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THE INTERNATIONAL
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E.711

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**TELEPHONE NETWORK AND ISDN
QUALITY OF SERVICE,
NETWORK MANAGEMENT AND TRAFFIC
ENGINEERING**

USER DEMAND MODELLING



Recommendation E.711



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FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation E.711 was revised by Study Group II and was approved under the Resolution No. 2 procedure on the 30th October 1992.

CCITT NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized private operating agency.

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Recommendation E.711**USER DEMAND MODELLING***(revised 1992)***1 Introduction**

ISDN users have various needs for information transfer. The user demand, as manifested in the user/CPE interface [see figure 1a)/E.711], is characterized by an arrival process and by a call duration and/or a quantity of information attached to each arrival.

Through the mediation of the Customer Premises Equipments (CPEs), user demands are translated into call demands for specific telecommunication services in the user-network interface. These call demands are modelled in this Recommendation to allow the characterization of the traffic offered to the layers 1 to 3 of the ISDN.

Based on the call demand modelling, users will be characterized by the generating process of their originating and terminating call demands.

2 Modelling of a call demand**2.1 General**

The traffic offered to the layers 1 to 3 at the user-network interface is modelled by the call demand [see Figure 1b)/E.711]. For traffic engineering purposes, a call demand is defined by a set of connection characteristics and by a call pattern:

- The connection characteristics are described by the values of certain attributes given by Recommendation I.210. Only some of the low layer and general attributes are significant. The values of each attribute can be:
 - selected by the user;
 - prescribed by the service provider;
 - negotiated between them.

This set of attributes must be sufficient to identify precisely the resources needed by the call demand in the network, both in the user and control planes.

- The call pattern of a call demand is described in terms of sequences of events at the user-network interface and of the times between events.

The call pattern, associated with the connection characteristics, must be sufficient to quantify the traffic offered to the network resources by the call demand, in the user plane and in the control plane.

2.2 Connection characteristics

As mentioned in § 2.1, the connection characteristics of a call demand are defined by a set of low layer and general attribute values, defined in Recommendation I.210, which are significant for traffic engineering. The low layer attributes are:

- information transfer mode;
- information transfer rate;
- information transfer capability;

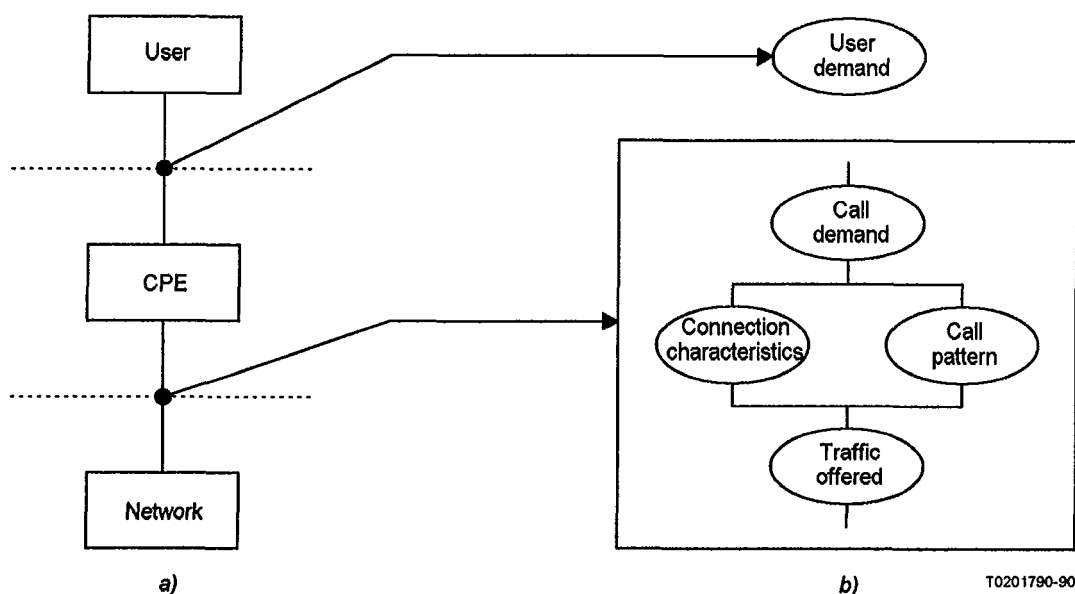


FIGURE 1/E.711

User demand modelling by call demands

- establishment of communication;
- symmetry;
- communication configuration;
- access channel and rate;
- signalling access protocol layers 1 to 3;
- information access protocol layers 1 to 3.

Among the general attributes, which are still under study, the attribute "Supplementary services" is of particular significance for traffic engineering. The list of other traffic significant general attributes is for further study.

In practice, when the connection characterization is made for a specific traffic engineering task, only some of the above-mentioned attributes are significant.

On the other hand, some of the values of the attributes given in the I-Series Recommendations are not sufficient for traffic engineering purposes. As an example, the defined values of the communication configuration attributes are point-to-point, multipoint and broadcast. For traffic engineering purposes, the number and position of the points and the identification of the originating and terminating points have to be specified as well.

The definition of other connection characteristics significant from the traffic engineering point of view is for further study.

Note – High layer attributes, such as high layer protocols, are not considered as connection characteristics since, from the viewpoint of traffic offered to layers 1 to 3 of the ISDN, high layer protocol messages should be considered as user information and thus modelled by means of the call pattern.

2.3 *Call pattern and traffic variables*

As mentioned in § 2.1, the call pattern of a call demand is defined in terms of sequences of events at the user-network interface and of the times between events.