

All drawings appearing in this Recommendation have been done in Autocad.

Recommendation E.810

MODEL FOR THE SERVEABILITY PERFORMANCE ON A BASIC CALL IN THE TELEPHONE NETWORK¹⁾

Introduction

This Recommendation²⁾ is one of a set of closely related Recommendations concerned with the accessibility and retainability of telephone services, as listed below.

considering

(a) that there is a desire to establish overall objectives for the quality of service as perceived by the users;

(b) that such objectives can then be used as a basis for the design, planning, operation and maintenance of telecommunication networks and their component parts;

(c) that Recommendation E.800 contains terms and definitions for the quality of service, the reliability and availability performances and related characteristics of services and networks,

recommends

that the telephone call model given in this Recommendation shall be used by Administrations to design, plan, operate and maintain their networks taking into account the objectives given in Recommendations:

E.830 Models for the allocation of international telephone connection retainability, accessibility and integrity;

E.845 Connection accessibility objective for the international telephone service;

E.850

Note – Refer also to the draft Recommendation on interruption objectives which is being studied under Question 39/II.

1)

Although this Recommendation deals with the telephone service, in principle the model and the decomposition of serveability performance can also be applied to other telecommunication services. The elaboration of this principle is left for further study.

2)

Some of the terms in this Recommendation, for example the noun “measure”, are used in the sense of their definition given in Recommendation E.800.

1 Model of a basic telephone call and its serviceability performance

The following simplified model illustrates the principal phases of a basic telephone call. It also interrelates these phases to the service-related performance concepts and their principal measures as well as to the main causes of failure in the establishment and retention of such a call and its subsequent billing.

The model also indicates where, in this series of phases, user actions or mistakes may influence the call.

2 Comments to the model and its applications

2.1 Mathematical modelling

In a simple case of statistical independence, the probabilities may be combined into the following mathematical models:

$$P = (P_{11} \cdot P_{12}) \cdot P_2 \cdot (P_{31} \cdot P_{32}) \cdot P_4$$

to express the probability of a correctly billed revenue-making call and,

$$P = (P_{11} \cdot P_{12}) \cdot P_2 \cdot (P_{31} \cdot P_{32})$$

to express the probability of a successfully completed call.

2.2 Contributions to causes of call failure

It is generally recognized that the various parts of a national or international network may be of different importance to the successful completion of the various phases of a call. For example, the network accessibility is mainly determined by the telephone set, the subscriber line and the local exchange; the connection accessibility by the exchanges, transmission network and signalling network used; the billing integrity is dependent on the charging facilities used by the network parts that constitute the connection and the equipment for processing the billing information, etc. In some Administrations, the telephone set is not considered as a part of the network and in that case it is not included in the concept of network performance.

2.3 Time aspects of measures

Depending on the intended application of the measures indicated in Figure 1/E.810, it may be appropriate to express these measures as instantaneous values related to a given instant of time or as a mean over a given time interval.

Advice on which variant to use should be given in each specific relevant Recommendation.

2.4 *Space aspects of averages*

The measures as indicated in Figure 1/E.810 could be applied to calls between particular destinations as traffic weighted averages over a number of destinations, etc.

Each relevant Recommendation should clearly specify which alternative(s) to use.

FIGURE 1/E.810 - T0200373-88