

Framework for Personalized Broadcast Notice based on Contents Metadata

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1. Introduction

A million and one kinds of multimedia contents, intelligent TV broadcasting systems and various smart TV terminals motivated personalized contents recommendation for more convenient and useful contents consumption. For more sophisticated contents recommendation, many studies focus on how to sort out preferred contents for broadcasting contents consumers based on user profile, contents usage history, social information, device information, and so on. In [1], a CRM (content recommendation methods) is proposed to recommend web content using degree of centrality and term frequency-inverse document frequency (TF-IDF). Another study [2] proposes a personalized recommendation scheme which considers the activities of the user at runtime and the information on the environment around the user. Social recommendation and delivery systems for video and TV content was focused as a special issue in a related journal [3]. An automatic recommendation scheme based on collaborative filtering is presented in [4] for intelligent personalization of (IP)TV services. A web 2.0 TV program recommendation system is introduced in [5] to describe the design, development, and startup of queveo.tv.

Although there are various kinds of studies in contents recommendation, there is little study on contents recommendation based on objects which appears in multimedia contents including person, landmark, and things. For example, consumers may want a notice when his/her favorite actor or a car with a certain model number and color appears in a broadcasting content. We propose a framework for personalized broadcasting contents notice, a kind of contents recommendation, based on contents metadata where the timeline metadata includes information of persons, things, and landmarks which appears in the content. For the personalized content broadcasting notice, we assume that consumers can configure the preferred conditions regarding appearing objects.

2. Proposed framework

The proposed framework is composed of *Object Appearance Conditions*, *Other Conditions*, and *Policy*, where the first and the third functions are mandatory. *Object Appearance Conditions* includes several notice conditions regarding object appearance in broadcasting contents. *Policy* includes several notice policies such as *Scoring*, *Notice Policy*, and so on.

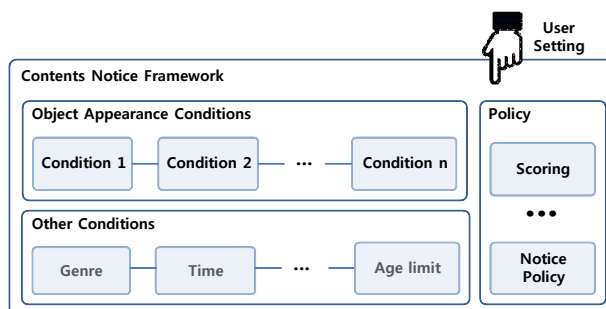


Figure 1. Architecture of contents notice framework

The *Object Appearance Conditions* can have two kinds of conditions on many candidate objects which appears in broadcasting contents. For example, a condition regarding object *A* can be, *A* or *not A*, where *A* or *not A* means that an object *A* is included or not included in the frames of a content.

The working procedure of the contents notice framework is as follows. *Object recognition*: There are huge kinds of objects appearing in multimedia contents including persons, landmarks, and other things. For object based content notice, pre-defined objects need to be recognized before the contents are consumed. This recognition procedure may be real-time or not, according to the recognition system performance and contents type. *Metadata generation*: The result of objects recognition is added to the contents in the form of metadata. Since object appearance information is timeline metadata, it is attached to each corresponding frame. The information basically includes object identification information and can optionally include color, shape, status, and so on. *Mapping of conditions*: While multimedia

contents are provided for consumers, continuous mapping of object appearance conditions of each user with the provided metadata is required. *Notification*: When the object appearance condition settings and the content metadata are identified to be matched, content notice is delivered to the consumer using pre-defined method. When the notice is delivered, the user maybe would consume the content with simple operation.

Figure 2 shows an example of broadcasting content notice service based on the TV metadata. In the example, the object appearance condition is set as *(Person-Alice) And (Person – Bob) And (Place – not School)* which means that persons named Alice and Bob are included in the image and the place where Alice and Bob exist is not a school. Considering object recognition capability of the system, context-aware conditions such as weather, day or night, inside or outside, Alice is in a car or out of a car can be set. TV contents streaming service, in the example, is provided using channel A, B, C, and D. During broadcasting, for pre-defined objects, object recognition is executed and the result is generate as contents metadata and tagged to the corresponding frames. At a certain time, when a user is not watching TV, the system recognizes that object identification metadata of channel D satisfies the object appearance conditions already set by the consumer. The system immediately notify that “*Soap opera ‘you who came from the stars’ is on broadcast on channel D with Alice, Bob and without School*”. The notice is delivered to the pre-defined mobile phone in this example, and can be delivered to the screen when the user is consuming another TV channel.

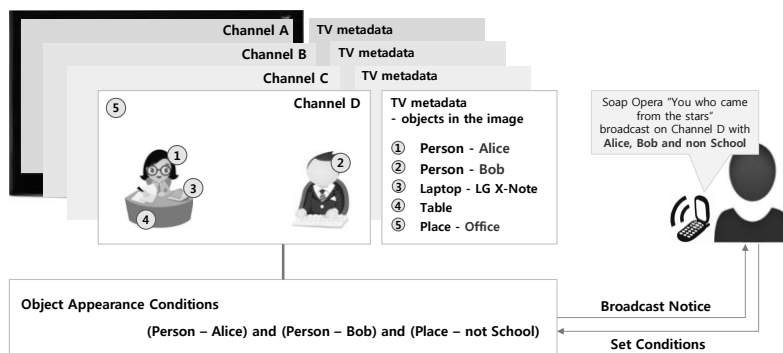


Figure 2. Broadcasting content notice procedure based on TV metadata

3. Conclusion

The proposed framework provides object appearance based content notice. This kind of content recommendation scheme can be adopted with other kind of recommendation functions since the notice conditions do not collide with other traditional ones such as user profile, usage history, social information, and so on. The proposed system is rather distinctive in that it does not consider the mentioned traditional ones at all, and only consider objects and object-oriented conditions of multimedia contents.

4. Acknowledgment

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5. References

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