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SERVICES

Audiovisual services

**Guideline Recommendation for identifying
multimedia service requirements**

ITU-T Recommendation F.701

(Formerly CCITT Recommendation)

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**Guideline Recommendation for identifying
multimedia service requirements**

Summary

This Recommendation provides guidelines for describing user requirements that are to be used as the basis for constructing new multimedia services. These guidelines are primarily intended to support the Multimedia service development methodology described in ITU-T Recommendation F.700. However, they can also be used as the basis for a structured dialogue between End-Users and Service Providers in order to arrive at a responsive service solution when applicable ITU-T service Recommendations are not yet available.

Source

ITU-T Recommendation F.701 was prepared by ITU-T Study Group 16 (2001-2004) and was approved under the World Telecommunication Standardization Assembly Resolution No. 1 procedure on 17 November 2000.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the 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 Assembly (WTSA), which meets every four years, establishes 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 WTSA Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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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As of the date of approval of this Recommendation, the ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Guideline Recommendation for identifying multimedia service requirements

1 Scope

This Recommendation provides guidelines for describing user requirements that are to be used as the basis for constructing new multimedia services. These guidelines are primarily intended to support the Multimedia service development methodology described in ITU-T Recommendation F.700. However, they can also be used as the basis for a structured dialogue between End-Users and Service Providers in order to arrive at a responsive service solution when applicable ITU-T service Recommendations are not yet available.

2 Definitions

For the purpose of this ITU-T Recommendation the terms defined in Recommendation F.700 will apply. The definitions of some important terms are reproduced in Appendix I for user convenience.

3 Multimedia service development methodology

A detailed methodology for developing Multimedia services is described in Recommendation F.700. Figure 1 provides an overview of this methodology and shows how end-user requirements are inserted into the service development process through the use of Application Scripts. The construction of these Scripts from End-User requirements is described in the remaining clauses of this Recommendation.

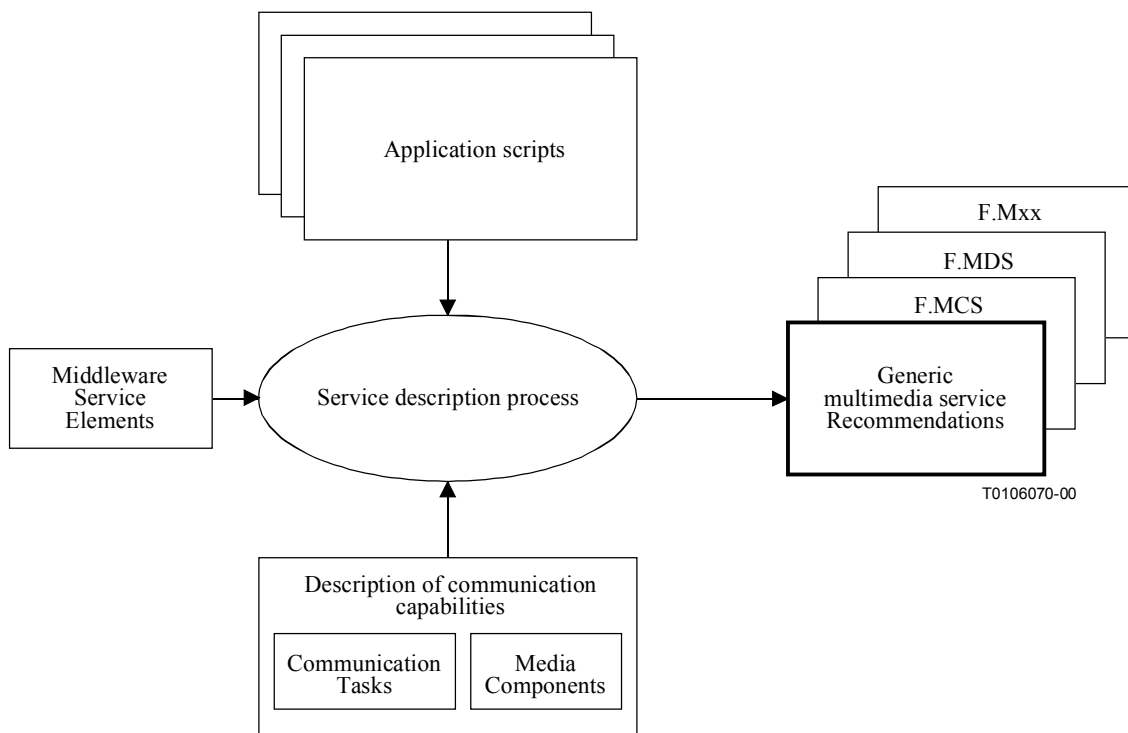


Figure 1/F.701 – Multimedia service development methodology

3.1 Application scripts

An application script is a document that describes the essential characteristics of an End-User application so as to facilitate identification and evaluation of the multimedia communication capabilities required to support it. The script, when properly validated, provides the baseline requirements for new multimedia services. The procedure for developing and validating application scripts is described in clause 4.

3.2 Communication capabilities

Communication capabilities are the fundamental sets of communication tasks, media components and integration mechanisms required to develop the complex spectrum of multimedia services. The procedure for translating the application script into the required communications capabilities is described in ITU-T Recommendation F.700. Procedures are also identified for launching the development of new communications capabilities when required to more fully support emerging user needs.

3.3 Middleware service elements

The middleware service elements contain all the control features and the processing functions associated with the service. They interact with the various communication capabilities in order to control them or to process the user information.

3.4 Multimedia service Recommendations

The translation of a particular application script into a description of the required multimedia service can be accomplished directly from the basic communication capabilities by utilizing the procedures specified in ITU-T Recommendation F.700. However, this process can be simplified in many cases by recognizing that a significant number of end-user applications utilize just a few combinations of multimedia communication means. The methodology for describing these generic service architectures in a series of general ITU-T service Recommendations is also described in ITU-T Recommendation F.700.

4 Application Scripts

4.1 Introduction

An application script describes the essential characteristics of an end-user application in a manner designed to facilitate identification and evaluation of the required multimedia communications support capabilities. This is accomplished by first describing the application from the end user's point of view and then translating this description into a form more useful for technical evaluation. The procedures for constructing an application script are described in 4.2 through 4.4.

Ideally, an application selected for the scripting process should represent a broad grouping of individual end-user applications which have the same essential functional characteristics and for which there appears to be a need for the development of a new multimedia service, service arrangement or enhanced service capability.

Differences between specific applications within this broad grouping can be represented by the specific values assigned to a particular requirement attribute. Examples are shown in 4.4. The procedures for validating the results of the scripting process are described in clause 5.

4.2 Prose description

The prose description of an application provides a comprehensive statement of its scope and functional characteristics, together with the user's expectations for the quality of service. This description is written in a language understandable to the end user, who need not be aware of the technical aspects of the underlying service or supporting communications networks.

The prose description may be augmented by an application scenario and a set of implementation notes which further describe the application, highlighting those aspects which might otherwise remain unclear. A sample prose description, with associated application scenario and implementation notes, is provided in Appendix I.

4.3 Functional model of an application

The functional model provides a pictorial representation of the essential functional elements identified in the prose description. This representation is presented from the perspective of the application, rather than from the supporting service or network, and contains only those elements visible to the end user. Figure 2 provides the functional model for the prose description contained in Appendix II.

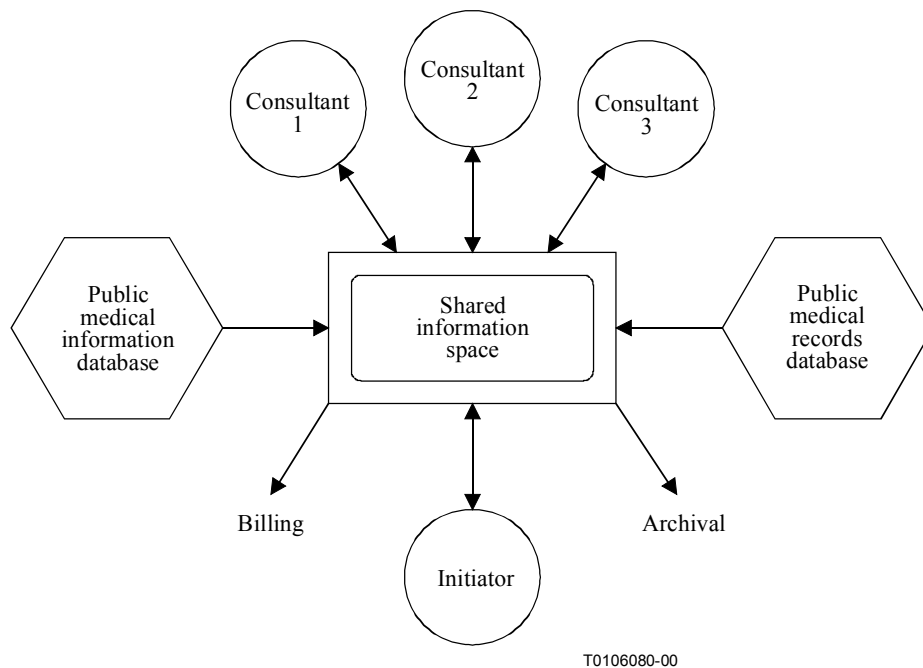


Figure 2/F.701 – A sample functional model of an application (medical consultation)

The principle characteristics to be depicted in the model are:

- the shared information space in which the interaction takes place;
- the functional role of the major participants;
- the required supporting information resources;
- the type and configuration of the various interactions; and
- the need to interface associated application processes.

While there is no standard symbology for constructing the functional model, care should be taken to select a form of presentation that reflects the essential functional elements of the application in a clear and concise way.

4.4 Application matrix

An application matrix maps user requirements onto technical functionalities. The principles for developing attribute tables are the following:

- 1) Application matrices are intended to facilitate the mapping of user needs with technical functionalities in an easily understandable form.
- 2) Application matrices enable the evaluation of service functionalities in a systematic and compact form.
- 3) Application matrices facilitate assessing the importance of functionalities in regard to user needs.

Table 1 shows as an example a part of an application matrix:

Table 1/F.701 – Application matrix template

User needs	Technical functionalities		
	Differential delay between audio and video	Image repetition rate	Image resolution
Lip reading (with head view)	< 100 ms	> 20 pictures/s	QCIF (178 × 144 pixels)
Sign language	–	> 20 pictures/s	CIF (358 × 288 pixels)

The following are examples of user needs:

- discussion of a jointly viewed document;
- the need to move around;
- the need to scrutinize fine details of a presented object.

The following are examples of functionalities the applications may require:

- shared viewing space for images;
- cordless communication access;
- high resolution image transfer.

The development of the matrix requires further study.

4.5 Summary

A script may include a prose description, an application scenario, implementation notes and an application matrix. (or several matrices for different environments or different times in the communication) . Some scripts may contain only part of those elements.

5 Harmonization of Application Scripts with other bodies

Application scripts can be developed by the ITU or by other standards organizations, industry fora, consortia, user groups or individual end users. An application script, before being used as the basis for launching a new service development or evaluation effort by the ITU-T, should be discussed with the end user community if possible or reasonable. This discussion should take place between the relevant study groups and those organizations that have been identified as most representative of relevant end user interests, in accordance with ITU-T policies and procedures (see ITU-T Recommendation A.4).

APPENDIX I

Definitions

Definitions taken from ITU-T Recommendation F.700.

I.1 application: An Application is a set of activities performed to respond to the needs of the users in a given situation for purposes such as business, education, personal communication or entertainment. It implies software and hardware utilization, could be performed in a fully or partially automatic way and could be accessed locally or remotely. In the last case, it requests use of telecommunication services.

I.2 multimedia {MHEG}: The term multimedia is an adjective which means relative to two or more media; it must be attached to a noun which provides the context. For example, multimedia service or application, multimedia terminal, multimedia network and multimedia presentation.

I.3 multimedia application: A Multimedia Application is an application that requests the handling of two or more representation media (information types) simultaneously, which constitute a common information space. Examples are cooperative document editing, long distance meetings, remote surveillance, medical document remote analysis and teletraining.

I.4 multimedia service: Multimedia services are telecommunication services that handle two or more types of media in a synchronized way from the user's point of view. A multimedia service may involve multiple parties, multiple connections, and the addition or deletion of resources and users within a single communication session.

APPENDIX II

Multimedia medical consultation

II.1 Prose Description

Medical consultation involves interactive multimedia communications between medical experts located at two or more separate locations. This communication is generally initiated by a doctor desiring to discuss a particular patient's case with subject matter experts and may occur between the doctor and one consultant only, or may require an interactive conference arrangement between the doctor and several consultants simultaneously.

In the course of the consultation, information may also be required from remote databases containing the patient's medical files; from one or more diagnostic test centres in the form of X-rays, sonograms, electrocardiographs or similar medical images; or from a reference library containing technical information, illustrative medical images, or other supporting material required to facilitate the consultation. This material may be textual, aural, graphical or imagery in nature and may be stored in a multimedia format.

Participants in the consultation may be located in an office or medical facility having access to the full range of broadband multimedia telecommunications capabilities; or located in a moving vehicle, on a golf course, or at some other remote location having limited communications access. In order to accommodate all eventualities, provisions for dynamic resource arbitration and allocation, both during "call" initiation and while the "call" is in progress, are required to ensure that the more important aspects of the interaction are fully satisfied.

II.2 Application Scenario

This scenario is provided in two parts to better represent the wide range of communication environments within which a multimedia medical consultation could take place.

II.2.1 Full multimedia support capability

Dr. "X" is a world recognized authority on bone structure and is widely consulted by other doctors on a frequent basis. Usually, this consultation takes place in Dr. "X"'s office where he has a state-of-the-art multimedia communications terminal with a large high definition video display. A typical consultation might proceed in the following manner:

Stage 1 – Dr. "X" is called by Dr. "Y" via videophone requesting consultation regarding a patient suffering from multiple fractures of the upper foot resulting from an automobile accident. After briefly covering the nature of the injury, Dr. "Y" transmits the patient's examination chart. The full screen video image on Dr. "X"'s screen immediately changes to a two-partition representation depicting the patient's chart in the left half and a reduced video image of Dr. "Y" in the right half.

Stage 2 – Dr. "Y" is on duty in the emergency room of a local hospital and, after discussing the general aspects of the case with Dr. "X" in a face-to-face videophone presentation, switches to his handheld remote videophone camera in order to provide Dr. "X" with a visual survey of the damaged foot.

Stage 3 – With the visual inspection completed, Dr. "X" requests transmission of the X-rays depicting the damaged area taken from different orientations. The two-partition screen presentation is quickly divided into four partitions, one for each of the X-rays to be transmitted.

Stage 4 – After careful scrutiny, Dr. "X" selects the partition which gives the best view of the upper ankle area where most of the serious damage appears to have occurred. The partitioned screen is quickly replaced with a full screen, high resolution depiction of the selected image, enabling Dr. "X" to make a more detailed inspection of the area of interest.

Stage 5 – Careful examination of the tarsal bone structure indicates considerable damage to the tibialis posterior tendon and associated muscle area, a complicating factor which requires the assistance of a third specialist. With the consent of Dr. "Y", Dr. "X" initiates a videoconference call to Dr. "Z", a specialist in tendon reconstruction.

Stage 6 – After advising Dr. "Z" of the nature of the emergency, the three doctors continue discussion of the case. As the videoconference progresses, the patient's examination chart, medical files, X-rays and other reference information are brought into the conference as required, either through the transmission of additional data or recovered from local "memory" if previously transmitted.

Stage 7 – At the end of the conference, Dr. "Y" thanks Drs. "X" and "Z" for their assistance and terminates the consultation.

II.2.2 Restricted multimedia support capability

A week later, another emergency occurs, this time involving a patient whose foot has been crushed in a logging accident. Dr. "Y" again calls Dr. "X" for consultation. While Dr. "X" is available for consultation, it is his day off and all calls are automatically routed either to his home terminal or his portable terminal, depending upon the doctor's location at any particular point in time. In this case, Dr. "X" happens to be on the golf course, accessible from the portable terminal in his golf cart.

In general, the consultation proceeds in a manner similar to that of the previous week. However, due to size limitations placed on the portable terminal and the reduced bandwidth available through the mobile network, service expectations are modified and focused on the more important aspects of the interaction. The less important features are relegated to a nice-to-have but non-essential category. With this in mind, the consultation proceeds in the following manner:

Stage 1 – Dr "Y" initiates a videophone call to Dr "X" to request consultation. Since Dr. "X" is now using his portable terminal, he has elected to receive calls in the "voice only" mode. The network, complying with this service request, establishes the initial connection for voice communication only.

Stage 2 – After advising Dr. "X" of the circumstances surrounding the emergency, Dr. "Y" asks Dr. "X" to switch his terminal to videophone operation in order to visually survey the area of injury. Dr. "Y", recognizing that Dr. "X" is communicating from a portable terminal, bypasses the normal full field view camera on his videophone terminal and activates the handheld remote scanner, holding the camera steady in the vicinity of the injury to compensate for the reduced "motion" response characteristics of Dr. "X"'s portable terminal.

Stage 3 – With visual inspection completed, Dr. "X" requests transmission of an X-ray for the orientation he feels will best portray the extent of damage. To compensate for the size of the portable video display and the reduced transmission rate, Dr. "X" has purchased an enhanced storage feature for his basic portable multimedia terminal in order to capture the considerable amount of data required for high resolution X-rays. In addition, he is willing to accept longer transmission delay in order to obtain the necessary image resolution.

Stage 4 – After careful scrutiny of the damaged area, Dr. "X" requests transmission of an additional X-ray which he hopes will depict the damaged area to better advantage. He elects not to choose a split screen presentation due to the small size of the portable video display, but to take advantage of the local data storage and image manipulation features, which allow him to zoom in on areas of particular interest and to change from one locally stored image to the other at near "office" response times.

Stage 5 – Careful examination of the injury again indicates the need for additional consultation with Dr. "Z" regarding the extensive damage which has occurred to the tendons in the vicinity of the ankle. With the consent of Dr. "Y", Dr. "X" places a voice only conference call to Dr. "Z".

Stage 6 – After advising Dr. "Z" of the nature of the emergency and that he is calling from a mobile terminal, Dr. "X" asks Dr. "Y" to initiate a three-way videoconference to further discuss the case. In order to make maximum use of the bandwidth available for the more important imagery data, Dr. "X" elects to join the videoconference in the AUDIOGRAPHICS-only mode (audio plus still image and graphics). As the videoconference progresses, X-ray and other visual information is brought into the conference as required, either through the transmission of additional data or recovered from local memory if the information had been previously sent.

Stage 7 – At the end of the teleconference, Dr. "Y" again thanks both Drs. "X" and "Z" for their assistance and terminates the consultation.

II.3 Implementation notes

II.3.1 Related applications

This Application is closely related to REMOTE MEDICAL DIAGNOSTICS, but differs with respect to the time urgency of the interaction, the terminal facilities and transmission resources available, and the principal media of information interchange.

II.3.2 Associated applications

AUTOMATED ACCOUNTING AND BILLING for the consultants' time, and a permanent record of the interaction (AUTOMATIC ARCHIVAL) are desirable adjuncts to this application.

II.3.3 Security/privacy

The communications associated with this application are privileged in nature and require access to databases containing confidential information protected by privacy laws in most locations.

II.3.4 Service flexibility

There is a need for automated service mechanisms which will allow for:

- 1) initial "call" establishment at the highest common denominator of service capabilities shared by all participants; and
- 2) the dynamic and selective modification of service parameters during "call" progress.

II.3.5 Performance trade-offs

The primary media components are VOICE and IMAGERY. Resolution requirements for the medical images take precedence over the associated increase in transmission delay. For portable terminal applications, resolution also takes precedence over the area of spatial coverage as long as mechanisms are provided for selecting the boundaries of the area to be viewed.

The consultation may be conducted in either a full-motion video or still-frame audiographic mode of operation, depending upon the terminal and transmission capabilities available to the participants.

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- Series C General telecommunication statistics
- Series D General tariff principles
- Series E Overall network operation, telephone service, service operation and human factors
- Series F Non-telephone telecommunication services**
- Series G Transmission systems and media, digital systems and networks
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