osaka University)
BP-3-2 Suggestion from Speech Rate Conversion Researches
Atsushi Imai (NHK STRL)

Dr.Nakamura lectured about "Ma", which is the Japanese word about the temporal space of speech or musical performance. "Ma" means not only physical fixed time length but also psychological fluctuant margin, and it is very important for listeners to for appreciation, synchronization, comfort, and so on. Dr.Imai lectured about Speech Rate Conversion. This technology is developed to slow down rapid speech, especially for elderly listeners. Slowing down speech speed equally is not good enough by itself, but combination with optimized reducing pause interval is effective.

Secondly, two panelists presented studies about feelings of comfortable and harmony from the view points of daily life and audio-visual interaction.

BP-3-3 Suggestion from researches of comfortable/pleasant feelings
Rie Monchi-Semba (Kao Corporation)
BP-3-4 Role of Sounds in Visual Productions
Shin-ichiro Iwamiya (Kyushu University)

Dr.Monch-Semba introduced an idea of comfortable feelings in daily life and her work on development of inquiry scales including 16 of emotional factors. Dr.Iwamiya presented that audio-visual structural and semantic interaction resulted in various impressions: emphasis on or reduction in visual effects, increasing or decreasing a sense of harmonious or congruous, and so on.

Thirdly, two panelists gave presentations on brain scientific approach on "presence"(realistic sensation) and implicit brain function approach on communication.

BP-3-5 Perceptual and Cognitive Mechanisms and Evaluation Methods of "Presence"
Hiroshi Ando (NICT / ATR)

BP-3-6 From the Viewpoint of Implicit Brain
    Function
 Makio Kashino (NTT / ERATO SHIMOJO
Implicit Brain Function Project)

Dr.Ando lectured about the concept of "Presence", showed a psychophysical evaluation study on a texture of CG objects on 3D-dysplay and an fMRI study on natural or unnatural images, and mentioned how we should develop on evaluation method for a sense of "presence". Dr.Kashino lectured the dynamic characteristics of our perception and preference, and showed some interesting studies; the information contradicted to prediction disturbs our perceptual completion, for example. He emphasized necessities of construction of computation model and measurement for implicit brain process of dynamic sensory-motor-emotional communication.

4. Panel Discussion

In the second part of our panel session, we wanted to discuss and search for the quality concept that should be considered next to QoS and QoE through the models, the findings, and the methodology in non-telecommunication fields presented in the previous part. The contents were as bellow;

 (1) Technical questions to each panel presentation.
 (2) Supplementary explanations by invited panelists.
 (3) Approaches to 'kansei' (sensibility) and 'kando' (impression);
    - How and why do they cause in us?
    - How can we address them?
 (4) Progress or improvement of "quality";
    - Is it contributes user's happiness or welfare
       at any time?
    - How can we bring qualities and costs
       into balance?
 (5) Beyond QoS/QoE;
    - How should we consider the next concept of
       "quality" of telecommunication(or network)?

5. Conclusion

Each invited paper was interesting respectively as the different aspect related to essence of communication and perceptual senses including "sixth sense" and any more sensibilities. We focused on experiences of user, especially inner value of what he/she accepts, not just perceptual physical quality, though we had insufficient time to deepen the discussion more among the panelists and the floor. Finally, the organizer figured the concept of "Beyond QoS/QoE" for a summary of the session as bellow, which might help us to get a well-focused and in-depth perspective on communication quality.
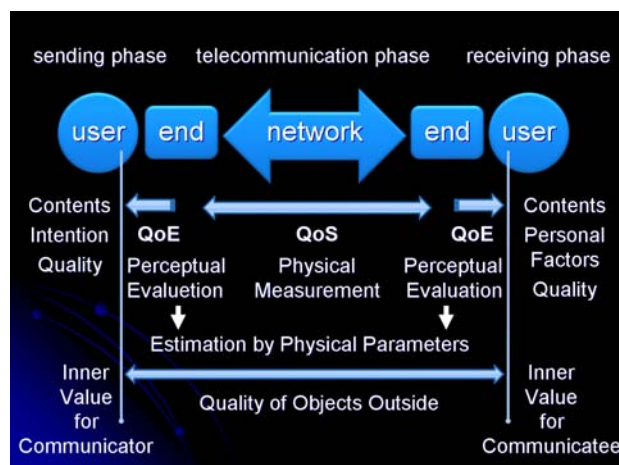

Fig. 1: The concept of "Beyond QoS/QoE"

Organizer of the Panel

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