

[0027] FIGS. 13a and 13b show features of an interactive program banner in accordance with a fifth embodiment of the invention;

[0028] FIGS. 14a and 14b show features of an interactive program banner in accordance with a sixth embodiment of the invention;

[0029] FIGS. 15a and 15b show features of an interactive progress bar in accordance with a seventh embodiment of the invention;

[0030] FIGS. 16a and 16b show features of an interactive program banner in accordance with an eighth embodiment of the invention;

[0031] FIGS. 17a and 17b show features of an interactive program guide in accordance with a ninth embodiment of the invention;

[0032] FIG. 18 shows features of an interactive program banner in accordance with a tenth embodiment of the invention;

[0033] FIG. 19 shows features of a user interface for providing an advanced find feature; and

[0034] FIGS. 20a and 20b show features of user interfaces for providing an advanced viewer preference update feature.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0035] For purposes of this disclosure, the terms “segment metadata” and “program segment metadata” refer to data that includes description of the content of an individual segment of a television program, such as a segment identifier, title, content summary, categories, keywords, and that further includes timing information for the segment such as a start time, end time, start time and duration, reference to video frames. FIG. 4 shows examples of program metadata and segment metadata in accordance with an embodiment of the invention. The program metadata includes a variety of descriptive information concerning a television program, including the program title, a program description, and categories and keywords that are descriptive of the subject matter of the program, and actors and directors associated with the program. It is preferred that each category is provided with a corresponding score indicating the goodness of fit of the category to the subject matter of the program. The illustrated program metadata further includes timing information such as the start time and duration of the program. Other program information typically included in the program metadata such as a unique program identifier is also illustrated.

[0036] The segment metadata of FIG. 4 is similar to the program metadata, but is distinguished from the program metadata in that it provides content and timing information that is specific to an individual segment of a program rather than to the program as a whole. The illustrated segment metadata includes descriptive information including a segment title, a segment description, categories and keywords that are descriptive of the subject matter of the segment, and actors and directors associated with the segment. The illustrated segment metadata further includes timing information such as the start time and duration of the segment. Other segment information typically included in the segment metadata such as a unique segment identifier is also illustrated.

[0037] In the preferred embodiment, program metadata and segment metadata are distinct data objects that have logical relationships through the particular data that they contain. For example, the segment metadata of FIG. 4 is related to the program data of FIG. 4 in that they both reference the same program identifier, program title, channel, and date, and the time of the segment is within the time of the program. Thus it is known that the segment metadata of FIG. 4 describes a segment of the program described by the program metadata of FIG. 4. However in alternative implementations other methods may be used to specify relationships between program metadata and segment metadata objects, or metadata objects may be allowed to contain both program metadata and segment metadata.

[0038] Further details regarding the generation and use of program and segment metadata as described above are provided in patent applications owned by the assignee of the present application, including published application US 2002/0092002, published 11 Jun. 2002, which is incorporated herein by reference for its teachings regarding the generation and use of program and segment metadata and for its other teachings referenced herein.

[0039] FIG. 5 shows an exemplary system for supplying program and segment metadata to a viewer's video receiver device. Program and segment metadata are preferably supplied by a metadata provider 40 to a system operator 42 such as a cable system operator or satellite television provider. The system operator 42 in turn supplies the metadata to individual video receiver devices 44 such as set top boxes and personal video recorders. In the case of cable and satellite systems, the metadata is typically supplied through the video data transmission medium as out-of-band data, that is, through a channel designated for transmission of non-video data. In other embodiments the video receiver device may obtain metadata in other manners such as through a dial-up or network connection to the metadata supplier.

[0040] The segment metadata supplied by the metadata supplier is preferably produced through the use of production agents 46 that interface directly with the production systems of television program producers 48 to extract production data that is processed to generate program metadata for the programs and to identify individual program segments and generate segment metadata for those segments. A preferred system for producing segment metadata in this manner is MyDTV Inc.'s ContentIQ metadata production system, aspects of which are described in the patent application incorporated above. This type of deployment enables production of detailed program and segment metadata in a highly automated fashion, and enables the production and distribution of detailed program metadata and segment metadata even for programs whose contents are typically not known until shortly before or at the time of broadcast, such as news programs and sporting events. However, alternative methods of metadata production and distribution may also be employed. For example, metadata may be distributed from the metadata provider to user devices through a system other than the video distribution system.

[0041] FIG. 6 shows a high level view of the architecture of a video receiver device in accordance with an embodiment of the invention. The illustrated components are typically implemented through a combination of software pro-