

[0005] According to a first aspect, there is provided a method of allowing a user to control a time for playback of an advertisement in a shiftable content segment of a bitstream, including: receiving, from a content provider or a content delivery network, a bitstream comprising program content segments and shiftable content segments, wherein the shiftable content segments include content whose relative temporal position within a program is changeable, the bitstream including playback time information for the shiftable content; generating an index table comprising indices for independently accessing the shiftable content segments and program content segments, wherein each index provides data facilitating access and then shifting/arrangement of the playback of the shiftable content segments on any segmentation of the program; receiving a user input to time-shift a shiftable content segment from a first playback time at which the shiftable content segment is to be played during playback of the bitstream to a second playback time that is which may be at any time during playback of the bitstream, including prior to playback of all program content segments; and selectively playing back, based on the user input and an advertisement credit policy, the shiftable content segments and the program content segments to the user.

[0006] According to a second aspect, there is provided a content playback apparatus, comprising: a content receiver module configured to receive, from a content provider or a content delivery network, a bitstream comprising program content segments and shiftable content segments, wherein the content segments are content whose relative temporal position within a program is changeable, the bitstream including playback time information for the shiftable content; a storage module configured to store the program content segments and the shiftable content segments; a bitstream analysis module configured to generate an index table comprising indices for independently accessing the shiftable content segments and the program content segments, wherein each index provides the apparatus with the ability to access and then shift/arrange the playback of the shiftable content segments on any segmentation of the program; a credit determination module that configured to determine an amount of credit points available to the user to control playback of the shiftable content; and a playback control module configured to control playback of the shiftable content segments at any time during playback of the bitstream, including prior to playback of all program content segments, based on a user selection of the shiftable content and the amount of credit points available to the user, the playback control module being configured to remove a user control for providing the user selection of the shiftable content segments when a debt ceiling for the user is reached.

[0007] In an embodiment, at least a portion of the shiftable content in the above method comprises advertisements, the method further including assigning values to programming segments, assigning values to advertisements, maintaining a user's advertisement account, wherein the advertisement account comprises advertisement points for the user, and adjusting, in response to the user playing back a programming segment or an advertisement, the advertisement points for the user.

[0008] Disclosed herein is a server apparatus operable in a content network includes a playback value storage module that stores a list of digital programs and advertisements available for viewing in the content network and corresponding playback values, an account storage module that stores information about advertisement accounts for a plurality of users of the content network, 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.

[0008a] Disclosed herein is a content streaming server apparatus, including 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.

CLAIMS

1. A method of allowing a user to control a time for playback of an advertisement in a shiftable content segment of a bitstream, comprising:

receiving, from a content provider or a content delivery network, a bitstream comprising program content segments and shiftable content segments, wherein the shiftable content segments include content whose relative temporal position within a program is changeable, the bitstream including playback time information for the shiftable content;

generating an index table comprising indices for independently accessing the shiftable content segments and program content segments, wherein each index provides data facilitating access and then shifting/arrangement of the playback of the shiftable content segments on any segmentation of the program;

receiving a user input to time-shift a shiftable content segment from a first playback time at which the shiftable content segment is to be played during playback of the bitstream to a second playback time that is which may be at any time during playback of the bitstream, including prior to playback of all program content segments; and

selectively playing back, based on the user input and an advertisement credit policy, the shiftable content segments and the program content segments to the user.

2. The method of claim 1, further comprising:

generating, upon playing back the bitstream, an advertisement playback report.

3. The method of claim 1, further including:

displaying, to the user, visual controls for time shifting the shiftable content segments, wherein the displaying is responsive to the advertisement credit policy.

4. The method of claim 1, further comprising:

allowing the user to skip playing the shiftable content segment during playback of the bitstream when the advertisement credit policy indicates that the user has sufficient credit for skipping the shiftable content; and

reducing an amount of the credit for the user caused by skipping the shiftable content.

5. A content playback apparatus, comprising:

a content receiver module configured to receive, from a content provider or a content delivery network, a bitstream comprising program content segments and shiftable content segments, wherein the content segments are content whose relative temporal position within a program is changeable, the bitstream including playback time information for the shiftable content;

a storage module configured to store the program content segments and the shiftable content segments;

a bitstream analysis module configured to generate an index table comprising indices for independently accessing the shiftable content segments and the program content segments, wherein each index provides the apparatus with the ability to access and then shift/arrange the playback of the shiftable content segments on any segmentation of the program;

a credit determination module that configured to determine an amount of credit points available to the user to control playback of the shiftable content; and

a playback control module configured to control playback of the shiftable content segments at any time during playback of the bitstream, including prior to playback of all program content segments, based on a user selection of the shiftable content and the amount of credit points available to the user, the playback control module being configured to remove a user control for providing the user selection of the shiftable content segments when a debt ceiling for the user is reached.

6. The apparatus of claim 5, wherein the credit determination module is configured to increase the credit points available to the user for playing back a portion of the shiftable content segments and reduces the credit points for skipping a portion of the shiftable content segments.

7. The apparatus of claim 5, wherein the content segments include a digital video program for a linear playback and the shiftable content segments include one or more advertisements.

8. The apparatus of claim 5, further comprising:

a credit exchange module configured to allow the user to perform accounting operations with the amount of credit points available to the user.

9. The apparatus of claim 8, wherein the accounting operations include checking, buying and selling the amount of credit points available to the user.

10. The method of claim 1, wherein at least a portion of the shiftable content segments comprises advertisements, the method further comprising:
assigning values to program content segments;
assigning values to advertisements;
maintaining a user's advertisement account, wherein the advertisement account comprises advertisement points for the user; and
adjusting, in response to the user's playing back of a program content segment or an advertisement, the advertisement points for the user.

11. The method of claim 10, wherein the adjusting operation includes, crediting advertisement points corresponding to a value assigned to a program content segment, when the user plays back the program content segment.

12. The method of claim 10, wherein the adjusting operation includes crediting advertisement points corresponding to a value assigned to an advertisement when the user watches the advertisement.

13. The method of claim 10, wherein the adjusting operation includes debiting points corresponding to a value assigned to an advertisement when the user skips playback of the advertisement or when the user fast forwards the advertisement.

14. The method of claim 10, further comprising:
allowing the user to perform transactions with the user's advertisement account including a status check transaction by which the user can check a balance of the advertisement account.

15. The method of claim 10, wherein the transactions further comprise a purchase transaction by which the user can increase advertisement points in the user's advertisement account by making a payment.

16. The method of claim 14, wherein the transactions further comprise a trading transaction by which the user can trade a portion of advertisement points in the user's advertisement account with another user's advertisement points in the another user's advertisement account.

17. The method of claim 1, further comprising removing from a user interface displayed to a user a control usable by the user to provide the user input to time-shift the program content segments when a debt ceiling is reached.

18. The content playback apparatus of claim 5, wherein the playback apparatus is configured to receive an updated version of a shiftable content segment and switch out the shiftable content segment to the updated version of the shiftable content segment.