

ITU-T SG2 국내기고서

ITU-Telecommunication Standardization Sector

Study Group 2

Delayed Contribution No. D.

Geneva, 22-31 March 1994

Document addressed to : WP2

Questions : 2/2, 8/2

Source : Republic of KOREA

Title : G3 팩시밀리 화상품질 측정에 있어서 모집단에 관한 제안

요 약 :

ITU-TS 시험도표 No.2를 실제 선로에서 전송하고, 그들의 T.21 권고에 따라 작성된 설문지를 이용하여 공중교환 전화망과 접속되는 G3팩시밀리의 화상품질을 측정할 수 있다. 본 기고서에서는 정확한 화상품질을 측정하기 위해 전자통신 분야에 대한 지식이 없는 비전문가 그룹을 모집단으로 사용해야 한다고 제안하였다.

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Title : Who should be the population in measuring the image quality of G3 facsimile?

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ABSTRACT

To measure the image quality of G3 facsimile in PSTN, it is one of measuring methods that ITU-TS Test Chart No. 2s are transmitted in real transmission line, and evaluated by facsimile users answering a questionnaire. Not to overestimate the image quality, it is suggested in this contribution that the population should be non-experts who has no knowledge of telecommunication.

1. Introduction

A ITU-TS Test Chart No. 2 can be used to measure the image quality of G3 facsimile in PSTN (Public Switched Telephone Network). Then, it may be more accurate to measure FER(Frame Error Ratio) occurred in document transmission. But it has some technical difficulties including the fact that FER doesn't directly affect the image quality, which was discussed in [1]. Moreover, it is worth measuring the image quality that G3 facsimile users feel when to use it.

Sampled facsimile users answer a questionnaire which is made conforming to ITU-TS Recommendation T.21, and their subjective evaluations on the image quality of transmitted charts are collected. In this contribution, MOS(Mean Opinion Score) method is used to quantify their subjective evaluations. In sampling of facsimile users, it is most important how to define the population to measure properly the image quality, which is the principal proposal in this contribution.

II . Discussion

ITU-TS Test Chart No. 2s are transmitted in PSTN as follows: In Korea, there are less than and equal to 4 links in the facsimile transmission unless detour routes are used. And from 9 a.m. to 12 p.m. and from 6 p.m. to 9 p.m. are considered line busy hours, and the others are non-busy hours. Therefore, four levels for links and two levels for split time zones can make eight combinations. According to the combinations, some cities in Korea are selected and ITU-TS Test Chart No. 2s are transmitted in their transmission line for a week. Collected Test Charts are evaluated by sampled

facsimile users answering a questionnaire which is mode conforming to ITU-TS Recommendation T.21. Each question item in the questionnaire have five category scaled examples from score 5 to score 1 like “excellent”, “good”, “fair”, “foor”, and “bad”.

Two populations are considered for sampling of facsimile users. One is the expert population who are working in the area of telecommunication. The other is the non-expert population who are not related to the telecommunication field. Even there are many question items asked in a questionnaire, the opinion score on the overall impression is analyzed in this contribution, whose validity was showed by Kwon [3].

From the result of analysis of variance, there is highly significant difference in the evaluation of image quality between experts and non-experts, which can be obviously expected in Figure 1.

Kwon [4] suggested the derivation of cumulative perecent curve to see the image quality as follows: Score histograms of the combinations is approximated by normal density curves. The percent curves of each score is derived by the adjusted means and overall variance of normal density curves and cumulated as seen in Figure 2. And sample overall mean opinion score is 3.64 for experts and 3.15 for non-experts. Therefore, just above 90% of experts is considering the image quality of G3 facsimile in PSTN “fair, good, or excellent”. But about 80% of non-experts is evaluating the image quality as “fair, good, or excellent”.

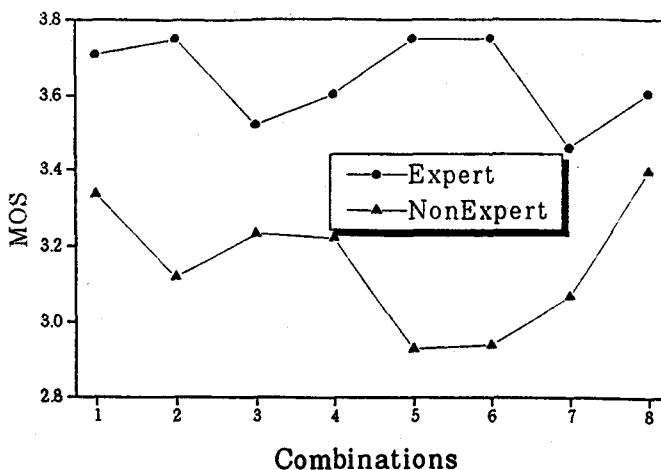


Figure 1. Mean opinion scores

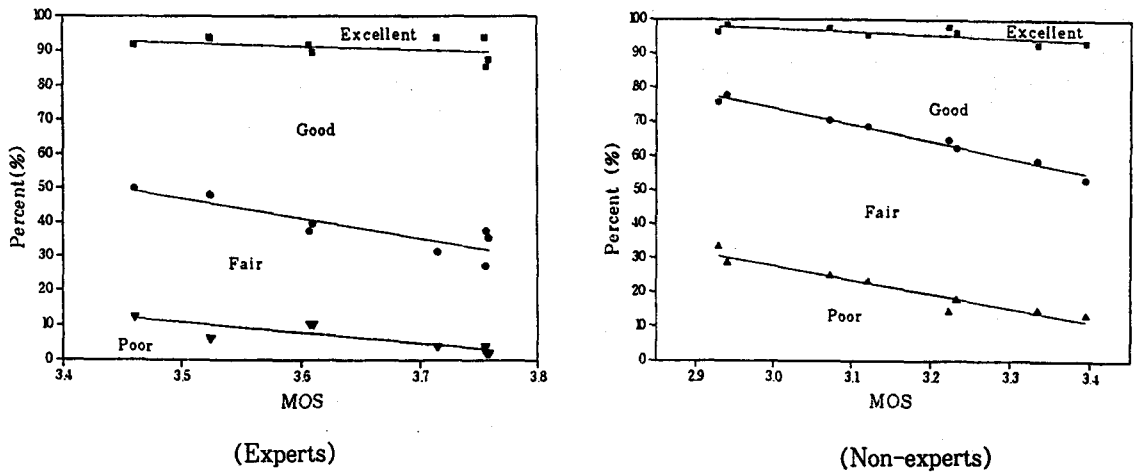


Figure 2. Cumulative Percent Curve

III. Proposal

Experts have somewhat knowledge of facsimile hardware. So they can be general in some degree to difficulties of readability, irregularity of lines, defects of homogeneity, and so on. That may be the reason why experts evaluate the image quality higher than non-experts on the average. Therefore, it is suggested in this contribution that the population for sampling should be non-experts who have almost no knowledge of telecommunication for measuring correctly the image quality of G3 facsimile without overestimation.

References

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