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SERIES J: CABLE NETWORKS AND TRANSMISSION OF TELEVISION, SOUND PROGRAMME AND OTHER MULTIMEDIA SIGNALS

Secondary distribution of IPTV services

Overview of the distribution of target-specific content

Recommendation ITU-T J.706

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Overview of the distribution of target-specific content

Summary

Target-specific content distribution is a mechanism for distributing content addressed to specific target users according to a set of distribution policies and specific interactive feedback from the platform to content providers/Ad providers. This Recommendation defines the overall architecture of the target-specific content distribution system on the platform and seeks to describe the relationship between Recommendation ITU-T J.707 and other relevant Recommendations.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T J.706	2012-01-13	9

FOREWORD

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The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

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NOTE

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Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

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1 Scope

Target-specific content distribution is a mechanism for distributing content addressed to specific target users according to a set of distribution policies and specific interactive feedback from the platform to content providers/Ad providers. This Recommendation defines the overall architecture of the target-specific content distribution system on the platform, including its relationship with [ITU-T J.707], which defines the messages between the platform and content providers/Ad providers, and [ITU-T J.380.x]. Also, this Recommendation seeks to clarify the relationship between the target-specific content distribution system and other relevant Recommendations such as [b-ITU-T H.741.0]. This Recommendation also illustrates each interface.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T J.380.1] Recommendation ITU-T J.380.1 (2011), *Digital program insertion – Advertising systems interfaces – Advertising systems overview*.

[ITU-T J.380.x] Recommendation ITU-T J.380.x-series (2011), *Digital program insertion – Advertising systems interfaces.*

[ITU-T J.704] Recommendation ITU-T J.704 (2009), *Functional requirements of the service provider interface for television primary and secondary distribution and associated interactive services*.

[ITU-T J.707] Recommendation ITU-T J.707 (2012), *Messages and protocols enabling the distribution of target-specific content within integrated broadband cable networks*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 enhanced broadcasting [b-ITU-T J.700]: A system that is capable of delivering broadcast programmes over existing secondary distribution networks composed of HFC or FTTx with enhancements by applications and/or services transferred over IP-enabled networks.

3.1.2 linear TV [b-ITU-T Y.1901]: A television service in which a continuous stream flows in real time from the service provider to the terminal device and where the user cannot control the temporal order in which contents are viewed.

3.1.3 placement opportunity [ITU-T J.380.1]: A potentially constrained location relative to digital content where advertisement insertion or content alterations can occur. The alterations may include insertions, replacements, or deletions of content in whole or in part. These locations which contain the opportunity for content insertion have traditionally been referred to as Avails

[b-SCTE 35] for linear video content; however, placement opportunity refers to address and time locations where content may be placed, regardless of platform (i.e., Video in VOD, Banner images on menus and ITV channels, etc).

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

Ad Advertisement

ADM Ad Management Service

ADS Ad Decision Service

CIS Content Information Service

POIS Placement Opportunity Information Service

SIS Subscriber Information Service

5 Conventions

None.

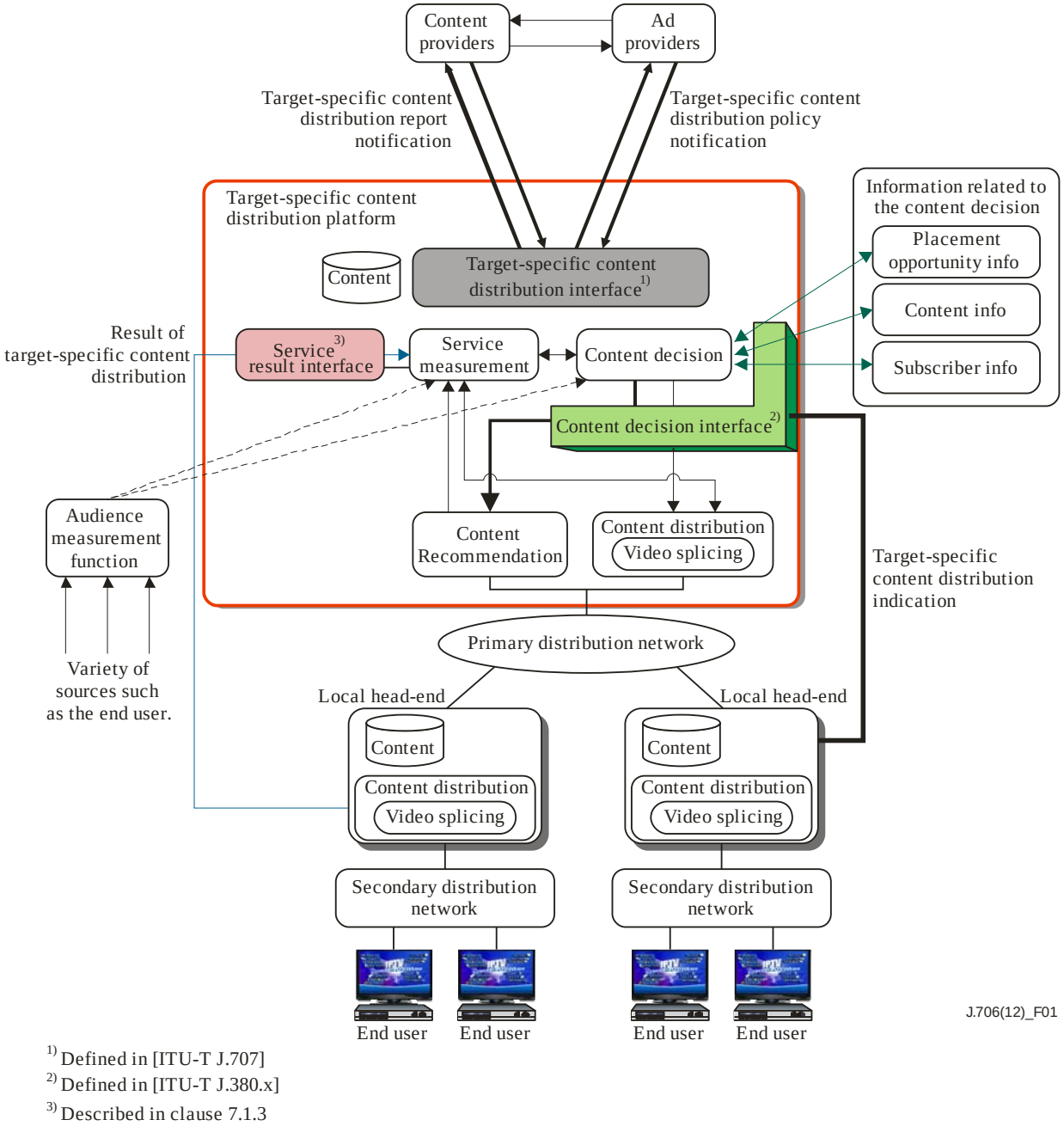
6 Overview of target-specific content distribution

In target-specific content distribution, the platform automatically selects and/or recommends the best content corresponding to the delivery policy, content information, user information, and so on. Appendix I shows examples of target-specific content distribution services.

7 Architecture for target-specific content distribution

Figure 1 shows the architecture for a target-specific content distribution platform. The "target-specific content distribution interface" described in this figure is the interface defined in [ITU-T J.707] which is a component of [ITU-T J.704]. This section defines the overall architecture for target-specific content distribution and clarifies the relationship between each interface and function of the architecture.

Content providers/Ad providers initially send the target-specific content distribution policy to the platform. In content distribution, the content decision function gathers the information necessary for the content decision (e.g., placement opportunity, content info, and subscriber info), and selects or recommends the best content corresponding to the policy. The service measurement function gathers reports from each local content distribution function and sends the integrated report to content providers/Ad providers (target-specific content distribution report).



[1] Defined in [ITU-T J.707]
[2] Defined in [ITU-T J.380.x]
[3] Described in clause 7.1.3

Figure 1 – Target-specific content distribution architecture

7.1 Interfaces of target-specific content distribution platform

Table 1 shows interface requirements for a target-specific content distribution platform.

Table 1 – Interface (I/F) requirements for target-specific content distribution

	Mandatory/optional	Relevant clause
Target-specific content distribution I/F	M	7.1.1
Content decision I/F	M	7.1.2
Service result I/F	O	7.1.3

7.1.1 Target-specific content distribution interface

This is the interface for the content providers/Ad providers, and shall allow the following necessary message exchange between content providers/Ad providers and the distribution platform:

Target-specific content distribution policy notification: This message shall be sent from the content providers/Ad providers to the target-specific content distribution function of the platform. It includes target-specific region/user information, the desired content distribution method (e.g., content will be played at the beginning of the VOD service), a content delivery schedule, and so on.

Target-specific content distribution report notification: This message shall be sent from the distribution platform to the content providers/Ad providers. The purpose is to report the result of target-specific content distribution services.

A target-specific content distribution platform shall support [ITU-T J.707] as the target-specific content distribution interface.

7.1.2 Content decision interface

This interface allows message exchange between each logical entity within (or connected to) the distribution platform. Typically, the content decision function gathers the necessary information through this interface and indicates the content to be distributed or recommended. [ITU-T J.380.1] gives more detail of this interface.

The target-specific content distribution platform shall support [ITU-T J.380.1] as the content decision interface.

7.1.3 Service result interface

This interface allows the gathering of the target-specific content distribution results. It includes the user's response to the target-specific content distribution. The gathering method shall be decided according to the services. Various kinds of gathering methods are applicable. For example, [b-SaFI IAM] provides the user's response to the TV application programmed by EBIF [b-EBIF]. A target-specific content distribution platform should support one or more service result interface.

7.2 Relationship with other functions

7.2.1 Audience measurement function

The target-specific content distribution platform can communicate with one or more audience measurement functions, which are outside of the target-specific content distribution platform. The audience measurement function and its interface are outside the scope of this Recommendation, but various kinds of measurement functions are applicable. For example, [b-ITU-T H.741.0] could provide audience measurement information relevant to IPTV delivery.

7.3 Overview of each function

Table 2 shows functional requirements for target-specific content distribution platforms.

Table 2 – Functional requirement for the target-specific content distribution

	Mandatory/ optional	Number of functions	Note
Content decision	M	One or more	In addition to the internal content decision function, the platform may use functions outside the platform.
Content recommendation	O	One or more	The platform may use this function both internally and externally of the platform.
Content distribution	M	One or more	–
Placement opportunity info	O	Any number	The platform may use this function both internally and externally of the platform.
Content info function	O	Any number	The platform may use this function both internally and externally of the platform.
Subscriber info function	O	Any number	The platform may use this function both internally and externally of the platform.
Service measurement function	M	One or more	–

7.3.1 Content decision function

Content decision is the function to decide the most suitable advertisement content (e.g., spot video commercial, advertising application, etc) for each target user or region. This function is the same as ADS in [ITU-T J.380.1].

7.3.2 Content recommendation function

Content recommendation is the function to select the recommended content (e.g., VOD content, liner TV programme, application, etc.) for each target user or region.

7.3.3 Content distribution function

Content distribution is the function to distribute video (e.g., VOD, Liner TV) and non-video (e.g., TV application, TV widget) assets. To exchange the content decision information, this function equips the ADM interface described in [ITU-T J.380.1].

7.3.4 Placement opportunity info function

Placement opportunity info is the function to hold, maintain, or retain descriptions of placement opportunities. The content decision function acquires the opportunity of advertisement insertion and/or replacement from this function. It is defined in [ITU-T J.380.1].

7.3.5 Content info function

Content info manages metadata describing all the assets (e.g., VOD content, Linear content, advertising video, advertising application, non-advertising application, etc.) and provides the query and notification interfaces to the other functions. It is defined in [ITU-T J.380.1].

7.3.6 Subscriber info function

Subscriber info manages the per-subscriber information. This function provides each subscriber's attribute to the other functions. It is defined in [ITU-T J.380.1].

7.3.7 Service measurement function

This function gathers statistics on the target-specific content distribution and generates the target-specific content distribution report defined in [ITU-T J.707].

Appendix I

Use Cases of target-specific content distribution

(This appendix does not form an integral part of this Recommendation.)

User Case 1: Target-specific advertisement video insertion

Figure I.1 shows an overview of the target-specific advertisement video insertion for VOD. When a user chooses one entertainment video from the VOD top page, the distribution platform chooses the best advertising video corresponding to the user's profile, the content information of the VOD content, and the distribution rule of the advertisement video. Subsequently, the distribution platform inserts the advertisement video at a specific time (e.g., opening of the video) of the VOD content.

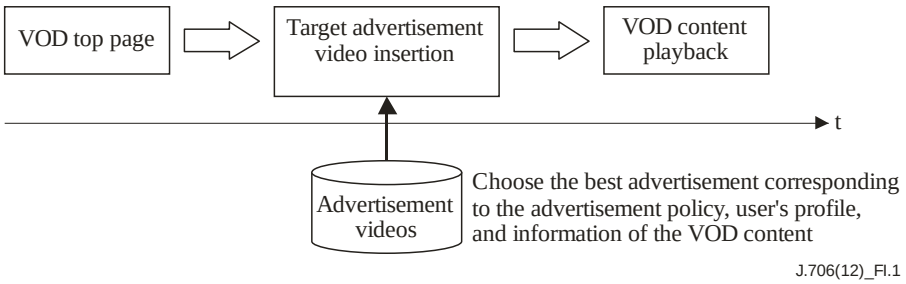


Figure I.1 – Overview of target-specific advertisement video insertion for VOD

Figure I.2 shows an overview of target-specific advertisement video insertion for linear TV. In the linear TV case, an advertising video is also decided as in the VOD case. However, the profile of the video distribution area will be used instead of the individual user's profile. For the advertisement insertion, cueing message technology such as:

[b-ITU-T H.741.0] Recommendation ITU-T H.741.0 (2012), *IPTV application event handling: Overall aspects of audience measurement for IPTV services*.

[b-ITU-T J.181] and video splicing technology such as [b-ITU-T J.189] and [b-ITU-T J.286] are available.

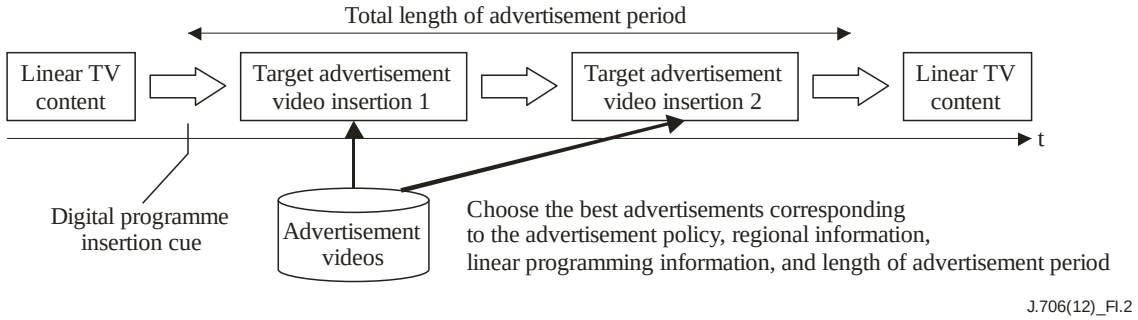


Figure I.2 – Overview of target-specific advertisement video insertion for linear TV

User Case 2.1: Target-specific Ad application insertion for divided TV screens

Figure I.3 is a visual image of the target-specific application insertion for the divided TV screen. In this case, a certain area of the display (the bottom and right areas) is allocated to Ad applications. Ad applications are assumed to be realized by light-weight programming languages such as HTML [b-W3C HTML] + EcmaScript [b-ISO/IEC 16262], procedural content formats [b-ITU-T J.201], or enhanced TV binary interchange format, but it depends on the implementation. The distribution platform chooses the best Ad application from all Ad providers' content and distributes it with the VOD content.

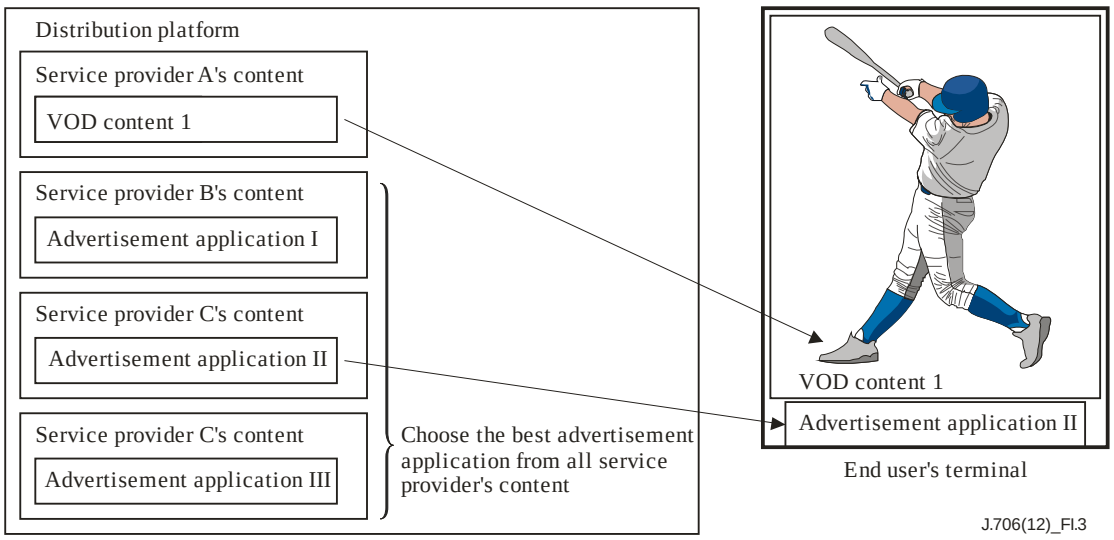


Figure I.3 – Visual image of the target-specific application insertion for a divided TV screen

User Case 2.2: Target-specific Ad application distribution with Ad video content

Figure I.4 is a visual image of the Ad application insertion for the advertisement video content. In this case, Ad provider A prepared Ad applications 1-1 and 1-2 which correspond to the Ad video content 1. When Ad video content 1 is distributed, the distribution platform picks a better Ad application from these applications and distributes it. The assumed service example is the overlay of the local shop information (such as the map, location, special discount offer, etc.) on the global advertisement video of the product. In this service, the spatial position of the Ad application is important for both the user's experience and Ad application integrity. Usually, the advertiser will manually set the spatial location of the Ad application. Also, the advertiser can use an automatic decision mechanism. Appendix II shows an example of an automatic decision mechanism.

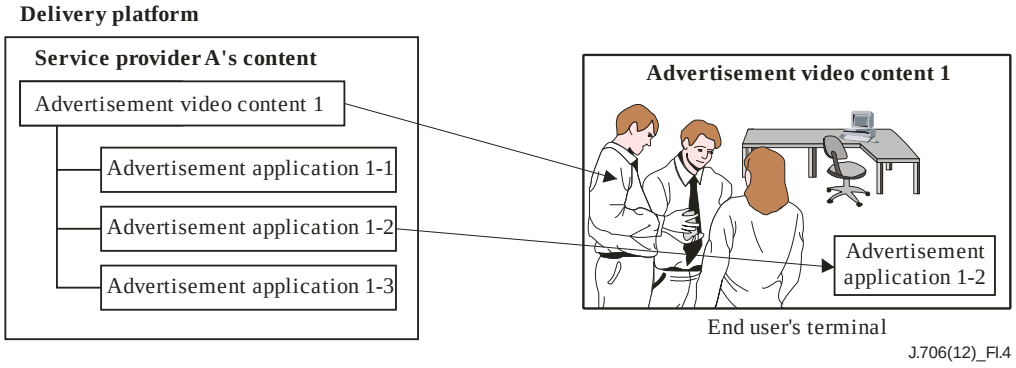


Figure I.4 – Visual image of the target-specific Ad application insertion with Ad video content

User Case 3: Content recommendation

Figure I.5 shows a visual image of the content recommendation service in the service portal page. When the user accesses the portal page, the distribution platform chooses content appropriate for the user and provides thumbnails, preview movies, and/or overview text of the content.

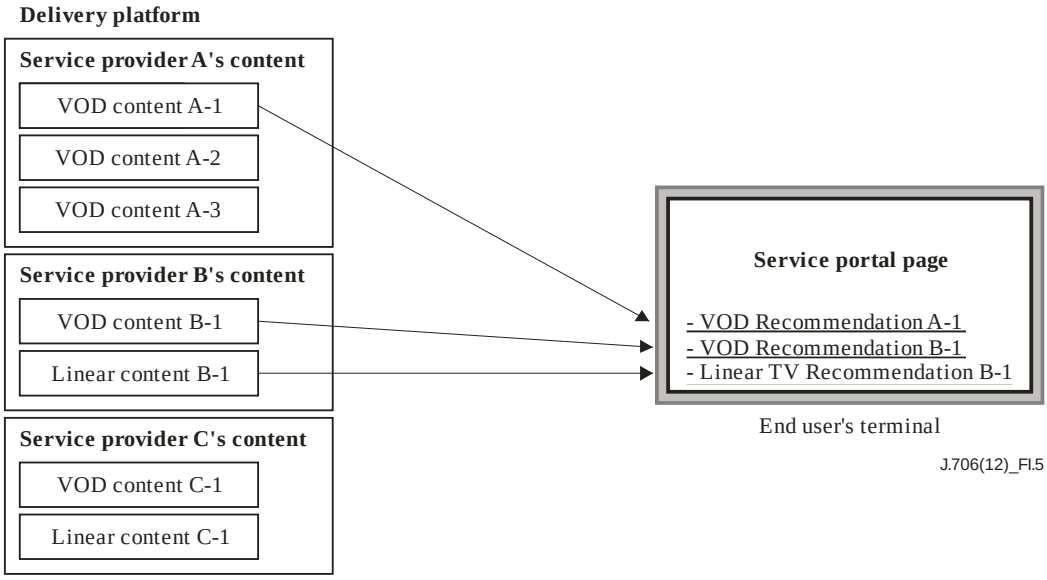


Figure I.5 – Visual image of the content recommendation service

Appendix II

The decision method of spatial location for Ad application overlay

(This appendix does not form an integral part of this Recommendation.)

As described in Figure I.4, when considering the application overlay on the video, the spatial location of the Ad application is important. Figure II.1 shows examples of application overlay for different locations. In the picture on the left, the Ad-application hides the people's bodies and the salient area of the image is far too concentrated to the left. On the other hand, the right image has better balance of the screen. In this appendix, an example of the decision method for the special allocation of the Ad application overlay is described. This function is intended to analyze the stored video signals to determine an appropriate spatial position for Ad application insertion. It is assumed that the function is running on the platform or advertiser's facility. The advertiser can use this function as a tool.

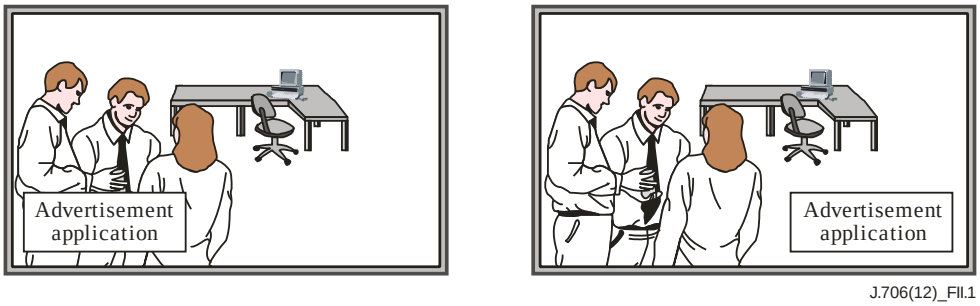


Figure II.1 – Left: bad example of the application overlay
Right: good example of the application overlay

Figure II.2 shows the process flow of the decision method of the Ad application location. First, the number of representative frames is extracted from the video sequence. Then, from each representative frame, the salient area is detected. Many methods are applicable for the salient area detection, for example:

– Face detection
– Motion intensity detection
– Feature point detection
– Telop detection

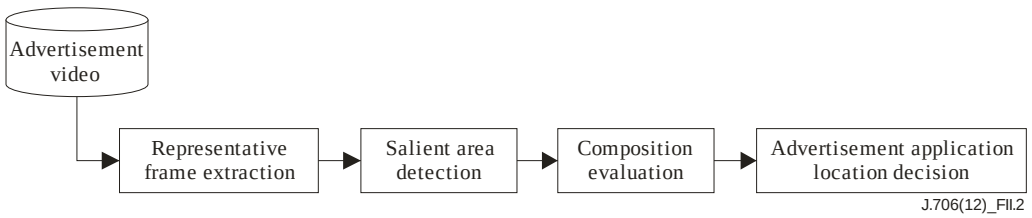


Figure II.2 – Process flow of the Ad application location decision

Figure II.3 shows an example of the result of the salient area detection.

Figure II.3 – Example of saliency area detection

After the salient area detection, each candidate area of the application insertion is evaluated on its distance from the salient area. For example, if the candidate areas are defined as in the left figure of Figure II.4, candidate areas 1 and 2 largely overlap the salient area, thus, they are eliminated. Whereas for candidate areas 3 and 4, the distance from the nearest salient area are compared and d1 is longer than d2. As a result, candidate area 4 is selected as the Ad application area.

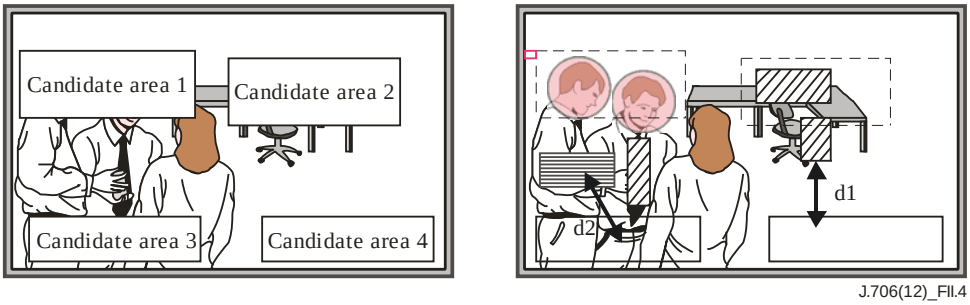


Figure II.4 – Left: Candidate area for Ad application, Right: composition evaluation

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