

Dynamic Advertising Distribution Technology

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Abstract

This article gives an overview of an e-flyer metadata-based advertising distribution system that uses user preference information, device information, and area information. Using e-flyer metadata to represent sales and advertising information related to content enables advertising information to be tailored to users according to their particular circumstances.

1. Current issues with TV advertising

Personal video recorders (PVRs), which are DVD player/recorders incorporating a hard disk drive (HDD), are one of the “must-have” electronic devices of the digital age. PVR sales have increased dramatically in recent years, and PVRs are expected to significantly change the ways in which people interact with and view TV. With the huge popularity of large-capacity PVRs providing over a hundred gigabytes of storage (approximately 42 hours per 100 GB at standard play (SP) picture quality) TV archiving over a week or a month is becoming commonplace. People select what they do not want to watch, rather than what they do want, and they are increasingly fast-forwarding through commercials. Therefore, research and development of new advertising models is essential. Moreover, if new styles of viewing content, such as viewing metadata-based segments provided by cooperative broadcasting and communication systems [1] or viewing TV on mobile devices become common, then this too will necessitate new advertising models. The problems with current TV commercials are well known: unlike programs, advertisements do not provide a way for users to check titles and content and then decide whether or not to watch

them. Moreover, commercials are essentially broadcast to everyone having a receiver with little or no user-specific targeting. That is why people skip commercials and change channels so much. They may also be unhappy when their children see unsuitable commercials.

2. New style of advertising based on metadata

Here we propose a solution that addresses the above issues: metadata-based advertising distribution technology. If metadata that matches programming and/or advertising content is sent over a system supporting two-way communication between broadcast center equipment and the viewer’s terminal, this will allow the targeting and filtering of advertising on an individual basis.

There are various kinds of advertisements on TV: some try to sell the sponsor’s products, others enhance the image of companies, while others publicize upcoming TV programs. The use of metadata will permit users to purchase products being advertised, to reserve or buy programs, or to reserve or buy a whole series of programs while watching an ad on TV.

The concept of an advertising distribution service that can be customized for the user is shown in **Fig. 1**. The service can deliver advertising to users that is tailored to the type of device, area, age, gender, and preferred genres of individual users, so it provides much more effective advertising. Here, we highlight e-flyer metadata that is effective for implementing such a

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metadata-based advanced advertising service and an e-flyer metadata-based dynamic advertising distribution system that provides a user-tailored advertising distribution system.

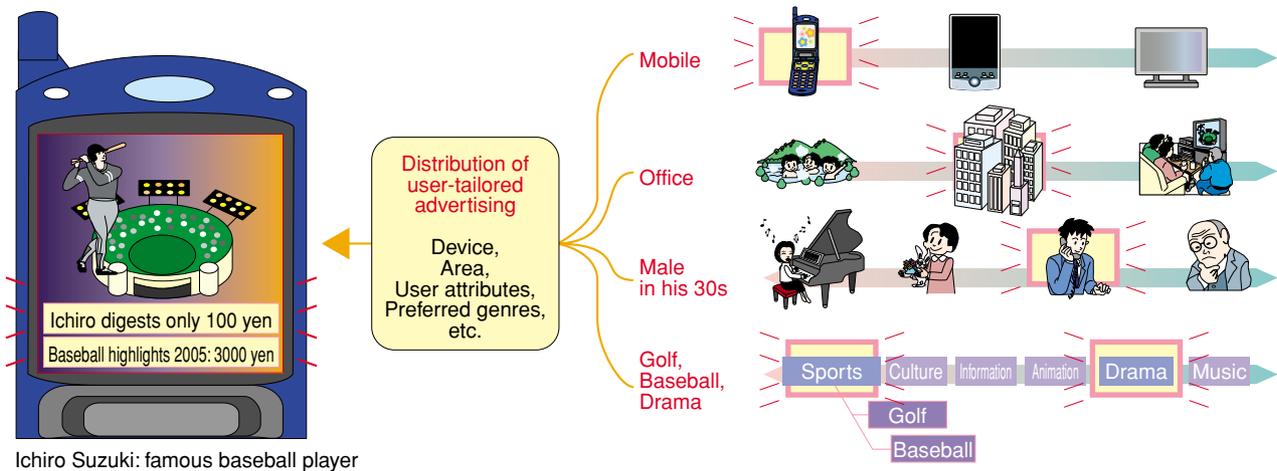
3. E-flyer metadata

A schema defined by the TV-Anytime Forum has been adopted for representing program metadata in cooperative broadcasting/communication systems. The same forum also defined metadata for representing advertising and sales information relating to broadcast program content called e-flyer metadata. E-flyer metadata was first discussed in the Foundation for Multimedia Communications (FMMC) [3], then it was submitted as a proposal to the TV-Anytime Forum, and now it is being considered for imple-

mentation as a standard. It differs from program metadata. The e-flyer metadata should satisfy the following key service requirements. It should:

- 1) Represent content sales information, etc.
- 2) Represent content packages
- 3) Support targeted advertising tailored to individual users.

Some examples of how e-flyer metadata is represented are shown in Fig. 2. E-flyer metadata can be used to represent sales information such as content price, usage conditions, and sales period. It can also represent different content configurations such as series content, related content, related products and goods, and content selection from among several content options. This ability to represent links to related information enables us to envision all sorts of potential applications depending on the service, for exam-



Ichiro Suzuki: famous baseball player

Fig. 1. User-tailored advertising distribution system.

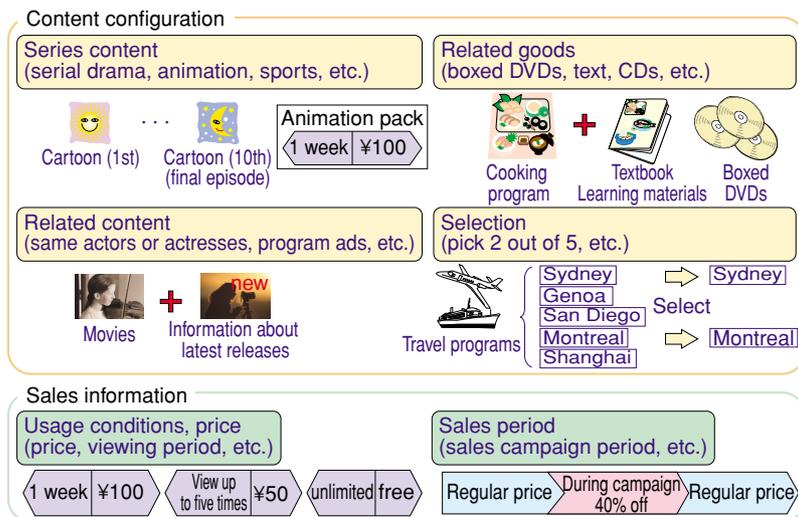


Fig. 2. Examples of representing e-flyer metadata.

ple, a download service of mobile phone ring tunes using melodies of the content's opening theme and an online shopping service for goods related to the content (Fig. 3). What is more, the metadata also supports user targeting, so you can specify the type or class of users that an ad or commercial is targeting.

An e-flyer metadata schema for representing sales and advertising information for the various content configurations mentioned above is shown in Fig. 4. One can see that the e-flyer metadata schema for representing a single content item differs from that for representing the content of a group consisting of mul-

ti-ple content items. Basic information for a single content item is represented as a ProgramLocationTable element, while the basic information for group content item is represented as a GroupInformationTable element. These various InstanceDescription elements and BasicDescription elements represent information about content title and summary (ad copy), genre, what sort of user the content is targeting, and so on. In addition, other content, group content, and goods that are related to the content are represented by Related-Material elements; and content that is included as a member of a group specifies the parent group content

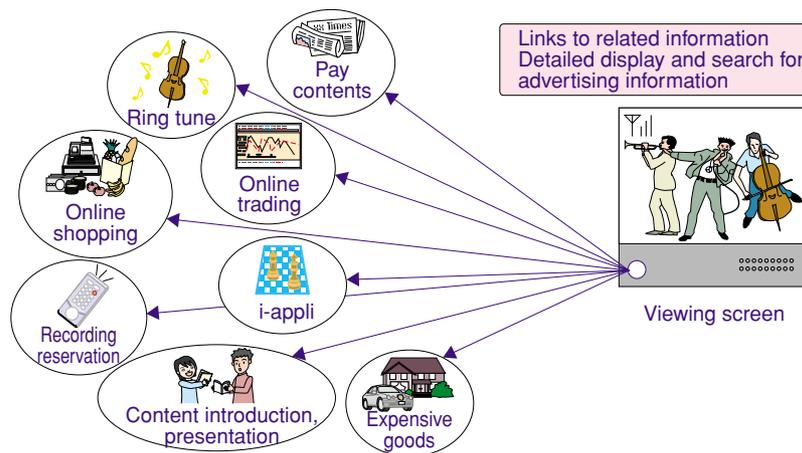


Fig. 3. Examples of links to related information.

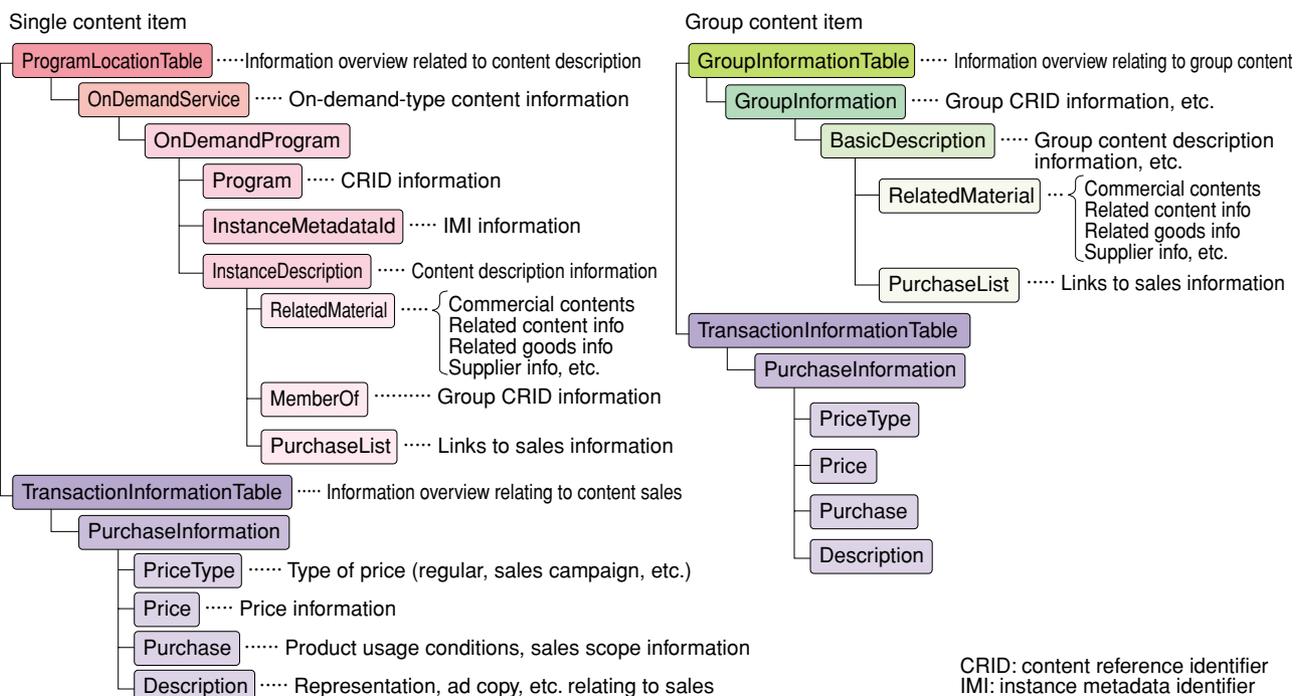


Fig. 4. E-flyer metadata schema.

in a MemberOf element. Furthermore, usage conditions, price, the period during which the price is valid, and so on are represented by TransactionInformationTable elements. Information regarding sales is also represented. Because e-flyer metadata is in XML (extensible markup language) format, it can be distributed and reused over the Internet and over intranets.

4. E-flyer metadata-based dynamic advertising distribution system

A media asset management platform [4], which is a system that performs situation adaptive metadata retrieval, is used to display e-flyer information that meets the needs of users. Situation adaptive metadata retrieval is a technology that enables information to be processed and presented so that it is tailored to the individual. It enables e-flyer information to be selected and presented based on the user's individual attributes (age, gender, location, genre preferences, and the like).

A media asset management platform divides users into groups based on their attributes, stores and counts user usage history data for each group, statistically calculates recommendation values for each type of content or each genre, and then recommends e-flyer information tailored to individual users.

Calculating recommendation values based on usage history is not very effective when the service is first started because there is not much usage history data to utilize. Calculating recommendation values with the method described here tends to be more effective, because it features an automatic group subdivision function that automatically divides users into ever finer groups as more viewing history is accumulated.

In other words, the grouping of users is initially coarse in the absence of usage history (Figs. 5 and 6). Moreover, because the user attribute information and user history information needed to generate recommendation values does not contain individual-specific information, the recommendation values are made while safeguarding the privacy of the individual users.

Note that not only positive recommendations but also negative recommendations are made at the same time, enabling e-flyer information to be filtered based on age limitations, regional restrictions, and other user attributes.

5. Concluding remarks

Three special features of the dynamic advertising distribution system and the advantages they provide are described below.

1. The e-flyer metadata conforms to the TV-Anytime specifications: Even if the user's device is replaced, the same recommendation and filtering services can be received.
2. The user cannot be identified from the user attribute information and user history information: Usage history information can be collected without violating the privacy of individuals.
3. The user history information and advertisement content recommendation values are managed on the broadcasting station side rather than in the user's terminal (e.g., set-top box, mobile computer, or mobile phone): Recommendation services

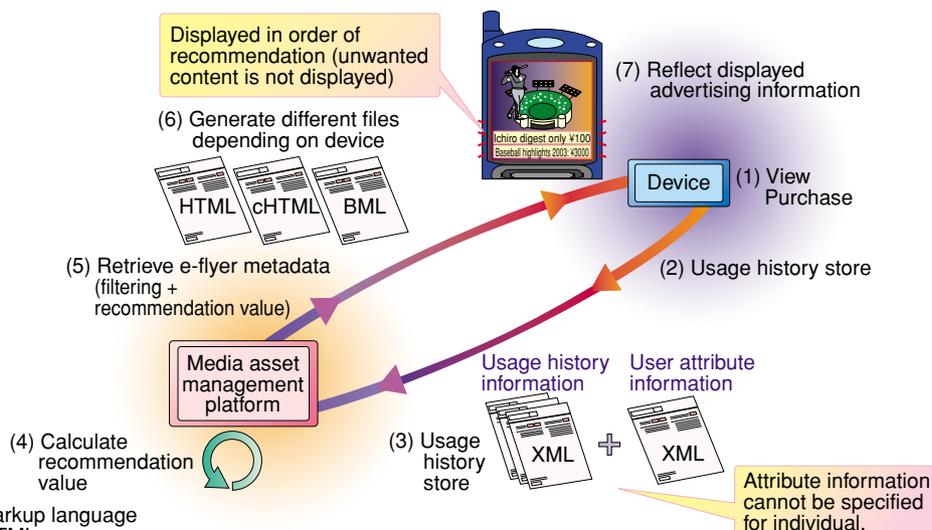


Fig. 5. Recommendation and filtering flow.

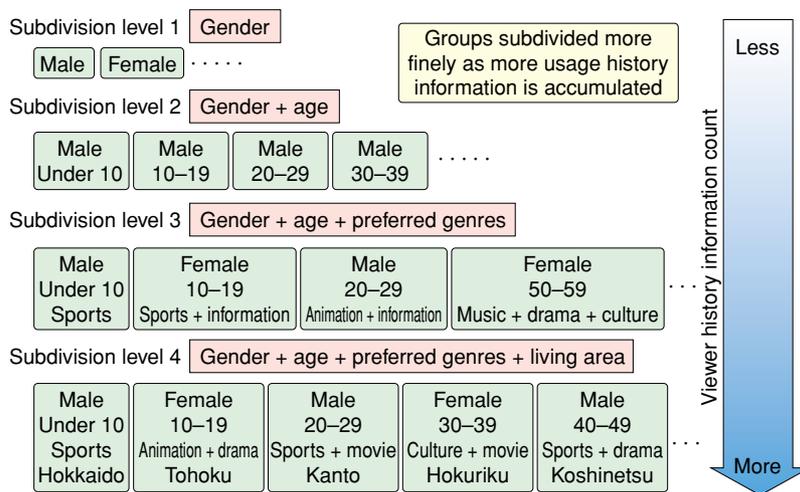


Fig. 6. Example of automatic subdivision.

that reflect trends in content can be received.

At present, TV commercials differ from TV programs in that there is no way for people to decide in advance whether their content is likely to be of interest to them. Many viewers are unhappy with irrelevant or objectionable ads. By using e-flyer metadata, a sponsor can target particular users and present advertisements to them effectively. Users, on the other hand, can get desirable advertising information or discard irrelevant advertising information or ads that are unsuitable for children for example. In other words, this technology can create an advertising service model in which the interests of users, sponsors,

and providers are all satisfied. In future work, we intend to research a new technology and service to expand the coverage of programs and advertising delivery systems that use metadata.

References

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