INFORMATION STORAGE MEDIUM HAVING DATA STRUCTURE FOR BEING REPRODUCED ADAPTIVELY ACCORDING TO PLAYER STARTUP INFORMATION, METHOD AND APPARATUS THEREOF

Technical Field

The present invention relates to an apparatus and method of reproducing Audio-Visual (AV) data in an interactive mode, and an information storage medium therefor.

Background Art

PC-based DVDs (hereinafter, referred to as "interactive DVD") capable of reproducing Audio-Visual (AV) data in an interactive mode have been on the market. The interactive DVD stores interactive data supporting an interactive function as well as AV data according to a conventional DVD-Video standard. The AV data recorded on the interactive DVD can be displayed in two modes: one is a video mode in which AV data is displayed in the same form as in a general DVD-Video and the other is an interactive mode in which an AV picture that is reproduced from AV data is embedded and displayed in an interactive picture that is reproduced from interactive data. For example, in a case where the AV data is a movie title, a corresponding movie is shown on the AV picture and various additional information including the scenario of the movie, the story of the movie, the pictures of casts, etc., is displayed on the interactive picture. The additional information can be displayed in synchronization with the movie title (AV data). For example, when a specific actor appears, interactive data containing his/her personal history information can be reproduced and displayed.

The interactive data includes a markup document written in a markup language; a script code as an internal file of a markup document or as a separate file to be linked with the markup document; and an audio file, an animation file, an image file, etc., to be linked with the markup document and be reproduced along with the markup document.

Considering that the interactive mode is aimed to provide a user with various additional contents using markup documents, the effect is very low if a markup document containing additional contents made with a language that a user is unable to read is displayed in an interactive mode.

Disclosure of the Invention

The present invention provides an information storage medium, having a data structure capable of selecting additional contents made with a language selected by a user or with a predetermined language and reproducing AV data in an interactive mode when an information storage medium storing the AV data is reproduced, and a reproducing apparatus and reproducing method thereof.

According to an aspect of the present invention, there is provided an information storage medium including AV data, interactive data, which is displayed along with an AV picture obtained from the AV data, and provides contents related to the AV picture, when the AV data is reproduced in an interactive mode, and language information, which indicates a language of contents contained in the interactive data.

Additional aspects and/or advantages of the invention will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned by practice of the invention.

According to another aspect of the present invention, there is provided an information storage medium including AV data, a plurality of enhanced AV (ENAV) applications, each of which includes substantially the same contents and is made with a plurality of different languages in order to reproduce the AV data in an interactive mode, and language information, which is used to select one among the plurality of ENAV applications.

According to still another aspect of the present invention, there is provided a reproducing apparatus including an AV reproducing engine which decodes AV data, and an ENAV engine, which includes player language information selecting one among a plurality of ENAV applications, each of which includes substantially the same contents and is made with a plurality of different languages, and interprets and executes a selected ENAV application with reference to the player language information in order to reproduce the AV data in an interactive mode.

According to still yet another aspect of the present invention, there is provided a reproducing method of reproducing AV data in an interactive mode, the method including reading language information indicating a language used with contents contained in interactive

data; selecting and reading interactive data made with the same language as player language information set in a reproducing apparatus with reference to the read language information; and interpreting and executing the read interactive data.

Brief Description of the Drawings

These and/or other aspects and advantages of the invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:

FIG. 1 shows a reproduction system according to an embodiment of the present invention;

FIG. 2 is a view explaining operations of an ENAV disk according to the present invention;

FIG. 3 shows a volume space of the ENAV disk shown in FIG. 2 according to an embodiment of the present invention;

FIG. 4 is a diagram illustrating a directory structure of the ENAV disk shown in FIG. 2 according to an embodiment of the present invention;

FIG. 5 shows a relationship between AV data and ENAV files recorded on the ENAV disk shown in FIG. 2 according to an embodiment of the present invention;

FIG. 6 is a block diagram of a reproduction apparatus according to an embodiment of the present invention;

FIG. 7 shows a startup file STARTUP.MLS according to an embodiment of the present invention;

FIG. 8 shows a startup file STARTUP.MLS according to another embodiment of the present invention;

FIG. 9 shows a system parameter table in which profile information is listed, according to an embodiment of the present invention;

FIG. 10 is a view explaining a data structure of profile information recorded as a system parameter of FIG. 9; and

FIG. 11 is a flowchart explaining a reproduction method according to an embodiment of the present invention.

Best mode for carrying out the Invention

Reference will now be made in detail to the embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to the like elements throughout. The embodiments are described below to explain the present invention by referring to the figures.

Hereinafter, embodiments of the present invention will be described in detail with reference to the appended drawings. In this specification, "interactive data" refers to data recorded to support an interactive mode and includes a markup document recorded with a markup language and/or a script code, a script code file linked with a markup document or provided separately, a program file, an audio file, an animation file, and an image file as resource files, etc., to be linked with a markup document and displayed with the markup document. That is, the interactive data acts as additional contents being provided with AV data, as well as acts as an application program required to reproduce the AV data in an interactive mode.

FIG. 1 shows a reproduction system according to an embodiment of the present invention. Referring to FIG. 1, the reproduction system comprises an enhanced AV (ENAV) disk 100 as an information storage medium that supports an interactive mode, a reproducing apparatus 200, a display apparatus 300, for example a TV, and a remote controller 400 as a user input device. The remote controller 400 receives a control command input from a user and transfers it to the reproducing apparatus 200. The reproducing apparatus 200 reproduces AV data recorded on the ENAV disk 100. If the ENAV disk 100 is loaded in a DVD drive included in the reproducing apparatus 200 and a user selects an interactive mode, the reproducing apparatus 200 reproduces the ENAV disk 100 in the interactive mode and transfers reproduced data to the display apparatus 300. The display apparatus 300 displays both an AV picture corresponding to the reproduced AV data and an interactive picture obtained from an interactive application. "Interactive mode" refers to a method of displaying an AV picture on a display

window defined in a markup document as an interactive application, that is, a method of displaying both an AV picture and an interactive picture in a manner that the AV picture is embedded in the interactive picture. Here, the AV picture represents a picture in which DVD-Video data recorded on the ENAV disk 100 is reproduced by the reproducing apparatus 200 and is displayed on the display apparatus 300. The interactive picture represents a picture in which an interactive application recorded on the ENAV disk 100 is interpreted and executed by the reproducing apparatus 200 and is displayed on the display apparatus 300. Meanwhile, "video mode" refers to a method of reproducing AV data according to a method defined in a conventional DVD-Video, that is, a method of displaying only an AV picture obtained by reproducing the corresponding AV data. In this embodiment, the reproducing apparatus 200 supports both the interactive mode and the video mode. Furthermore, the reproducing apparatus 200 can receive AV data and/or interactive data through a network.

The reproducing apparatus 200 has a system parameter table containing system parameters (SPRMs). The system parameter table includes player language information. The reproducing apparatus 200 selects interactive data to be used in the interactive mode with reference to the player language information. The SPRMs may be stored in a memory in the reproducing apparatus 200.

The disk 100 also stores language information indicating a language used in the contents of the stored interactive data. The language information recorded on the disk is substantially the same as the player language information stored in SPRMs, however, the disk language information is different from the player language information in that the disk language information is recorded on the disk 100 and indicates corresponding interactive data.

When the interactive mode is selected, the reproducing apparatus 200 reads language information recorded on the ENAV disk 100, compares the read language information with its own player language information stored as a system parameter, and performs reproduction using interactive data selected according to the compared result.

FIG. 2 is a view explaining the operations of the ENAV disk 100. Referring to FIG. 2, interactive data corresponding to language information is recorded on the ENAV disk 100. That is, interactive data #1 corresponding to language information #1 exists, interactive data #2

corresponding to language information #2 exists, ..., interactive data #n corresponding to language information #n exists, wherein n is an integer.

The language information (#1, #2, ..., #n) may be recorded separately from the interactive data (#1, #2, ..., #n) and can be linked with the interactive data (#1, #2, ..., #n), or can be recorded as one part of the interactive data (#1, #2, ..., #n).

If player language information set in the reproducing apparatus 200 is the same as the language information #2, the reproducing apparatus 200 gets the interactive data #2 corresponding to the language information #2 and reproduces corresponding AV data in an interactive mode. For example, if the player language information is "English", the reproducing apparatus 200 uses interactive data corresponding to language information "English" among interactive data recorded on the ENAV disk 100.

FIG. 3 shows a volume space of the ENAV disk 100 according to an embodiment of the present invention. Referring to FIG. 3, the volume space of the ENAV disk 100 includes a Volume and File structure area recording information related to volume and file, a DVD-Video Data area recording AV data or video titles in a DVD-Video format, and an ENAV file area recording ENAV files supporting an interactive mode.

The DVD-Video data area includes VIDEO_TS.IFO containing reproduction control information for all video titles recorded on the ENAV disk 100, VTS_01_0.IFO containing reproduction control information of a first video title, and VTS_01_0.VOB, VTS_01_1.VOB, ..., as AV data constructing video titles. VTS_01_0.VOB, VTS_01_1.VOB, ... are video titles, that is, video objects. Each VOB contains VOBU in which a navigation pack, a video pack, and an audio pack are packaged. The detailed construction of these data areas are disclosed in "DVD-Video for Read Only Memory Disc 1.0" of a conventional DVD-Video standard.

The ENAV file area stores an ENAV application consisting of a plurality of ENAV files. That is, the ENAV file area stores as the ENAV files, a startup file to be first read when an interactive mode is selected, a markup document corresponding to a selected video title, etc.

As such, the interactive data is recorded as a plurality of ENAV files. The ENAV files include the following: a markup document; a script code file; a program file; a style sheet designating a style of a markup document; and an audio file, animation file, an image file, etc.

as resource files to be linked with the markup document and be displayed along with the markup document, as described above.

FIG. 4 is a diagram illustrating a directory structure of the ENAV disk 100 according to an embodiment of the present invention. Referring to FIG. 4, a root directory has a DVD video directory VIDEO_TS and an ENAV directory DVD_ENAV storing ENAV data supporting an interactive mode.

The DVD video directory VIDEO_TS stores data described above with reference to FIG. 3, that is, VIDEO_TS.IFO, VTS_01_0.IFO, VTS_01_0.VOB, VTS_01_1.VOB, etc. The ENAV directory DVD_ENAV stores data described above with reference to FIG. 3, that is, a startup file STARTUP.MLS and other ENAV files.

FIG. 5 shows a relationship between the AV data and the ENAV files recorded on the ENAV disk 100 according to an embodiment of the present invention. Referring to FIG. 5, the ENAV disk 100 stores ENAV applications corresponding respectively to AV data, ensuring seamless reproduction. One ENAV application is a set of a plurality of ENAV files. To ensure seamless reproduction of AV data, an ENAV application corresponding to the AV data is buffered in advance before the AV data is reproduced in an interactive mode.

Each ENAV application includes one loading information file. The loading information file stores location information of ENAV files that is needed to reproduce the corresponding AV data in the interactive mode. The location information of ENAV files includes location information for ENAV files to be buffered in advance before the corresponding ENAV application is launched, that is, location information of ENAV files to be preloaded.

Because preloading is performed for each ENAV application, seamless reproduction is ensured for AV data corresponding to each ENAV application. Accordingly, in a view of a user interface, a contents provider makes ENAV applications in a manner that one ENAV application corresponds to 1 piece of video title or 1 chapter of video title in order to ensure seamless reproduction.

Meanwhile, as a contrast to preloading, post-loading is to buffer a desired ENAV file after a corresponding ENAV application is launched. One ENAV application does not always include an ENAV file to be post-loaded. If post-loading is needed, post-load information

required with post-loading, i.e., location information of ENAV files to be post-loaded, is recorded on the loading information file.

FIG. 6 is a block diagram of the reproduction apparatus 200 according to an embodiment of the present invention. Referring to FIG. 6, the reproduction apparatus 200 includes a reader 1, an AV reproducing engine 2, and an ENAV engine 3.

The reader 1 reads AV data, i.e., DVD-Video data and ENAV files from the DVD 100 according to a control signal sent from the ENAV engine 3. The AV reproducing engine 2 reproduces the AV data read by the reader 1. Because the AV data is DVD-Video data, the AV reproducing engine 2 is implemented by a DVD-Video reproduction engine reproducing DVD-Video data. The AV reproducing engine 2 is communicated with the ENAV engine 3 through an Application Program Interface (API). That is, the AV reproducing engine 2 informs the ENAV engine 3 of a property indicating a status of the AV reproducing engine 2 in response to a request sent from the ENAV engine 3, and sends a trigger to the ENAV engine 3. For example, in a case where a corresponding quiz is displayed on an interactive screen simultaneously with a battle scene while a movie, such as "Starwars," is shown in an interactive mode, the trigger informs the ENAV engine 3 of related information when the battle scene is displayed.

The ENAV engine 3 reproduces the ENAV files. Particularly, in the present embodiment, the ENAV engine 3 verifies, interprets, and executes a markup document as an ENAV file in order that the DVD-Video data recorded on the DVD 100 can be reproduced in the interactive mode. Also, the ENAV engine 3 blends and outputs a reproduced DVD-Video stream and an interpreted markup document. Accordingly, a picture in which an AV picture is embedded in an interactive picture is displayed on the display apparatus 300. Meanwhile, the ENAV engine 3 can include various plug-ins. Plug-ins are used to open various formats of files included in the markup document or linked with the markup document. For example, to reproduce AV data for a window media player, the ENAV engine 3 can call up the window media player. Also, the ENAV engine 3 accesses a network and can get desired information such as the ENAV file.

Particularly, in the present embodiment, the ENAV engine 3 parses language information recorded on a startup file, compares the language information with player language information recorded on a system parameter table, and selects a corresponding loading

information file according to the compared result. The loading information file includes a list of ENAV files that should be buffered in advance or during reproducing for seamless reproduction. The ENAV engine 3 buffers ENAV files according to a selected loading information file in a buffer (not shown) included in the ENAV engine 3 and then interprets and executes from an initial file of the ENAV files.

FIG. 7 shows a startup file STARTUP.MLS according to an embodiment of the present invention. Referring to FIG. 7, the startup file STARTUP.MLS being a markup document written in a markup language includes two elements: one is a "walledgarden" element and the other is a "loadinginfo" element.

The "walledgarden" element includes links to a walled garden list file that lists a network area allowing access through an inserted ENAV disk 100, or files allowing access according to a parental level. The "walledgarden" element may or may not be recorded on the start up file.

The "loadinginfo" element includes links to a loading information file indicating location information for ENAV files belonging to an ENAV application, in order to load the ENAV application which is a set of ENAV files required when reproducing data in the interactive mode. By using a "condition" element included in the "loadinginfo" element, condition information selecting one among a plurality of ENAV applications is recorded. In more detail, the condition information selecting the ENAV application is recorded using a "name" property and a "value" property included in the "condition" element.

The startup file shown in FIG. 7 includes two "loadinginfo" elements. A reference number A indicates a part on which a first "loadinginfo" element is recorded and a reference number B indicates a part on which a second "loadinginfo" element is recorded. The "name" and "value " property values of the "condition" element included in the first "loadinginfo" element are recorded as "lang" and "en" respectively, to indicate that the contents of an ENAV file included in an ENAV application referred to by the first "loadinginfo" element is made with English. The "name" and "value" property values of the "condition" element included in the second "loadinginfo" element are recorded as "lang" and "kr", respectively, to indicate that the contents of an ENAV file constructing a referred ENAV application is made with Korean. The

application language is expressed by lower case English letters consisting of two characters as defined in ISO-639.

FIG. 8 shows a startup file STARTUP.MLS according to another embodiment of the present invention. Referring to FIG.8, the startup file STARUP.MLS includes two elements: one is a "walledgarden" element and the other is an "application" element. The "walledgarden" element has the same meaning as in FIG. 7.

The "application" element includes links to a loading information file indicating location information for ENAV files belonging to an ENAV application, in order to load the ENAV application which is a set of ENAV files required when reproducing data in the interactive mode. A "condition" element included in the "application" element is used to record a condition selecting one among a plurality of ENAV applications to which the startup file is linked. A "param" element included in the "condition" element is used to represent a property value that provides a selection criterion selecting a corresponding ENAV application. In more detail, the condition information selecting the ENAV application is recorded using a param "name" property and a "value" property included in the "condition" element.

A reference number C represents an ENAV application referred by a first "application" element and a reference number D represents an ENAV application referred by a second "application" element. The ENAV application referred by the first "application" element indicates that contents included in the corresponding ENAV file are made with English. The ENAV application referred by the second "application" element indicates that contents included in the corresponding ENAV file is the same as in the first application, except it is made with Korean. The application language is expressed by lower case English letters consisting of two characters as defined in an ISO-639 standard.

A conventional interactive mode has not considered that a readable language is different according to users. However, the present invention provides a plurality of interactive data, the contents of which are each made with a different language, considering that a readable language is different according to users, and allows a user to select one among the plurality of interactive data. Furthermore, because language information selecting an ENAV application is recorded on a startup file, the reproducing apparatus 200 can select an ENAV

application corresponding to predetermined player language information when being first operated.

FIG. 9 shows a system parameter table storing language information, according to an embodiment of the present invention. Referring to FIG. 9, the system parameter table is stored in the reproducing apparatus 200. System parameters 0 through 20 are implemented using a system parameter table according to System Parameters (SPRMs) defined in a DVD-Video standard (DVD specifications for Read-Only Disc Part 3 Video Specifications), considering compatibility. In more detail, one among the system parameters included in the system parameter table can be used as language information, or a new format of system parameter table can be implemented by adding the player language information to the system parameter table. A value having a fixed length of 2 bytes is stored in SPRM and each parameter has a 16-bit integer value. Detailed descriptions for SPRMs 0 through 20 are disclosed in the DVD-Video standard and therefore the descriptions for parameters without direct-relation to the present invention are omitted.

Case where SPRM 0 is used as player language information according to the present invention:

SPRM 0 stores information of a language that a user uses to create a DVD-Video menu. The reproducing apparatus 200 compares a value set in SPRM 0 with language information recorded on an ENAV disk 100, and can select an ENAV application created with the same language as the menu, as an ENAV application to be first executed.

Case where SPRM 16 is used as player language information according to the present invention:

The value of SPRM 16 can be changed only when the reproducing apparatus is initialized and cannot be changed while the reproducing apparatus is being reproduced or operated. SPRM 16 stores language information of an audio stream to be reproduced simultaneously when a DVD-Video is reproduced, in a format defined in the ISO-639 standard. Therefore, the reproducing apparatus 200 can select an ENAV application to be first executed, with reference to the value set in SPRM 16.

Case where SPRM 18 is used as player language information according to the present invention:

The value of SPRM 18 also can be changed only when the reproducing apparatus is initialized and cannot be changed while the reproducing apparatus is being reproduced or operated. SPRM 18 stores language information displaying a caption of a DVD-Video, in a format defined in the ISO-639. In most cases, users see a caption of a movie made with their local language while hearing an audio of an original language used where the movie is made. Accordingly, the reproducing apparatus 200 selects an ENAV application, the contents of which are made with the same language as the caption, with reference to the language information displaying the caption in the DVD-Video. That is, the reproducing apparatus 200 selects the ENAV application with reference to the values stored in SPRM 18.

Case where player language information according to the present invention is recorded on SPRM 21:

According to the DVD-Video standard, SPRMs 21 through 23 are reserved areas. Accordingly, the present embodiment records the player language information (Initial Language Code) in a format defined in the ISO-639 standard on one among the empty SPRMs, for example, on SPRM 21. The value of SPRM 21 can also be changed only when the reproducing apparatus is initialized and cannot be changed while the reproducing apparatus is being reproduced or operated.

FIG. 10 is a view explaining the data structure of the player language information recorded as the system parameter of FIG. 9. Referring to FIG. 10, the player language information is recorded using 2 bytes allocated to SPRM 21. The remaining bits not used in recording the language information thereon are reserved and can be used to store other information. SPRM 21 can be recorded in a format defined in the ISO-639 standard or according to other standards.

FIG. 11 is a flowchart explaining a reproduction method according to an embodiment of the present invention. Referring to FIG. 11, if an ENAV disk 100 is loaded in a reproducing apparatus 200, the reproducing apparatus 200 checks a startup file stored in a directory DVD_ENAV and determines whether the loaded disk is an ENAV DVD 100 (operation 1101). If the reproducing apparatus 200 cannot find a startup file, the reproducing apparatus 200

determines whether the loaded disk is a conventional DVD-Video disk (operation 1102). If the loaded disk is a DVD-Video disk, the reproducing apparatus 200 reproduces the disk in a video mode (operation 1103). The reproducing apparatus 200 does not reproduce the disk if the disk is another type of disk.

If the reproducing apparatus 200 finds a startup file and determines that the loaded disk is the ENAV disk 100 (operation 1101) and if a user selects a video mode, the reproducing apparatus 200 reproduces the loaded disk in the video mode (operation 1103). If the user selects an interactive mode (operation 1104), the reproducing apparatus 200 reads the startup file (operation 1105), reads language information recorded on the startup file, and reads a loading information file corresponding to player language information recorded on a system parameter table (operation 1106). Then, the reproducing apparatus 200 buffers ENAV files listed in the read loading information file (operation 1107), interprets and executes from a first ENAV file, and reproduces selected AV data in the interactive mode (operation 1108).

As described above, the present invention provides an information storage medium, having a data structure capable of selecting additional contents made with a language selected by a user or with a predetermined language and reproducing AV data in an interactive mode when an information storage medium storing AV data is reproduced, and a reproducing apparatus and reproducing method thereof.

Therefore, the reproducing apparatus can select an ENAV application to be first executed in the interactive mode and reproduce the selected ENAV application with a language readable by a user.

Although a few embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents.

Industrial Applicability

Meanwhile, the above-described reproducing method may be embodied as a program on a computer readable medium including, but not limited to storage media, such as magnetic

storage media (e.g., ROM's, floppy disks, hard disks, etc.), optically readable media (e.g., CD-ROMs, DVDs, etc.) and carrier waves (e.g., transmissions over the Internet).

What is claimed is:

1. An information storage medium, comprising:

audio visual (AV) data;

interactive data, which is displayed along with an AV picture obtained from the AV data, and provides contents related to the AV picture, when the AV data is reproduced in an interactive mode; and

language information which indicates a language of the contents contained in the interactive data.

2. The information storage medium of claim 1, wherein the interactive data includes a startup file to be first read when the interactive mode is selected, and the language information is recorded in the startup file.

3. The information storage medium of claim 1, wherein a reproducing apparatus that reproduces the AV data in the interactive mode refers to the language information to select interactive data.

4. The information storage medium of claim 1, wherein the language information is compared with a system parameter SPRM 0 set according to a DVD-Video standard in a reproducing apparatus that reproduces the AV data in the interactive mode.

5. An information storage medium comprising:

audio visual (AV) data;

a plurality of enhanced audio visual (ENAV) applications, each of which includes substantially similar contents and is made with a different language from the other ENAV applications, in order to reproduce the AV data in an interactive mode; and

language information which is read to select one among the plurality of ENAV applications.

6. The information storage medium of claim 5, wherein the language information is recorded in a startup file to be first read when the interactive mode is selected.

7. The information storage medium of claim 5, wherein the language information is compared with a system parameter SPRM 0 set according to a DVD-Video standard in a reproducing apparatus that reproduces the AV data in the interactive mode.

8. The information storage medium of claim 5, wherein the language information is recorded using an element which links a loading information file included in a corresponding one of the ENAV applications.

9. The information storage medium of claim 8, wherein the language information is recorded in an element that stores a condition selecting a linked loading information file included in the element which links the loading information file.

10. The information storage medium of claim 8, wherein the language information is recorded using a "name" property and a "value" property in an element that stores a condition selecting a linked loading information file included in the element which links the loading information file.

11. The information storage medium of claim 8, wherein the language information is recorded using a "name" property and a "value" property in the element that links the loading information file.

12. The information storage medium of claim 8, wherein the language information is recorded in a language code with two characters according to an ISO 639 standard.

13. The information storage medium of claim 8, wherein the loading information file informs location information of ENAV files belonging to a corresponding one of the ENAV applications.

14. A reproducing apparatus comprising:
an audio visual (AV) reproducing engine which decodes AV data; and

an enhanced audio visual (ENAV) engine, which includes player language information selecting one among a plurality of ENAV applications, each of which includes substantially similar contents and is made with a different language from the other ENAV applications, and interprets and executes the selected ENAV application with reference to the player language information in order to reproduce the AV data in an interactive mode.

15. The reproducing apparatus of claim 14, wherein the player language information is stored as a system parameter (SPRM).

16. The reproducing apparatus of claim 14, further comprising:

a reader reading the ENAV applications from an information storage medium, wherein the ENAV engine selects the one ENAV application with reference to the player language information and language information indicating a language of contents contained in the ENAV applications, the language information recorded in a startup file to be first read when the interactive mode is selected.

17. The reproducing apparatus of claim 14, further comprising:

a reader reading the ENAV application from an information storage medium, wherein the ENAV engine selects the one ENAV application with reference to a system parameter SPRM 0 set according to a DVD-Video standard and language information indicating a language of contents contained in the ENAV applications, the language information recorded in a startup file to be first read when the interactive mode is selected.

18. The reproducing apparatus of claim 16, wherein the information storage medium stores the language information and the plurality of ENAV applications, each of which includes the substantially similar contents and is made with the different language from the other ENAV applications, and the ENAV engine compares the language information with the player language information and selects one among the plurality of ENAV applications.

19. The reproducing apparatus of claim 18, wherein the ENAV engine compares the language information with the player language information stored in a system parameter table stored in the reproducing apparatus.

20. The reproducing apparatus of claim 18, wherein the ENAV engine compares the language information with a system parameter SPRM 0 set according to a DVD-Video standard in the reproducing apparatus.

21. The reproducing apparatus of claim 18, wherein the ENAV engine parses language information recorded using a "name" property and a "value" property in an element that stores a condition selecting a linked loading information file, included in an element that links a loading information file included in a corresponding one of the ENAV applications, and compares the language information with a system parameter SPRM 0 set according to a DVD-Video standard in the reproducing apparatus.

22. The reproducing apparatus of claim 18, wherein the language information comprises elements that each link a loading information file included in a corresponding one of the ENAV applications, and the ENAV engine parses the language information.

23. The reproducing apparatus of claim 22, wherein the element comprises a condition element storing a selection criterion to select one among the ENAV applications based on the ENAV engine parsing the language information.

24. The reproducing apparatus of claim 22, wherein the language information comprises a "name" property and a "value" property in a condition element that stores a condition selecting a linked loading information file included in the element linking the loading information file.

25. The reproducing apparatus of claim 22, wherein the language information is recorded using a "name" property and a "value" property in the element linking the loading information file.

26. The reproducing apparatus of claim 18, wherein the ENAV engine parses language information recorded in a language code with two characters according to an ISO 639 standard.

27. A reproducing method reproducing AV data in an interactive mode using a reproducing apparatus, the method comprising:

reading language information indicating a language used with contents contained in interactive data;

selecting and reading the interactive data made with the same language as player language information set in the reproducing apparatus with reference to the read language information; and

interpreting and executing the read interactive data.

28. The reproducing method of claim 27, wherein the reading the language information comprises opening a startup file first read when the interactive mode is selected and reading the language information.

29. The reproducing method of claim 27, wherein the reading the language information comprises reading language information recorded using an element linking a loading information file included in a corresponding enhanced audio visual (ENAV) application, from a startup file.

30. The reproducing method of claim 27, wherein the reading the language information comprises reading language information indicating respectively the language used in a plurality of ENAV applications, each of which includes substantially similar contents and is made with a different language from the other ENAV applications, in order to reproduce AV data in the interactive mode.

31. The reproducing method of claim 27, wherein the selecting and reading the interactive data comprises finding player language information set in the reproducing apparatus from a system parameter table stored as a system parameter in the reproducing apparatus.

32. The reproducing method of claim 27, wherein the selecting and reading interactive data comprises finding a system parameter SPRM 0 as player language information that is set according to a DVD-Video standard in the reproducing apparatus.

33. The reproducing method of claim 29, wherein the selecting and reading the interactive data comprises reading ENAV files belonging to the corresponding ENAV application with reference to a loading information file informing location information of the ENAV files belonging to the corresponding ENAV application.

34. The reproducing method of claim 29, wherein the reading the language information comprises comparing the language information with the player language information and selecting one among a plurality of ENAV applications.

35. The reproducing method of claim 29, wherein the reading the language information comprises parsing the language information recorded using the element linking the loading information file included in the corresponding ENAV application.

36. The reproducing method of claim 35, wherein the reading the language information comprising parsing the language information recorded in an element that stores a condition selecting a linked loading information file, included in the element linking the loading information file.

37. The reproducing method of claim 34, wherein the reading the language information comprising parsing the language information recorded using a "name" property and a "value" property in an element that stores a condition selecting a linked loading information file, included in the element linking the loading information file.

38. The reproducing method of claim 34, wherein the reading the language information comprises parsing the language information recorded using a "name" property and a "value" property in the element linking the loading information file.

39. The reproducing method of claim 29, wherein the reading the language information comprises parsing the language information recorded in a language code with two characters according to an ISO 639 standard.

40. An enhanced audio visual reproducing apparatus, comprising:
a reader which reads audio visual (AV) and interactive data from an optical disk;

a memory storing a system parameter table (SPRM) storing DVD video system parameters including player language information;

an AV reproducer which reproduces the AV data read from the optical disk; and

an ENAV engine selecting the read interactive data to reproduce from the optical disk corresponding to the AV data when the optical disk is reproduced in an interactive mode based on the player language information.

41. The reproducing apparatus of claim 40, wherein the ENAV engine buffers the selected interactive data corresponding to the AV data to ensure seamless reproduction.

42. The reproducing apparatus of claim 40, wherein the AV reproducer and the ENAV engine interface through an Application Program Interface (API).

43. The reproducing apparatus of claim 40, wherein when the optical disk is reproduced in the interactive mode the ENAV engine reads a startup file from the optical disk and selects corresponding interactive data from the optical disk based on the startup file.

44. The reproducing apparatus of claim 43, wherein the ENAV engine parses language information from the startup file and compares the parsed language information with the player language information thereby selecting a corresponding loading file indicating interactive data files to be buffered.

45. The reproducing apparatus of claim 40, wherein the interactive data comprises a plurality of enhanced audio visual (ENAV) data in a plurality of languages, respectively.

46. The reproducing apparatus of claim 45, wherein the ENAV data is selected automatically based on the SPRM.

47. The reproducing apparatus of claim 46, wherein the ENAV data is selected automatically based on an SPRM 0 table entry.

48. The reproducing apparatus of claim 46, wherein the ENAV data is selected automatically based on an SPRM 16 table entry.

49. The reproducing apparatus of claim 46, wherein the ENAV data is selected automatically based on an SPRM 18 table entry.

50. The reproducing apparatus of claim 46, wherein the ENAV data is selected automatically based on an SPRM 21 table entry.

51. A method of reproducing enhanced audio visual data from an optical disk, comprising:

detecting enhanced audio visual (ENAV) data on the optical disk when an interactive mode is selected;

reading language information from a startup file on the optical disk;

selecting ENAV data based on the read language information;

executing the selected ENAV data; and

reproducing corresponding audio visual data from the optical disk together with the selected ENAV data.

52. The method of claim 51, further comprising:

comparing the read language information with a player language information stored in a system parameter table.

53. The method of claim 51, wherein the reproducing comprises reproducing corresponding audio visual data from the optical disk together with the selected ENAV data in the interactive mode.

54. The method of claim 51, wherein the reproducing comprises reproducing corresponding audio visual data from the optical disk together with the selected ENAV data in a non interactive mode.