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OPERATIONS AND QUALITY OF SERVICE
AUDIOVISUAL SERVICE

AUDIOVISUAL INTERACTIVE SERVICES

ITU-T Recommendation F.740

(Previously "CCITT Recommendation")

FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). The ITU-T 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 World Telecommunication Standardization Conference (WTSC), which meets every four years, etablishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation F.740 was prepared by ITU-T Study Group 1 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 31st of August 1993.

NOTE

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

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Recommendation F.740

AUDIOVISUAL INTERACTIVE SERVICES

(Geneva, 1993)

The ITU-T,

considering

(a) the existing (draft) documents on Audiovisual Interactive systems and protocols in SG 8;

(b) the state of the art of standardization of multimedia and hypermedia information in ISO;

(c) the need for handling audiovisual information of various types, namely text, graphics, still images and moving pictures on telecommunication networks;

(d) the need of having this audiovisual information shared by a various range of users supplying, managing or retrieving applications controlling it, and thus, using a wide and complex range of functions;

(e) that users are justified to demand an acceptable minimum quality of service;

(f) the current setting up of both pilot and operational AVI Services in the fields of education, marketing help, entertainment, etc.,

adopts

the subsequent Recommendation dealing with the General Description for Audiovisual Interactive Service (AVIS).

1 Introduction

The purpose of this Recommendation is to define and describe, from the user's point of view, the general features and attributes of the AVI Service, regardless of the network environment where the service might be provided.

2 Definition of the AVI Service

An AVI Service is a service which provides, through appropriate access by standardized procedures, users of terminals or workstations with information which consists of various input and output presentation elements, possibly combined, such as:

- texts;
- graphics;
- pictures;
- audio sequences;
- video sequences.

A range of functions may be supplied to the user such as:

- simple retrieval;
- interactive consultation;
- re-arrangement of the assembling of elements;
- modification of the elements themselves.

The AVI Service also covers other service aspects related to the creation and management of the information.

It is considered that the operation requires the participation of a number of organizations. The whole set of functionalities offered by the AVI Service is usually carried out via telecommunications networks.

The AVI Service is essentially an asymmetrical service in which a single service provider is providing the service to several users. Additionally, rerouting from one service provider to another one may be offered.

The users of an AVI Service may be equipped with an heterogeneous set of terminals or workstations.

3 Description of the AVI Service

3.1 AVI general aspects

Several types of users will be allowed to access the AVI Service. Different rights should be given to them. As an example, an author will need to make use of enhanced functions given by his AVI terminal operating system and allowing him the access to remote systems when necessary via telecommunication networks whereas a simple retriever will remain more passive and simply need to consult the contents proposed by the AVI application.

The information life cycle varies according to the type of application and can have different values on a scale from short to long.

Three entities need to exchange information. Therefore, to set up an AVI application, telecommunications will be used.

3.2 The main roles

The AVI Service provides with facilities to fulfil the requirements of the users involved in creating, exchanging, modifying, managing and executing AVI applications.

The users of the AVI Service may have several roles:

- author;
- information manager;
- preparer;
- retriever,

dealing with the following families of functions:

- editing functions;
- information management functions;
- execution and retrieval functions.

According to the users' needs, various and numerous exchanges will be set up between systems or subsystems providing with the functions.

An AVI Service can be illustrated as in the Figure:

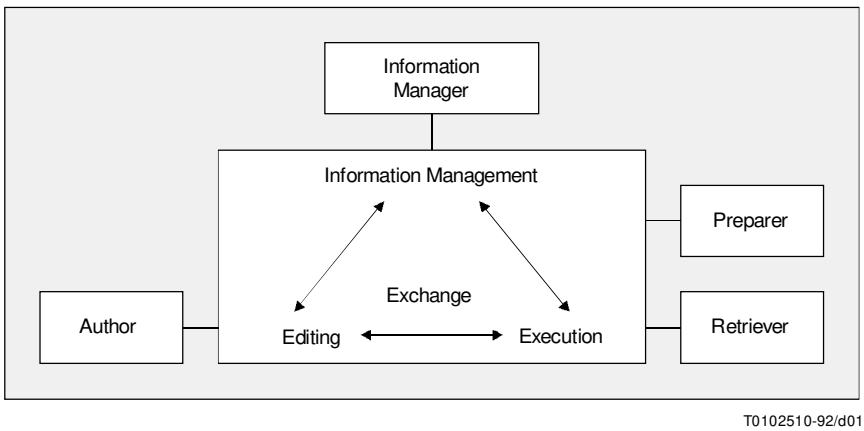


FIGURE 1/F.740

An AVI service

3.3 Their functional needs

Each of the various roles has specific functional requirements with regards to the first three families of functions identified i.e. editing, information management, execution.

As the respective locations of entities assuring roles and systems supplying functions may be distant, exchange functions should be activated as well.

Table 1 hereafter, breaks down the needs of the four categories of roles according to the three families of functions.

TABLE 1/F.740

Roles versus functional requirements

Functions			
Roles	Editing	Information Management	Execution
Author	– AVI creation or updating – Creation of the catalogue for AVIs already edited – Modification of AVIs already edited – Validation and transmission to information management system – Concatenation of AVIs already edited	– Management of edited AVIs and updates – Usage follow-up, trace processing – Statistics and payment	– Debugging of AVIs – Experimentation using a sample user group
Information Manager	– Consultation of catalogues of AVIs already edited – Transmission to information management of AVIs already edited or their updates	– Creation and maintenance of catalogue for AVIs ready for management – Storage of AVIs and updates – Implementation of a pricing policy – Delivery management (profile verification) – Retriever and preparer management (access control, billing, …)	– Collection of execution traces and recovery context
Preparer		– Choice of AVIs already managed – Negotiation of configuration, parameters and installation on real supports as required – Sending of retriever usage follow-up	– Reception and installation of AVIs and updates – Verification of correct installation – Collection of traces generated by AVIs
Retriever		– Choice of AVIs already managed – Usage follow-up – Recovery management	– Choice of AVIs already installed – Recovery management (Note) – AVI usage
NOTE – A retriever may recover an AVI, later after its interruption, in the same context of usage. Two concrete examples of AVI applications are given in Annex A.			

3.4 Terminal aspects

Terminal equipment needs to provide with a set of functions such as:

- display of text, graphics, still images preferably in colour and optionally moving images;
- reproduction of sound;
- acquisition of user interactions.

All these functions should make use of appropriate standards defined or being defined in ISO IEC/JTC 1 and ITU-T.

Terminals will be connected to appropriate networks by making use of interfaces and protocols defined in ITU-T.

Terminals are equipped with a minimum set of items, namely a keypad, mouse, monitor and loudspeaker.

3.5 Terms and definitions

3.5.1 Specific terminology

For the purpose of this Recommendation, the following definitions apply:

role: The role is either a person who activates, or a process which has been designed by a person in order to activate a functionality of an AVI application.

retriever: The role who mainly consults the application by interacting with the presentation process.

preparer: The role who mainly selects, installs, personalizes and concatenates the applications as well as following up their execution.

information manager: The role who mainly defines or modifies user access authorization and tariffing, then provides the execution process with the applications to be executed or their updates.

author: The role who mainly creates and validates applications or updates and supplies them to the information manager for their distribution.

editing: Creation of applications, including design, use of media, development, verification, modification, updating and validation before the applications become available to the users.

information management: Application management, including storage, classification, catalogue creation and management, retriever and preparer management, tarification, monitoring usage processing, context recovery management, etc.

execution: Application usage after installation, user interface management, monitoring usage implementation and, where appropriate, upstream connection with an information management system or directly with an editing system in case of an implementation in progress.

AVI application: An AVI application is a dedicated use of the AVI Service to satisfy a particular requirement. An AVI application contains at least structural and presentation elements.

The presentation elements are either input or output objects of various nature. They may be of monomedia, multimedia or hypermedia type.

The execution of an AVI application consists in activating scriptware transferred as part of the application and forming its structural elements. These scriptware may perform, among others, the following functions:

- references to and links between objects;
- global control of events;
- requests for traces;
- check-points management for navigation and warm-state recovery;
- invocation of external processes and data;
- references to other scriptware;
- response analysis.

AVI terminal: The particular configuration of an AVI terminal will depend on the role which will use it. As an example, an author will make use of a scanner on his AVI terminal whereas a retriever will need to consult one or several contents by simply reproducing them on his AVI terminal.

update: Part of an application which results from the comparison between a given version of an application with a previous one.

3.5.2 Terms and definitions shared with ISO IEC JTC 1/SC 29/WG 12-MHEG

multimedia (representation): The property of handling several types of representation media.

The term multimedia is an adjective, it must be used attached to a noun which helps defining the context; multimedia service or application, multimedia terminal, multimedia network, multimedia presentation.

In the MHEG standard, multimedia is used in the sense of multiple representation media. "Multimedia" starts with two types of representation media in a piece of information and thus a remote processing service or videotex when using only a usual keyboard and a purely textual display cannot be said multimedia as involving only one type of medium (character or text type), although in both directions, to and from the user (the service is interactive, not multimedia).

hypermedia: The ability to access monomedia and multimedia information by interaction with explicit links.

Example – a set of linked photographic pictures with associated sound sequences showing the famous buildings in a given town together with different views of each building; the pictures and sounds will be accessed through navigation along the predefined links within the object.

object: Coded representation of a finite independent self-defined piece of information that can be manipulated as a whole by applications and interchanged as one unit. The information can be of multiple different types: content, projector, basic, generic input, spatio-temporal composite, clock, conditional action set and null.

NOTE – This definition is not restricted to digitally coded objects, there could also be analogue objects such as videodisc sequence.

script: Specification of how one or more objects are to be presented to, or input from a user.

scriptware (script software): Software that realizes a script, including both informative data and associated data about how the information is to be handled/presented.

4 Procedures

It is essential that the access to the service, from the user's point of view, should be offered via a common look-and-feel for any user on any kind of implementation of it.

A guidance, taking the shape of a dialogue between the user and the system operating the application, will offer the user indications and controls information.

5 Charging principles

5.1 General

Depending on the kind of applications offered by the service or the kind of users, namely author, information manager or retriever and general public or professional accessing it, various charging principles should have to be set up.

As an example, a general public user accessing an application offered by the service via a public and unattended equipment should access this service free of charge, whereas an author should subscribe to a private subscribers group and additionally, pay for the retrieval of the available information.

An essential requirement is that charging must correspond to the service offered taking into account the nature of both users and applications accessed by them.

5.2 Networks capabilities for charging

This Recommendation does not cover detailed charging principles which are to be defined in other contexts.

The network should be able to charge for the use of the service on the following basis:

- no charging; or
- pay per call; and/or
- pay per duration; and/or
- pay per volume of transmitted information; and/or
- pay per item.

A combination of these capabilities should be set up.

6 Quality of service

6.1 Network optimization

According to the different application requirements, the service will make use of the most appropriate network configuration.

6.2 Media quality

Different applications will have a wide range of media requirements. As the AVI Service definition is independent of any application, the AVI Service will cover a generic part of them.

6.3 Security

An AVI Service should provide the information owners with a secured environment preventing users from illegal uses of exchanged information.

Security aspects are of three categories:

- protection from external violations during information exchanges;
- protection of AVI applications against use of illegal copies;
- protection of systems themselves against unauthorized use.

7 Interworking and intercommunication requirements

As an AVI Service does not depend on a specific network, interworking requirements have not been taken into account.

Intercommunication with user-to-machine (information-type) services:

The AVI Service may have to intercommunicate with the videotex service in so far as this last one defines terminals operation and access to remote databases for information retrieval purposes.

Intercommunication with user-to-user (conversational-type) services:

Conversational services, namely videotelephony, videoconference and audiographic conference make use of real or non real-time data transfer onto users' terminals.

This facility will be used to allow intercommunication between the AVI Service and so-called conversational ones.

Annex A

(to Recommendation F.740)

Examples of multimedia application

(This annex forms an integral part of this Recommendation)

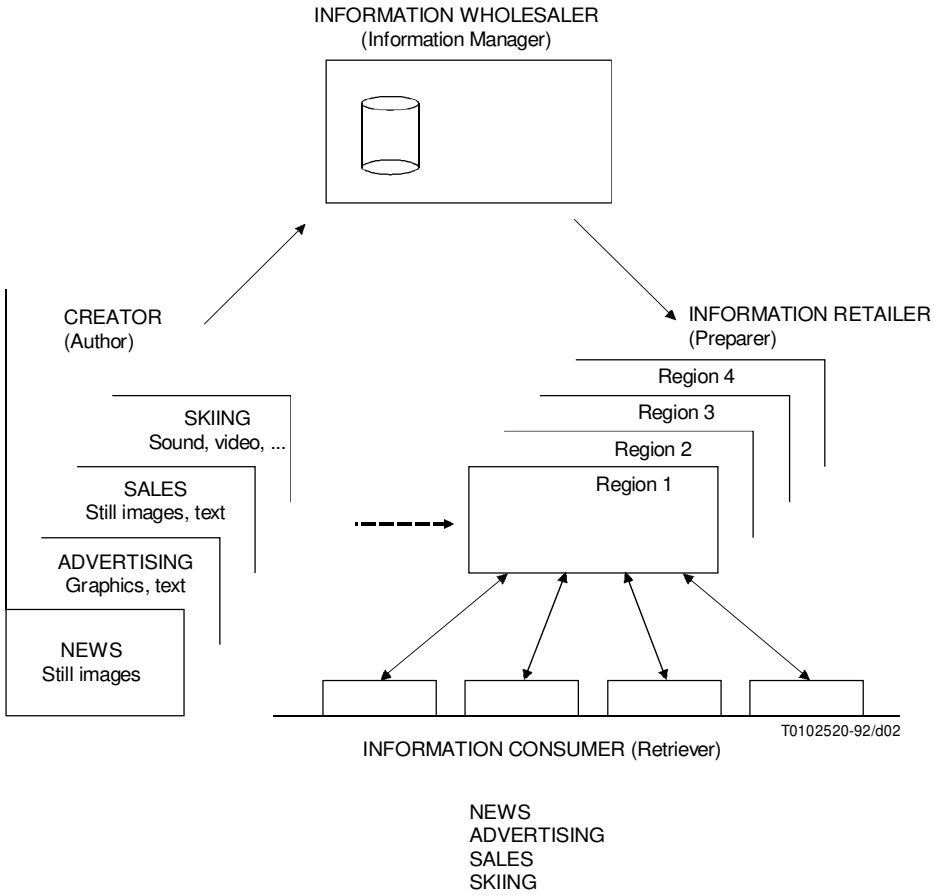
A.1 Introduction

The two following examples show that the AVI Service uses three important entities which have the same role although their respective names are different:

- author, creator and education author;
- information wholesaler and educational publisher;
- information retailer and school system.

The two examples explained in this annex do not intend to be exhaustive, but aim only at showing the need for modelizing an AVI Service.

A.2 Multimedia information booth application



NOTE – Author, information manager, preparer and retriever refer to roles which comply to the description of the AVI Service made in clause 3.

FIGURE A.1/F.740

Multimedia information booth application

A.2.1 General description of the usage

A multimedia information booth service will aim at providing multimedia booths spread throughout and installed in public areas with various kinds of update information such as news, hotel reservations, entertainment, etc. To achieve this, a full range of systems will be used going from the design to collection, distribution and retrieval of information.

Three entities are included in the multimedia information booth service:

- **Creator (or author)** – Building multimedia applications such as news, advertising, sales, skiing;
- **Information wholesaler** – Storing the information and managing them;
- **Information retailer** – Distributing at a regional level the information to consumers.

A.2.2 Characteristics of the multimedia information application

A.2.2.1 Characteristics of a service access

It provides with multi applications for many publicly available multimedia workstations like text, graphics, audio sequences, video sequences, touch screen, etc. The service access is opened 24 hours per day. Its geographic distribution allows to reach consumers in several public places. A consumer may buy things like tickets and therefore, a booth may offer a possibility of paid service. Data access may be done either local or remote. Due to the type of information, the information life cycle is short or very short and there is a high frequency of updating. Retrieval sessions are short. Terminals are installed in public places for public use and consequently they must be robust. A consumer must use the service by himself, and unattended, therefore multilingual aspect improves the service. No skill is required to use this service.

A.2.2.2 Information wholesaler characteristics

He is a professional and commissions new works. He must be a manager and a wholesale dealer in information. He is in charge of maintaining information. He has a "legal responsibility". A skill in database is required.

A.2.2.3 Author characteristics

He is a professional author with a skill level in design and may work on one or more topics. He works in an "office" environment.

A.2.2.4 Information retailer characteristics

He distributes information and therefore a skill in telecommunication is required for him.

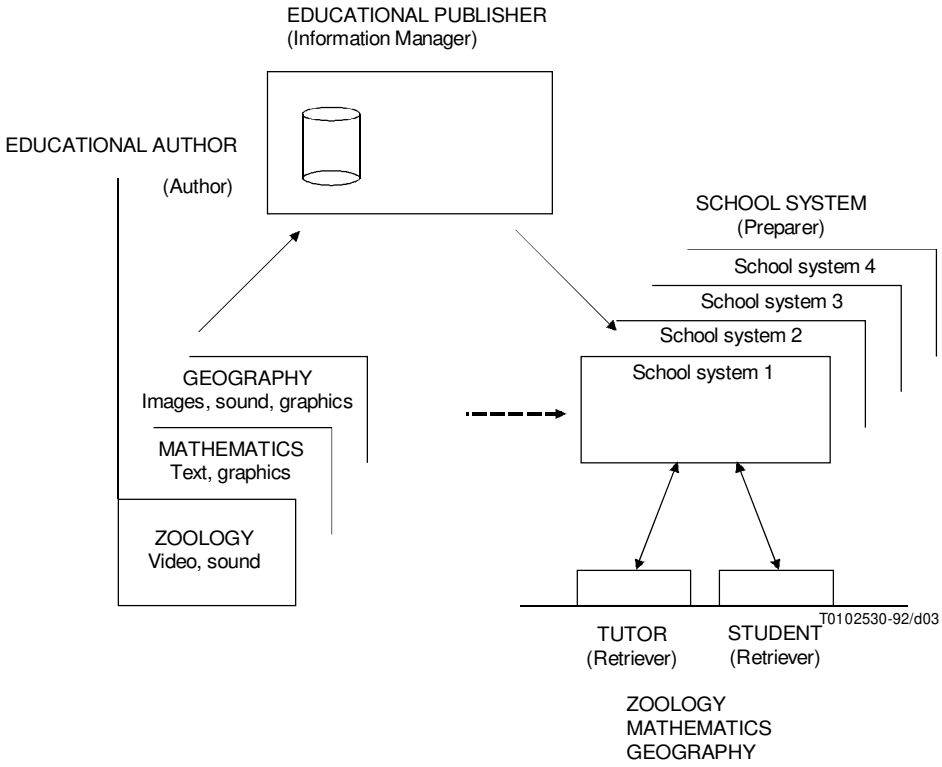
A.3 Educational application

A.3.1 General description of the usage

An educational service is used by schools to acquire and, later on, to distribute educational courses to students and tutors. As in the previous example many entities will intervene in the service.

The educational service is based on three entities:

- education author creates different applications like geography, mathematics, zoology;
- education publisher sends commissions to education author to create applications, stores and manages them;
- school system distributes the different applications to the two types of users: student and tutor.



NOTE – Author, information manager, preparer and retriever refer to roles which comply to the description of the AVI Service made in clause 3.

FIGURE A.2/F.740

Educational application

A.3.2 Characteristics

The two kind of users have some characteristics in common. Particularly, educational materials will be protected against illegal copy and utilization. Both users will see the same types of information: text, graphics, video sequences, audio sequences, etc.

Some characteristics may be different. The tutor uses this system only at his office (during office hours) and students may use it during much more extended hours. The skill to use equipments will be medium for the tutor and basic for the student. The tutor will have a medium skill in using equipment because of his medium level workstation due to the different functionalities. Some tracks will be necessary to follow the student progress, and for the tutor course report (grades). Generally, sessions of use will be long. In case of interruption, it will be important to have a warm state recovery to start a new session at the same state when the user stopped. Other characteristics are involved for only the tutor. Information has a real-time aspect in case of on-line help. Because of the perennity of the educational material the information life cycle will be medium or long. A student may have to pay for this service. A student's terminal is composed of a low cost equipment because of its basic functionalities (only one single connection, may be remote execution...). This aspect is not critical for a tutor.