and an account balance management module that manages advertisement account points for the users based on the received playback reports.

[0008a] In another aspect, there is disclosed a content streaming server apparatus, comprising: a bitstream receiver that receives, from a content provider, a bitstream comprising audiovisual content; a content store that stores the received bitstream; a content segmenter that segments the received content into static segments that are not time-shifted and time-shiftable segments; an index generator that generates an index table comprising indices for independently accessing the time-shiftable segments; a credit determiner that determines an amount of credit points available to the user to control playback of the shiftable content; and a streamer that streams the content by controlling playback of the shiftable content based on a user input and the amount of credit points available to the user.

[0009] These, and other, aspects are described below in the drawings, the description and the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 depicts high level architecture of a digital program delivery system.

[0011] FIG. 2 depicts an example of time-shifting advertisements using an index table.

[0012] FIG. 3 is a flowchart representation of a method of generating and playing back program content having time-shifted advertisements.

[0013] FIG. 4 depicts an example of a digital program delivery system including an ad exchange server.

[0014] FIG. 5 depicts an example process of assigning values to program segments.

[0015] FIG. 6 depicts an example process of accumulating credit during playback.

[0016] FIG. 7 depicts an example process of accumulating debt during playback.

[0017] FIG. 8 depicts an example process of conditionally skipping advertisements during playback.

[0018] FIG. 9 is a flowchart representation of a method of allowing a user to time-shift advertisement when watching content.

[0019] FIG. 10 is a block diagram representation of an apparatus for time-shifting advertisements.

[0020] FIG. 11 is a flowchart representation of a method of operating an ad exchange.

[0021] FIG. 12 is a block diagram representation of an ad exchange apparatus.

[0022] Like reference symbols in the various drawings indicate like elements.

a playback report reception module that receives playback reports from a plurality of user devices, wherein a playback report includes information indicative of a digital program viewing or an advertisement viewing by a user; and

an account balance management module that manages advertisement account points for the users based on the received playback reports.

19. The apparatus of claim 18, wherein the account balance management module credits points to a user's advertisement account for every digital program or advertisement watched and debits points from the user's advertisement account for every advertisement skipped or fast forwarded by the user.

20. The apparatus of claim 18, wherein an advertisement's playback value is a function of a business agreement between an operator of the content network and an advertiser.

21. A content streaming server apparatus, comprising:

a bitstream receiver that receives, from a content provider, a bitstream comprising audiovisual content;

a content store that stores the received bitstream;

a content segmenter that segments the received content into static segments that are not time-shifted and time-shiftable segments;

an index generator that generates an index table comprising indices for independently accessing the time-shiftable segments;

a credit determiner that determines an amount of credit points available to the user to control playback of the shiftable content; and

a streamer that streams the content by controlling playback of the shiftable content based on a user input and the amount of credit points available to the user.

22. The apparatus of claim 21, wherein the credit determiner increases the credit points available to the user for watching a portion of the shiftable content and reduces the credit points for every skipped portion of the shiftable content.

23. The apparatus of claim 21, wherein the static content includes a digital video program for a linear playback and the shiftable content includes an advertisement.