TITLE: METHOD AND SYSTEM FOR PROVIDING MULTIMEDIA CONTENT AND EVENT NOTIFICATION TO A USER

Abstract: In order to achieve an improvement in terms of a better user experience a method and a system for providing multimedia content to a user, wherein the multimedia content is delivered via a digital data network from a multimedia content source to the user's multimedia receiving terminal, and wherein metadata from at least one metadata source is attached to the multimedia content, the metadata being related to information about the multimedia content, are characterized in the steps of specifying customized preferences on the part of the user regarding content and/or events he is interested in, selecting metadata which correspond to the user's specified preferences, and transmitting the selected metadata to the user's terminal.
METHOD AND SYSTEM FOR PROVIDING MULTIMEDIA CONTENT AND EVENT NOTIFICATION TO A USER

The present invention relates to a method for providing multimedia content to a user, wherein the multimedia content is delivered via a digital data network from a multimedia content source to the user's multimedia receiving terminal, and wherein metadata from at least one metadata source is attached to the multimedia content, the metadata being related to information about the multimedia content.

Furthermore, the present invention relates to a system for providing multimedia content to a user, wherein the multimedia content is delivered via a digital data network from a multimedia content source to the user's multimedia receiving terminal, the system comprising at least one metadata source for providing metadata to be attached to the multimedia content, the metadata being related to information about the multimedia content.

Today's multimedia consumers, in particular TV viewers, are more or less limited to watch a single multimedia or TV channel at the same time. Currently, there are only very limited solutions that allow TV viewers to watch multiple TV channels (or multimedia streams, to put it in a more general form) at the same time. For example, some TV broadcasters offer a so-called conference view where multiple TV streams are shown at same time on a single TV channel. In particular, this technique is applied in the field of sports related TV streams, especially in the case of the transmission of soccer games. The transmission is switched between concurrently played soccer games at different locations. The source changes when something interesting (goal, penalty, etc.) happens at the other place which is currently not shown and run in the background. However, the decision regarding the content switch is made by the TV broadcaster with the TV viewer having no chance to influence this decision.

Another possibility to watch multiple TV channels is provided by special TV sets which are equipped with a so-called picture-in-picture functionality, which allows for
two TV channels being displayed at the same time. However, in general, the technical features of the TV set limit the simultaneous display to two channels.

Nowadays multimedia content and service provider enrich multimedia broadcasts with additional information like, for instance, video text (which is unsynchronized to the stream) or with subtitles (which are synchronized to the stream but limited to text only). Furthermore, the provision of metadata is known. Metadata in general refer to some selected properties of other usually more complex data, that is, metadata form “data about data”. For example, metadata may include information regarding the name, the director, the actors, the lengths, the language, etc. of a movie. However nowadays, metadata is static, i.e. the user has no possibility of influencing the process of metadata provision.

It is therefore an object of the present invention to improve and further develop a method and a system of the initially described type for providing multimedia content to a user in such a way that by employing mechanisms that are readily to implement an improvement in terms of a better user experience is achieved.

In accordance with the invention, the aforementioned object is accomplished by a method comprising the features of claim 1. According to this claim such a method is characterized in the steps of

 specifying customized preferences on the part of the user regarding content and/or events he is interested in,

 selecting metadata which correspond to the user’s specified preferences, and

 transmitting the selected metadata to the user’s terminal.

Furthermore, the aforementioned object is accomplished by a system comprising the features of claim 10. According to this claim a system for providing multimedia content to a user comprises

 a selection means for enabling the user to specify customized preferences regarding content and/or events he is interested in, and

 a metadata control function for selecting metadata which correspond to the user’s specified preferences and for transmitting the selected to the user’s terminal.
According to the invention, it has first been recognized that an improvement in terms of a better user experience can be achieved by facilitating an interaction between server sides (multimedia broadcasters, in particular IPTV content and service providers) and client sides (e.g. TV viewers). Furthermore, it had been recognized that the provision of metadata provides a useful approach for an enhancement of user experience. Thus, according to the invention the user is enabled to specify customized content and/or events related preferences according to his interests. Metadata which correspond to the user's specified preferences are selected by a metadata control function and then transmitted to the user's terminal. The invention allows for real interaction as the user can specify preferences which are taken into account for the metadata provision process.

Advantageously, the delivery of the multimedia content is IP based, i.e. the digital data network which is used for the delivery of the multimedia content may be the Internet. Insofar the invention can be based and built up on existing IPTV technology.

According to a preferred embodiment, the metadata provided by said at least one metadata source is scheduled in advance according to configurable criteria. By this kind of metadata information regarding predictable issues can be provided.

According to an especially preferred embodiment, the metadata provided by said at least one metadata source is related to real time or at least approximately real time events. By this kind of metadata real time interaction between server and client can be established. A high degree of user experience is achieved as the metadata may be related to unpredictable events which happen on a random basis. For example, the user could be updated in real time about important events of a soccer game (goals, faults, penalties, etc.).

Regarding the provision of the metadata to the user in synchronization with the multimedia content it may be provided that the metadata is transmitted together with the multimedia content in the same stream. To this end, the metadata may be encapsulated inside the multimedia stream by means of any of the available protocols, i.e. MPEG or Ogg.
Alternatively, with respect to bandwidth saving the metadata may be transmitted independent of the multimedia content, i.e. metadata and multimedia content are transmitted separately. In such an implementation e.g. SIP messages may be employed for transporting the metadata, as SIP is the signalling protocol which is used for most of the streaming protocols. Alternatively, WebServices may be used, as they are easy to implement and their robustness has been already proved.

As regards a high ease of use it may be provided that the transmission mode of the metadata (i.e. in-stream or out-stream, as described above) is automatically determined according to certain requirements specified by the user. For instance, if the user wishes to follow two different multimedia streams and wants to do fast zapping between them, the metadata may automatically be transmitted in-stream, i.e. together with the multimedia content.

According to a concrete implementation metadata provided by said at least one metadata source is continuously transmitted to the user’s terminal and the metadata selection process according to specified user preferences is performed at the user side. Regarding a load release on the user side, an entity, which in the following is called metadata provider, may be established, which handles the metadata provided by said at least one metadata source. In this configuration, the user may subscribe to the metadata provider and may provide his specified preferences to the metadata provider. The metadata provider will perform a check of the metadata it receives on the basis of the specified preferences. Only metadata for which the check gives a positive result, i.e. the metadata corresponds with the user’s specified preferences, are transmitted to the user.

The user’s terminal may be configured to automatically react to the received metadata according to terminal specifications set by the user. Through this, it is possible that users will be notified, as the case may be, in real-time about contents and/or events in other channels without the need of manual interaction. Instead, the user may be automatically prompted with information pop-ups each time the user receives metadata, i.e. each time there is content and/or an event on one of the background channels which corresponds to his specified preferences. The user’s
terminal may be configured to react in a completely automated way, for instance, but not limited to, switching temporally from one multimedia stream/channel to another, or, e.g. in case of a TV stream, enlarging one TV stream while shrinking the other TV stream or splitting the screen of the user's terminal. Moreover, it is possible to display pop-up messages and/or to scroll some text on the display of the user's terminal. The user may be enabled to create his personal profile to which a policy-based decision engine associated. The behaviour of the user terminal may be set up by using the decision engine which may comprise personalized polices, priorities and/or preferences.

In a preferred embodiment the system comprises a recording means for recording multimedia content. The recording means may be configured to record multimedia content of a primary multimedia stream (i.e. the multimedia stream the user is primarily watching) during the shift to another multimedia stream received metadata is related to. After switching back to the primary multimedia stream, the missing part may be displayed from the recording means with the time shift. The decision, whether the user wishes the missing part to be resumed or not, may be designed as a configurable parameter that may be predefined by the user. The recording means may include, but is not limited to, a pre-cache implemented at the user's terminal or a personal video recorder which may be provided, e.g., in a set up box or in the network.

The metadata control function may comprise an event recognition means for identifying content and/or events that correspond to the preferences specified by the user. Most suitably, the recognition/identifying process is performed on the part of the content provider who, in general, disposes of all necessary information. The content and/or event identification may be performed either manually or, alternatively or additionally, by computer based means, e.g. by employing image recognition software. As the identification of a certain event as corresponding to the preferences specified by the user, in general, will be slightly time-delayed, a recording means is suitably employed to be able to play back the content that has been identified as being relevant.
As regards a versatile usability, the system may comprise a metadata aggregation function for aggregating metadata from several metadata sources. The metadata aggregation function enables a user to arbitrarily combine different metadata.

There are several ways how to design and further develop the teaching of the present invention in an advantageous way. To this end, it is to be referred to the patent claims subordinate to patent claims 1 and 10 on the one hand and to the following explanation of a preferred embodiment of the invention by way of example, illustrated by the figure on the other hand. In connection with the explanation of the preferred embodiment of the invention by the aid of the figure, generally preferred embodiments and further developments of the teaching will be explained.

In the drawings:

Fig. 1 is a functional diagram illustrating three relevant functions by which a provision of metadata enriched multimedia content is feasible, and

Fig. 2 is a schematic view of an embodiment of a system according to the invention.

Fig. 1 is a functional diagram in which the principal functions implemented in a method according to the invention are illustrated. A so-called RTMDCF (Real Time Metadata Control Function) may be interpreted as a metadata source and provides both a real time and scheduled metadata for multimedia content, in particular for IPTV content. In general, the RTMDCF will be implemented at the content provider side who will provide the majority of the real time metadata, as the content providers have typically all necessary knowledge know when important events take place. However, to allow for different ways of binding metadata to multimedia content, in particular to a TV content, the metadata feeding may be employed at several different points. Thus, for example, service providers could be enabled to add personalized metadata depending on user profiles. This metadata could be real time advertisements, special offers, etc. Furthermore, users themselves may be enabled to generate their own metadata, e.g. to inform friends about interesting IPTV content.
and/or events, even though those friends are not subscribed to the respective multimedia channel. In this context, users may be enabled to set up in their preferences the way of how to react in front of a U2U (user to user) metadata depending on the relation level with the other user.

As can be obtained from Fig. 1, the RTMDCF handles over the metadata to a so-called MDACF (Metadata Aggregator Control Function). This function is responsible for aggregating metadata from one or several RTMDCFs. Furthermore, it might add scheduled metadata from third parties. In a general scenario, also the handling of user subscriptions will be performed by the MDACF. The MDACF will be most suitably implemented at a new type of service provider which could be named "metadata provider". The function of the metadata provider will be described in more detail in conjunction with Fig. 2. However, any other provider will be able to send metadata directly to end-users.

A so-called UECF (User Equipment Control Function) is implemented at a user's terminal. The UECF consumes metadata and may control the user's policy decision engine. This engine handles the interpretation of messages contained in the metadata and controls an automatic reaction according to the profile predefined by the user. In this context the user can set up his IPTV equipment to behave in a certain way through several options like configuration files, user policies, or metadata priority. Finally, the UECF is enabled to provide U2U metadata.

It is to be noted that the functions as described above may be freely distributed amongst the various entities. For instance, the UECF can be co-located with the MDACF on the same device, e.g. the user's terminal. This is illustrated in Fig. 1 by means of the arrows which indicate the metadata flow via the MDACF (solid line arrows) or, alternatively, directly to the UECF (dashed line arrow).

Fig. 2 is a schematic illustration of a preferred embodiment of a system according to the invention. Fig. 2 depicts three content providers CP1, CP2 and CP3. Each content provider provides a multimedia channel, which are TV channels in the embodiment shown. In the illustrated situation content providers CP1 and CP2 transmit a soccer game, respectively. The TV content of content provider CP3 is not
further specified. It is to be noted that all of the three TV channels mentioned above could be provided by a single content provider.

A user has subscribed to channel 1 of content provider CP1 and to channel 2 of content provider CP2. Upon subscription to one or more TV channels, the user receives preconfigured or customized metadata. The metadata which are provided by the content providers CP1, CP2 and CP3 are transmitted to a metadata provider MP (see the dashed line arrows). The user specifies his preferences regarding content and/or events he is interested in and transmits this information to the metadata provider MP. The metadata provider MP continuously receives metadata from the content providers CP1, CP2 and CP3 and checks them by performing a comparison with the currently deposited user preferences. If a matching is detected, i.e. if metadata correspond to the user’s specified preferences, the metadata is selected and transmitted to the user’s terminal.

The metadata transmitted to the user’s terminal (which might be a computer based, enhanced Set Top Box (STB), a PDA, a mobile device, etc.) will allow the user to be updated in real-time about content events in other channels without the need of manual interaction. In the concrete embodiment shown, he will automatically be prompted with information pop-ups each time there is an important event of his interest on one of the subscribed background channels. Furthermore, policy decision engines can even automatically decide when to switch to which TV channel. The behavior of the client’s software may be set up by using personal policies that the user will have associated to his profile, wherein the policies can be related to channel selection and IPTV client behavior. Every user profile will be also associated to a device. In that way, users will be able to specify some specific options when playing the content with a STB and some others while watching it with a small PDA.

The metadata is typically related to not-foreseeable/unpredictable events which randomly happen. In the embodiment shown in Fig. 2, for instance, the user has chosen the soccer game transmitted via channel 1 as primary TV stream he wants to watch. Furthermore, he has specified his preferences in that he is interested in important events (goal, faults, penalties, etc.) which happen in the other soccer game transmitted via channel 2. The metadata provider MP is continuously fed with
metadata from the content providers CP1, CP2 and CP3. If the metadata provider MP receives metadata related to e.g. a goal in soccer game 2, the metadata provider MP transmits a respective metadata to the user's terminal. At the user's terminal a main event alert appears, and the notification is pop-upped on the user's terminal. The user's terminal reacts automatically depending on his set specifications. This is, an automatic channel switch is performed, or both TV streams (channel 1 and channel 2) are displayed simultaneously at the user's terminal. After the important event has been displayed, the user comes back to the primary match in live. However, he can be given the option to resume the missing part or not. Alternatively, the user is enabled to reject the important event in the soccer game transmitted via channel 2 by simply closing the pop-up window.

Many modifications and other embodiments of the invention set forth herein will come to mind the one skilled in the art to which the invention pertains having the benefit of the teachings presented in the foregoing description and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.
Claims

1. A method for providing multimedia content to a user, wherein the multimedia content is delivered via a digital data network from a multimedia content source to the user’s multimedia receiving terminal, and wherein metadata from at least one metadata source is attached to the multimedia content, the metadata being related to information about the multimedia content, characterized in the steps of specifying customized preferences on the part of the user regarding content and/or events he is interested in, selecting metadata which correspond to the user’s specified preferences, and transmitting the selected metadata to the user’s terminal.

2. The method according to claim 1, wherein the delivery of the multimedia content is IP based.

3. The method according to claim 1 or 2, wherein the metadata provided by said at least one metadata source is scheduled in advance according to configurable criteria.

4. The method according to any of claims 1 to 3, wherein the metadata provided by said at least one metadata source is related to real time or at least approximately real time events.

5. The method according to any of claims 1 to 4, wherein the metadata is transmitted together with the multimedia content.

6. The method according to claim 5, wherein the metadata is encapsulated inside the multimedia stream.

7. The method according to any of claims 1 to 4, wherein the metadata is transmitted independent of the multimedia content.
8. The method according to any of claims 1 to 7, wherein the transmission mode of the metadata is automatically determined according to requirements specified by the user.

9. The method according to any of claims 1 to 8, wherein metadata provided by said at least one metadata source is continuously transmitted to the user's terminal and wherein the selection of metadata which correspond to the user's specified preferences is performed on the user side.

10. A system for providing multimedia content to a user, in particular for carrying out a method according to any of claim 1 to 9, wherein the multimedia content is delivered via a digital data network from a multimedia content source to the user's multimedia receiving terminal, the system comprising at least one metadata source for providing metadata to be attached to the multimedia content, the metadata being related to information about the multimedia content, characterized in that the system further comprises
   a selection means for enabling the user to specify customized preferences regarding content and/or events he is interested in, and
   a metadata control function for selecting metadata which correspond to the user's specified preferences and for transmitting the selected to the user's terminal.

11. The system according to claim 10, wherein the user's terminal is configured to automatically react in a preconfigurable manner upon receipt of metadata.

12. The system according to claim 10 or 11, wherein the user's terminal is configured to automatically display an appropriate pop-up window upon receipt of metadata.

13. The system according to any of claims 10 to 12, wherein the user's terminal is configured to automatically switch from the primary multimedia stream being displayed on the user's terminal to the multimedia stream the received metadata is related to.
14. The system according to claim 13, comprising a recording means for recording multimedia content during the length of the switch and for displaying the recorded multimedia content with a time shift after switching back to the primary multimedia stream.

15. The system according to any of claims 10 to 12, wherein the user's terminal is configured to automatically split the screen of the user's terminal for displaying two or more multimedia streams simultaneously.

16. The system according to any of claims 10 to 15, wherein the metadata control function comprises an event recognition means for identifying content and/or events that correspond to the preferences specified by the user.

17. The system according to claim 16, wherein the event recognition means includes image recognition software.

18. The system according to any of claims 10 to 17, further comprising a metadata aggregation function for aggregating metadata from several metadata sources.
Fig. 2
A. CLASSIFICATION OF SUBJECT MATTER

INV. H04N7/24  H04N7/173  H04N5/445

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C.

See patent family annex

* Special categories of cited documents:

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Date of the actual completion of the international search

27 May 2008

Date of mailing of the international search report

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Name and mailing address of the ISA

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