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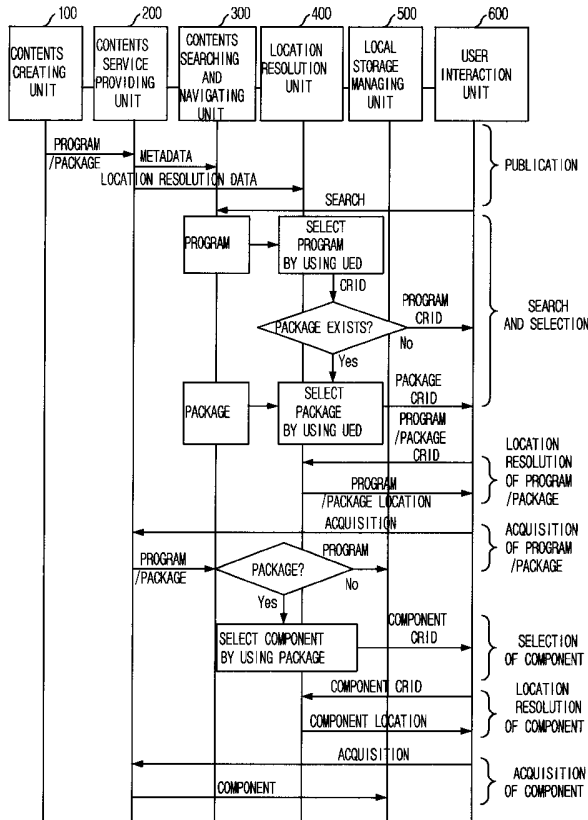
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(54) Title: APPARATUS AND METHOD FOR PROVIDING ADAPTIVE BROADCAST SERVICE USING USAGE ENVIRONMENT DESCRIPTION INCLUDING BIOGRAPHIC INFORMATION AND TERMINAL INFORMATION



(57) Abstract: Provided is an adaptive broadcasting service providing apparatus using UED information including biographic information and terminal information. The apparatus can provide a targeting function for selecting AV program, package or components of the package based on a user consumption environment and preference by defining biographic information and terminal information for describing characteristic information for personal biographic information and terminal information, and adding the biographic information and terminal information to the UED information. The apparatus includes: a contents providing unit for publishing and providing the broadcasting contents and metadata including the UED information to the user terminal; and a contents searching unit for providing contents identification information upon a search and selection signal from the user terminal, wherein the UED information describes a consumption environment of the contents and includes: biographic information for describing characteristics of user's biographic information; and terminal information for describing characteristic information of the user terminal.

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APPARATUS AND METHOD FOR PROVIDING ADAPTIVE BROADCAST
SERVICE USING USAGE ENVIRONMENT DESCRIPTION INCLUDING
BIOGRAPHIC INFORMATION AND TERMINAL INFORMATION

5

Description

Technical Field

The present invention relates to an apparatus and
method for providing an adaptive broadcasting service using
10 Usage Environment Description (UED) information; and, more
particularly, to an adaptive broadcasting service providing
apparatus using UED information including biographic
information and terminal information to provide a targeting
function in an adaptive broadcasting system such as a TV-
15 Anytime (TVA) system, and a method thereof.

Background Art

As broadcasting is digitalized, broadcasting
20 environments are rapidly changing from conventional
unidirectional broadcasting into complex forms such as
accommodation of diverse reception terminals through a
linkage between a broadcasting network and a communication
network as well as multimedia and multi-channels. Also,
25 increasing number of viewers who used to inactively receive
broadcasting programs in a limited range of channels, want
to directly participate in a broadcasting service or
receive/watch desired programs at desired time.

It can be summarized that the broadcasting
30 environments evolve into complexly and diversely
personalized forms. In the complex, diverse and new
broadcasting environments, an adaptive broadcasting makes
it possible that the viewers conveniently and efficiently
consume desired broadcasting contents in forms which fit to
35 the preferences of the viewers at desired time with diverse

terminals. That is, the adaptive broadcasting provides adaptive broadcasting contents, which fit to a usage environment including user preference, terminal performance, network characteristics and a natural environment such as time, place and user's feeling.

The TV-Anytime forum is a group for defining a standard for the adaptive broadcasting. The TV-Anytime forum is a private standard organization established in September 1999 to establish a standard for providing services related to audio and visual in a user environment having a Personal Digital Recorder (PDR).

The standard for the adaptive broadcasting in the TV-Anytime forum is divided into a Phase 1, i.e., TVA-1 and a Phase 2, i.e., TVA-2 in the respect of an assumed system environment and major functions to be provided.

The TVA-1 provides application services such as search, selection, acquisition and consumption of audio/video (AV) contents based on Personal Digital Recorder (PDR) in an environment where a main broadcasting program is transmitted through a unidirectional broadcasting channel and additional metadata can be acquired through a bi-directional network.

The metadata means descriptive data for contents such as a program title, genre and overview, and they are generally defined as data about data.

The TVA-2 extends the consumption environment of the TVA-1 assuming the unidirectional broadcasting channel and the bi-directional network. It provides a package, which can be identified and acquired as one selection unit, by integrating media components having diverse forms such as an application program, an advertisement, an image, a text as well as an AV program, which is an important service object of the TVA-1 in a home network environment.

The package describes information on the package and its components, and provides a targeting function for

selecting components from the package based on a consumption environment and user preference and a synchronizing function for accurate consumption through description on temporal/spatial relationship.

5 Also, the TVA system provides a targeting function for selecting the provided AV program, package, components of the package according to the consumption environment and the user preference.

10 Herein, it is required to minutely and clearly define and use the description information for describing usage environment such as terminal characteristic information or user characteristic information in detail to efficiently provide the targeting function.

15 Disclosure
Technical Problem

20 It is, therefore, an object of the present invention to provide an adaptive broadcasting service providing apparatus which can provide an advanced targeting function for selecting Audio/video (AV) program, package or components of the package based on a user consumption environment and preference by defining biographic and terminal information for describing characteristic information for personal biographic information and terminal information, and adding the biographic and terminal information to Usage Environment Description (UED) information.

25 Other objects and advantages of the invention will be understood by the following description and become more apparent from the embodiments in accordance with the present invention, which is set forth hereinafter. It will be also apparent that objects and aspects of the invention can be embodied easily by the means defined in the claims
30 and combinations thereof.
35

Technical Solution

5 In accordance with one aspect of the present invention,
there is provided an adaptive broadcasting service
providing apparatus using Usage Environment Description
(UED) information and providing a targeting function for
selecting an audio/video (AV) program, a package or
10 components of the package based on a consumption
environment and user preference, in an adaptive
broadcasting system for providing broadcasting contents
including AV programs and packages to a user terminal, the
apparatus including: a contents providing unit for
publishing and providing the broadcasting contents and
15 metadata including the UED information to the user
terminal; and a contents searching unit for providing
contents identification information corresponding to a
search and selection signal inputted from the user terminal,
wherein the UED information describes a consumption
20 environment of the contents and includes: biographic
information for describing characteristics of user's
biographic information; and terminal information for
describing characteristic information of the user terminal.

In accordance with another aspect of the present
25 invention, there is provided an adaptive broadcasting
service providing method using UED information and
providing a targeting function for selecting an AV program,
a package or components of the package based on a user
consumption environment and preference, in an adaptive
30 broadcasting system for providing broadcasting contents
including AV programs and packages to a user terminal,
including the steps of: a) publishing metadata including
the broadcasting contents and the UED information to the
user terminal; b) providing contents identification
35 information corresponding to a search and selection signal

transmitted from the user terminal; c) determining physical location of the broadcasting contents based on the contents identification information and providing location information; and d) providing the broadcasting contents based on the location information, wherein the UED information describes a consumption environment of the contents and includes: biographic information for describing characteristics of user's biographic information; and terminal information for describing characteristic information of the user terminal.

In accordance with another aspect of the present invention, there is provided an adaptive broadcasting system using UED information, the system including: an adaptive broadcasting service providing apparatus for providing broadcasting contents including AV program and a package, and an adaptive broadcasting service supporting a synchronizing function and a targeting functions based on UED information; and a user terminal for receiving and consuming broadcasting contents and metadata from the adaptive broadcasting service providing apparatus, wherein the UED information describes a consumption environment of the contents and includes: biographic information for describing characteristics of user's biographic information; and terminal information for describing characteristic information of the user terminal.

In accordance with another aspect of the present invention, there is provided a user terminal for receiving broadcasting contents including an AV program and a package based on UED in an adaptive broadcasting system for providing an adaptive broadcasting service supporting a synchronizing function and a targeting function from an adaptive broadcasting service providing apparatus to the user terminal, including: a user interaction unit for searching, selecting and acquiring the broadcasting contents based on metadata including the UED information

published from the adaptive broadcasting service providing apparatus; a local storage managing unit for storing and managing the acquired broadcasting contents and metadata; and a contents presenting unit for presenting the
5 broadcasting contents and the metadata such that a user can watch, wherein the UED information describes a consumption environment of the contents and includes: biographic information for describing a characteristic of user's biographic information; and terminal information for
10 describing characteristic information of the terminal.

In accordance with another aspect of the present invention, there is provided a metadata scheme, including: UED information for a TV-Anytime (TVA) broadcasting service, wherein the UED information includes: biographic
15 information for describing a characteristic of user's biographic information; and terminal information for describing characteristic information of the user terminal.

Advantageous Effects

20 The present invention can provide an audio/video (AV) program, package or components of the package adaptively to diverse consumption environment and user preferences by improving description on usage environment of biographic and terminal information in an adaptive broadcasting system
25 such as a TV-Anytime (TVA) system. Also, the present invention can provide an advanced targeting function.

Description of Drawings

30 The above and other objects and features of the present invention will become apparent from the following description of the preferred embodiments given in conjunction with the accompanying drawings, in which:

35 Fig. 1 is a block diagram showing an entire adaptive

broadcasting system in accordance with an embodiment of the present invention;

Fig. 2 is a block diagram illustrating the adaptive broadcasting system in detail in accordance with the embodiment of the present invention; and

Fig. 3 is a flowchart describing an adaptive broadcasting service providing process using Usage Environment Description (UED) information in accordance with an embodiment of the present invention.

10

Best Mode for the Invention

Other objects and advantages of the present invention will become apparent from the following description of the embodiments with reference to the accompanying drawings. Therefore, those skilled in the art that the present invention is included can embody the technological concept and scope of the invention easily. In addition, if it is considered that detailed description on related art may blur the points of the present invention, the detailed description will not be provided herein. The preferred embodiments of the present invention will be described in detail hereinafter with reference to the attached drawings.

Fig. 1 is a block diagram showing an entire structure of an adaptive broadcasting system in accordance with an embodiment of the present invention.

As shown in Fig. 1, the adaptive broadcasting system of the present invention includes an adaptive broadcasting service providing apparatus 1000 and a user terminal 2000. The adaptive broadcasting service providing apparatus 1000 provides broadcasting contents including an audio/video (AV) program and a package, and an adaptive broadcasting service supporting a synchronizing function and a targeting function. The user terminal 2000 for consuming application services such as contents search, selection, acquisition,

35

and consumption based on contents and contents-related metadata from the adaptive broadcasting service providing apparatus 1000, which are connected to a network including a broadcasting channel/bi-directional IP network.

5 Fig. 2 is a block diagram illustrating the adaptive broadcasting system in detail in accordance with the embodiment of the present invention.

As shown in Fig. 2, the adaptive broadcasting service providing apparatus 1000 includes a contents creating unit 100, a contents service providing unit 200, a contents searching and navigating unit 300 and a location resolution unit 400, and the user terminal 2000 includes a user interaction unit 600 and a local storage managing unit 500 and it may further include a contents presenting unit (not shown) and a rights managing and protecting unit (not shown). Functions of each constituent element are as follows.

The contents creating unit 100 creates an AV program and a package. A studio, an entertainment company, a Web designer, or a user adaptive contents producer can manage the package creation work.

The contents service providing unit 200 reorganizes contents and metadata, inserts metadata and transmits contents, and terrestrial, satellite and cable broadcasting companies, Web casters or portal service providers can manage the work.

The contents searching and navigating unit 300 is based on broadcasting metadata published in Electronic Program Guide (EPG) for available contents. A contents searching and navigating function returns a contents identifier (CRID) of contents selected by a user or automatically selected by a terminal.

The location resolution unit 400 determines a physical location of contents including a channel and broadcasting time from the CRID acquired from the contents searching and

navigating unit 300.

The local storage managing unit 500 stores and manages broadcasting contents and metadata. The metadata can be managed in an Extensible Markup Language (XML) database (DB) or a relational DB. A function connecting metadata
5 between a user and a service provider in bi-directional corresponds to providing user history information and user preference information from the user.

The user interaction unit 600 drives constituent
10 elements based on a user input signal inputted from an input device of a user terminal, e.g., a key board, a remote controller, a mouse and a joystick.

The contents presenting unit (not shown) provides broadcasting contents and metadata to the user terminal
15 such that a user can use.

The rights managing and protecting unit (not shown) protects interface between the constituent elements based on a proper protecting/managing policy, which is revealed in "Bimetadata delivery protection" ETSI TS 102 822-5-1/2
20 and ETSI TS 102 822-7.

The above-mentioned embodiment is an example of the adaptive broadcasting system in a complete bi-directional broadcasting environment.

A method for realizing the adaptive broadcasting
25 system is largely divided into two based on a service environment. In a broadcasting environment having a sheer unidirectional broadcasting environment or a narrow-band bi-directional channel, only the contents creating unit and the contents service providing unit among the elements of
30 the adaptive broadcasting system exist in the outside of the user terminal, e.g., Personal Digital Recorder (PDR), and all elements except the contents creating unit and the contents service providing unit make a user be able to consume desired contents through search, selection,
35 location resolution and acquisition processes in the PDR.

Meanwhile, as described in the above embodiment, in a complete bi-directional broadcasting environment, the contents searching/navigating unit and the location resolution unit as well as the contents creating unit and the contents service providing unit among components of the adaptive broadcasting system can exist in the outside of the PDR. Therefore, the PDR includes only the user interaction unit, the contents presenting unit and the local storage managing unit, and makes a user be able to consume desired contents through search, selection, location resolution and acquisition processes through bi-directional connection to the contents service providing unit or the contents searching and navigating unit.

Fig. 3 is a flowchart describing an adaptive broadcasting service providing process using UED information in accordance with an embodiment of the present invention.

The adaptive broadcasting service providing process of the present invention basically includes the steps of publication, search, selection, location resolution, acquisition, view and finish.

When the AV program is provided, there are three operation scenarios. One is a case that the AV program is provided. Another is a case that the package is independent from the AV program. The other is a case that the package is dependent on the AV program based on whether provided contents are the AV program or the package, and whether the provided package is independent from or dependent on the AV program.

Publication

When an AV program is provided, the contents creating unit 100 creates the AV program. The contents service providing unit 200 publishes Content Reference Identifier (CRID) for identifying the AV program, attractive metadata

of the AV program, schedule information and location resolution data.

Herein, the attractive metadata and schedule information of the AV program are described as program
5 information (ProgramInformation) and program location (ProgramLocation) of a TVA-1 metadata schema.

The contents service providing unit 200 has a user be able to select an AV program that fits to an environment and preference of the user by publishing user environment
10 and preference, in which the AV program is properly consumed, based on the UED information in 'TargetingInformation' which is a sub element of the program information.

When a package to be provided is independent from the
15 AV program, the contents creating unit 100 creates only the package. The package is described based on a TVA-2 package schema and has a user be able to select a component which fits to an environment and preference of the user by publishing the proper user environment, in which components
20 of the package can be properly consumed, and preference based on terminal information for describing biographic information and characteristic information of a terminal for describing a characteristic of the biographic information of the user in 'TargetingInformation', which is
25 a sub element of a 'ContentsDescription' element.

The contents service providing unit 200 publishes the CRID for identifying the package, the package attractive metadata for inducing package consumption and approximate
30 schedule information of the package. Also, location resolution data for describing when and where the package can be acquired is published. As described above, the attractive metadata and the schedule information of the package are described as the program information (ProgramInformation) and program location (ProgramLocation)
35 of the TVA-1 metadata schema, just as a general AV program.

The contents service providing unit 200 has a user be able to select a package which fits to an environment and preference of the user, by publishing proper user environment, in which the package is properly consumed, and
5 preference based on biographic and terminal information of the present invention in 'TargetingInformation' i.e., a sub element of the 'ProgramInformation'.

Meanwhile, when the package to be provided is dependent on the AV program, the contents creating unit 100
10 creates an AV program and a package dependent on the AV program. The contents service providing unit 200 publishes the CRID for identifying the AV program, attractive metadata of the AV program, schedule information, location resolution information, link information of the package
15 connected to the AV program. Herein, the attractive metadata and the schedule information of the AV program are described as the program information and the program location of the TVA-1 metadata schema, and link information of the package connected to the AV program is described as
20 a 'RelatedMaterial' element of the program information of the AV program. The contents service providing unit 200 has a user be able to select an AV program which fits to an environment and preference of the user by publishing user environment in which the AV program is properly consumed,
25 and preference in 'TargetingInformation' i.e., a sub element of the program information based on the based on the biographic and terminal information. The homogeneous or heterogeneous contents service providing unit 200 publishes location resolution data for describing when and
30 where the CRID for identifying the package and the package can be acquired.

Search

When the AV program is provided, the contents
35 searching and navigating unit 300 provides the attractive

metadata and the schedule information of the AV program to the user through the EPG. Also, the EPG provides proper user environment, in which the AV program can be properly consumed, and preference information which are described in the 'TargetingInformation' based on the biographic and terminal information.

The user grasps the attractive metadata of the AV program such as the title, synopsis and actors of the AV program provided by the EPG, and searches the AV program to be consumed in the contents searching and navigating unit 300 by comparing the proper user environment and preference with the user's own environment and preference.

When the provided package is independent from the AV program, the EPG provides the package attractive metadata and the package schedule information to the user. Also, the EPG provides user environment, in which the package is properly consumed, and preference information by applying the UED information of the present invention in the 'TargetingInformation' based on the biographic and terminal information of the present invention.

The user grasps the package attractive metadata such as a package title, synopsis and actors provided by the EPG, and searches the package to be consumed by comparing the user environment, in which the package can be properly consumed, and preference with the user's own environment and preference.

When the provided package is dependent on the AV program, the EPG provides link information of the package connected to the AV program with the attractive metadata and the schedule information of the AV program. Also, the EPG provides the proper user environment, in which the AV program is properly consumed, and preference information which were described in the 'TargetingInformation' based on the biographic and terminal information.

The user grasps the attractive metadata of the AV

program such as the title, synopsis and actors of the AV program provided by the EPG, and searches the AV program to be consumed by comparing the proper user environment and preference, in which the AV program can be consumed, with
5 the user's own environment and preference.

When the user searches the AV program or watches the program through the EPG, the user acquires information on the package connected to the AV program.

10 Selection

When an AV program is provided and the user selects the AV program preferred by the user in the EPG, the user acquires the CRID of the AV program from the contents searching and navigating unit 300.

15 When the provided package is independent from the AV program, the user acquires the CRID of the package in case that he selects the package preferred by the user in the EPG.

When the provided package is dependent on the AV
20 program and the user selects the AV program preferred by the user in the EPG, the user acquires the CRID of the package connected to the AV program from a 'RelatedMaterial' element of 'ProgramInformation', which is the program information of the AV program.

25

Location Resolution

Both of the AV program and the package acquire physical location information of a real AV program and the package provided by the location resolution unit 400
30 through a location resolution mechanism from the CRID. The local storage managing unit 500 selects any one location among a plurality of contents locations including both channel and time informations to prevent collision during recording.

35

Acquisition

As an AV program or a package is acquired based on the selected location information including both channel information and time information.

5 When a package is acquired, the user grasps attractive metadata of the component of the package, and automatically or semiautomatically selects the entire or part of components to be consumed by comparing a user environment, in which the components can be properly consumed, and
10 preference information with user's own environment and preference in 'TargetingInformation' i.e., the sub element of the ContentDescription elements based on UED information including the biographic and terminal information of the present invention.

15 When components are selected, physical location information providing an actual component from the location resolution unit 400 is acquired from the CRID of each component through a location resolution mechanism.

20 View

When an AV program is acquired, the AV program is outputted into a user screen so that the user can use the AV program. When the package is acquired, the package is provided to the user after all components selected by the
25 user are acquired and screens are formed based on spatial/temporal relation information between components so that the user can use the package or the AV program.

Finishing

30 The AV program and package watching history information of the user is stored in a terminal and used to extract user's preference.

The biographic and terminal information of the UED information of the present invention will be described in
35 detail hereinafter.

The 'BioGraphicInformation' incorporates 'AgeGroup'. Since 'AgeGroup' can not be previously defined, the 'AgeGroup' is defined as 'ControlledTermType' of TVA. 'OtherFamilyMember' element is defined as
5 'ControlledTermType'. The 'AgeGroup' is a term for describing an age of a user within a predetermined range and the 'OtherFamilyMember' is a term for describing family member of the user.

An Extensible Markup Language (XML) syntax of
10 'BioGraphicInformation' of the present invention is as follows:

```
<complexType name="BioGraphicInformationType">
15 <sequence>
  <element name="Name" type="mpeg7:PersonNameType"
    minOccurs="0"/>
  <element name="Language" type="tva2:LanguageType"
    minOccurs="0"/>
20 <element name="BirthDate" type="mpeg7:TimeType"
    minOccurs="0"/>
  <element name="Age" type="mpeg7:unsigned8" minOccurs="0"/>
  <element name="AgeGroup" type="tva2:AgeRangeType"
    minOccurs="0"/>
25 <element name="OtherFamilyMember"
    type="tva:ControlledTermType" minOccurs="0"
    maxOccurs="unbounded"/>
  <element name="Gender" minOccurs="0">
    <simpleType>
30      <restriction base="NMTOKEN">
        <enumeration value="Male"/>
        <enumeration value="Female"/>
      </restriction>
    </simpleType>
35 </element>
```

</sequence>
</complexType>

5 Meanwhile, the terminal information of the UED
information of the present invention includes 'StorageType'
information.

 'StorageType' describes a characteristic of a single
storage unit and Moving Picture Experts Group (MPEG) 21
10 Document Library Services (DIA) can be used for describing
a storage.

 An XML syntax of the 'StorageType' is as follows:

15
<!-- ##### -->
<!-- Definition of Storage
 -->
<!-- ##### -->
20 <complexType name="StorageType">
 <sequence>
 <element name="StorageCharacteristic"
 type="dia:StorageCharacteristicsType"
25 minOccurs="0"
maxOccurs="unbounded"/>
 </sequence>
</complexType>

30 Semantics of 'StorageType' is shown in Table 1:

Table 1

| Name | Definition |
|------|------------|
|------|------------|

| | |
|-----------------------|--|
| StorageType | Tool for describing a characteristic of the storage unit |
| StorageCharacteristic | It describes a characteristic of the storage unit. |

The XML syntax of 'StorageCharacteristicsType' is as follows:

```

5
<!-- ##### -->
<!-- Definition of StorageCharacteristics -->
<!-- ##### -->
<complexType name="StorageCharacteristicsType">
10 <attribute name="inputTransferRate"
type="nonNegativeInteger" use="optional"/>
<attribute name="outputTransferRate"
type="nonNegativeInteger"
use="optional"/>
15 <attribute name="size" type="float" use="optional"/>
<attribute name="writable" type="boolean"
use="optional"/>
</complexType>

```

20 Semantics of the terms used in 'StorageCharacteristicsType' is shown in Table 2:

25 Table 2

| Name | Definition |
|----------------------------|--|
| StorageCharacteristicsType | Tool for describing storage characteristic of terminal |

| | |
|--------------------|---|
| inputTransferRate | It describes input transfer rate that storage can manage on a Mbytes basis |
| outputTransferRate | It describes output transfer rate that storage can accept on a Mbytes basis |
| Size | The size of storage is described on a Mbytes basis |
| Writable | It shows whether storage can record. |

An XML syntax of 'TerminalInformationType', which is a terminal information type, used after incorporating the 'StorageType' is as follows. A multi storage device is described in a single terminal based on a plurality of 'StorageTypes' in the 'TerminalInformationType'.

```

10 <complexType name="TerminalInformationType">
  <sequence>
    <element name="DecoderInformation"
      type="mpeg21:CodecCapabilityBaseType"
      minOccurs="0" maxOccurs="unbounded"/>
15 <element name="EncoderInformation"
      type="mpeg21:CodecCapabilityBaseType"
      minOccurs="0" maxOccurs="unbounded"/>
    <element name="DisplayInformation"
      type="mpeg21:DisplayType" minOccurs="0"
20     maxOccurs="unbounded"/>
    <element name="AudioInformation"
      type="mpeg21:AudioOutputType" minOccurs="0"
      maxOccurs="unbounded"/>
    <element name="InteractionInputInformation"
25     type="mpeg21:UserInteractionInputType"

```

```
        minOccurs="0" maxOccurs="unbounded"/>
<element name="StorageInformation"
type="mpeg21:StorageType" minOccurs="0"
    maxOccurs="unbounded"/>
5 <element name="SystemInformation"
type="tva2:SystemInformationType" minOccurs="0"/>
<element name="HardwareManufacturer"
type="tva2:HardwareManufacturerType"
    minOccurs="0"/>
10 <element name="TerminalType" type="tva:ControlledTermType"
minOccurs="0"/>
    </sequence>
<attribute name="terminalInformationId"
type="tva:TVAIDType" use="optional" />
15 </complexType>
```

20 To summarize the characteristics of the biographic information and terminal information in the UED information of the present invention described above, the 'BioGraphicInformation' includes the 'AgeGroup' and the 'OtherFamilyMember' as the 'ControlledTermTypes' and the 'TerminalInformation' is described by including the
25 'StorageType'.

As described in detail, the present invention can be embodied as a program and stored in a computer-readable recording medium, such as CD-ROM, RAM, ROM, a floppy disk, a hard disk and a magneto-optical disk. Since the process
30 can be easily implemented by those skilled in the art of the present invention, further description will not be provided herein.

While the present invention has been described with respect to certain preferred embodiments, it will be
35 apparent to those skilled in the art that various changes

and modifications may be made without departing from the scope of the invention as defined in the following claims.

Industrial applicability

5

The technology of the present invention is applied to a TV-Anytime (TVA) system.

What is claimed is:

1. An adaptive broadcasting service providing apparatus using Usage Environment Description (UED) information for providing a targeting function for selecting an audio/video (AV) program, a package or components of the package based on a consumption environment and user preference, in an adaptive broadcasting system providing broadcasting contents including AV programs and packages to a user terminal, comprising:

a contents providing means for publishing and providing the broadcasting contents and metadata including the UED information to the user terminal; and

15 a contents searching means for providing contents identification information corresponding to a search and selection signal inputted from the user terminal,

wherein the UED information describes a consumption environment of the contents and includes:

20 biographic information for describing characteristics of user's biographic information; and

terminal information for describing characteristic information of the user terminal.

25 2. The apparatus as recited in claim 1, wherein the contents providing means, includes:

a contents creating unit for creating targeting information using the biographic and terminal information, and creating metadata describing a proper user environment, in which the components of a package are properly consumed, and user preference.

3. The apparatus as recited in claim 2, wherein when a package independent from the AV program is provided, the contents creating unit creates only the package, or when a

package dependent on the AV program is provided, the contents creating unit creates the AV program and the package.

5 4. The apparatus as recited in claim 1, wherein the contents searching means provides metadata including the UED information based on Electronic Program Guide (EPG) so that the user can search the AV program or the package.

10 5. The apparatus as recited in claim 4, wherein the contents searching means provides functions that the user terminal grasp the AV program or package information based on the EPG, and searches for AV program or the package to be consumed by comparing the proper user environment, in
15 which the AV program or the package can be properly consumed, and preference with the user's own environment and preference based on metadata including the UED information.

20 6. The apparatus as recited in claim 1, wherein the biographic information includes:
 age group information for describing an age of the user; and
 family member information for describing family member
25 of the user.

 7. The apparatus as recited in claim 6, wherein the age group and the family member information are 'ControlledTermType' of TVA.

30 8. The apparatus as recited in claim 7, wherein the biographic information is described by including an Extensible Markup Language (XML) syntax:

35

```
<complexType name="BioGraphicInformationType">
  <sequence>
    <element name="Name" type="mpeg7:PersonNameType"
      minOccurs="0"/>
5    <element name="Language" type="tva2:LanguageType"
      minOccurs="0"/>
    <element name="BirthDate" type="mpeg7:TimeType"
      minOccurs="0"/>
    <element name="Age" type="mpeg7:unsigned8" minOccurs="0"/>
10    <element name="AgeGroup" type="tva2:AgeRangeType"
      minOccurs="0"/>
    <element name="OtherFamilyMember"
      type="tva:ControlledTermType" minOccurs="0"
      maxOccurs="unbounded"/>
15    <element name="Gender" minOccurs="0"/>
```

9. The apparatus as recited in claim 1, wherein the
20 terminal information includes storage information for
describing a characteristic of a storage unit.

10. The apparatus as recited in claim 9, wherein the
storage information is described by StorageType expressed
25 as an XML syntax:

```
<complexType name="StorageType">
30   <sequence>
     <element name="StorageCharacteristic"
       type="dia:StorageCharacteristicsType"
       minOccurs="0" maxOccurs="unbounded"/>
   </sequence>
35 </complexType>
```

11. An adaptive broadcasting service providing method using Usage Environment Description (UED) information for providing a targeting function for selecting an Audio video (AV) program, a package or components of the package based on a user consumption environment and preference, in an adaptive broadcasting system providing broadcasting contents including AV programs and packages to a user terminal, comprising the steps of:

5 a) publishing metadata including the broadcasting contents and the UED information to the user terminal;

b) providing contents identification information corresponding to a search and selection signal transmitted from the user terminal;

10 c) determining physical location of the broadcasting contents based on the contents identification information and providing location information; and

d) providing the broadcasting contents based on the location information,

15 wherein the UED information describes a consumption environment of the contents and includes:

biographic information for describing characteristics of user's biographic information; and

20 terminal information for describing characteristic information of the user terminal.

12. The method as recited in claim 11, further comprising the steps of:

30 e) creating targeting information using the biographic and terminal information, and creating metadata describing a proper user environment, in which the components of a package are properly consumed, and user preference.

13. The method as recited in claim 11, wherein the biographic information includes:

age group information for describing an age of the user; and

family member information for describing family member of the user.

5

14. The method as recited in claim 11, wherein the family member information is ControlledTermType of TV-Anytime (TVA).

10

15. The method as recited in claim 11, wherein the biographic information is described by including the XML syntax:

15

```
<complexType name="BioGraphicInformationType">
```

```
<sequence>
```

```
<element name="Name" type="mpeg7:PersonNameType"
minOccurs="0"/>
```

20

```
<element name="Language" type="tva2:LanguageType"
minOccurs="0"/>
```

```
<element name="BirthDate" type="mpeg7:TimeType"
minOccurs="0"/>
```

```
<element name="Age" type="mpeg7:unsigned8" minOccurs="0"/>
```

25

```
<element name="AgeGroup" type="tva2:AgeRangeType"
minOccurs="0"/>
```

```
<element name="OtherFamilyMember"
```

```
type="tva:ControlledTermType" minOccurs="0"
maxOccurs="unbounded"/>
```

30

```
<element name="Gender" minOccurs="0">
```

16. The method as recited in claim 11, wherein the terminal information includes storage information for describing a characteristic of a storage unit.

35

17. The method as recited in claim 16, wherein the storage information is expressed as the XML syntax:

```
5 <complexType name="StorageType">
      <sequence>
          <element name="StorageCharacteristic"
                type="dia:StorageCharacteristicsType"
                minOccurs="0" maxOccurs="unbounded"/>
10 </sequence>
</complexType>
```

18. An adaptive broadcasting system using Usage Environment Description (UED) information, comprising:

15 an adaptive broadcasting service providing apparatus for providing broadcasting contents including audio/video (AV) program and a package, and an adaptive broadcasting service supporting a synchronizing function and a targeting functions based on UED information; and

20 a user terminal for receiving and consuming broadcasting contents and metadata from the adaptive broadcasting service providing apparatus,

wherein the UED information describes a consumption environment of the contents and includes:

25 biographic information for describing characteristics of user's biographic information; and

terminal information for describing characteristic information of the user terminal.

30 19. The system as recited in claim 18, wherein the adaptive broadcasting service providing apparatus includes:

a contents providing means for publishing and providing the metadata including the UED information to the user terminal; and

35 a contents searching means for providing contents

identification information corresponding to a search and selection signal transmitted from the user terminal.

20. The system as recited in claim 18, wherein the
5 user terminal includes:

a user interaction unit for searching, selecting and acquiring the broadcasting contents based on the metadata including the UED information, and driving components of the user terminal to correspond to the user input signal;

10 a local storage managing unit for storing and managing the broadcasting contents and the metadata; and

a contents presenting unit for presenting the broadcasting contents and the metadata such that a user can watch.

15

21. The system as recited in claim 18, wherein the user terminal receives the package, grasps attractive metadata of components of the package, and automatically or semiautomatically selects entire or part components to be
20 consumed by comparing a user environment, in which the components are properly consumed, and user preference information based on the UED information.

22. The system as recited in claim 18, wherein the
25 biographic information includes:

age group information for describing an age of the user; and

family member information for describing family member of the user.

30

23. The system as recited in claim 18, wherein the terminal information includes storage information for describing a characteristic of a storage unit.

35 24. A user terminal for receiving broadcasting

contents including an audio/video (AV) program and a package based on Usage Environment Description (UED) in an adaptive broadcasting system for providing an adaptive broadcasting service supporting a synchronizing function and a targeting function from an adaptive broadcasting service providing apparatus to the user terminal, comprising:

5 a user interaction unit for searching, selecting and acquiring the broadcasting contents based on metadata including the UED information published from the adaptive broadcasting service providing apparatus;

10 a local storage managing unit for storing and managing the acquired broadcasting contents and metadata; and

15 a contents presenting unit for presenting the broadcasting contents and the metadata such that a user can watch,

wherein the UED information describes a consumption environment of the contents includes:

20 biographic information for describing characteristics of user's biographic information; and

terminal information for describing characteristic information of the user terminal.

25 25. The user terminal as recited in claim 24, wherein the user interaction unit grasps attractive metadata of components of the package, compares a user environment, in which the described components are properly consumed, and preference information with its own environment and preference based on UED information, and automatically or semiautomatically selects entire or part components to be consumed.

26. The user terminal as recited in claim 24, wherein the biographic information includes:

35 age group information for describing an age of the

user; and

family member information for describing family member
of the user.

5 27. The user terminal as recited in claim 24, wherein
the terminal information includes storage information for
describing a characteristic of a storage unit.

28. A metadata scheme, comprising:

10 UED information for a TV-Anytime (TVA) broadcasting
service,

wherein the UED information includes:

 biographic information for describing a characteristic
of user's biographic information; and

15 terminal information for describing characteristic
information of the user terminal.

FIG. 1

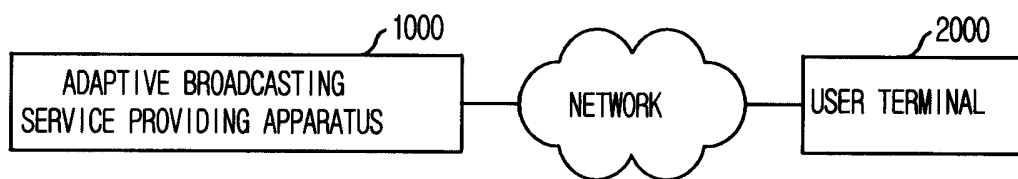


FIG. 2

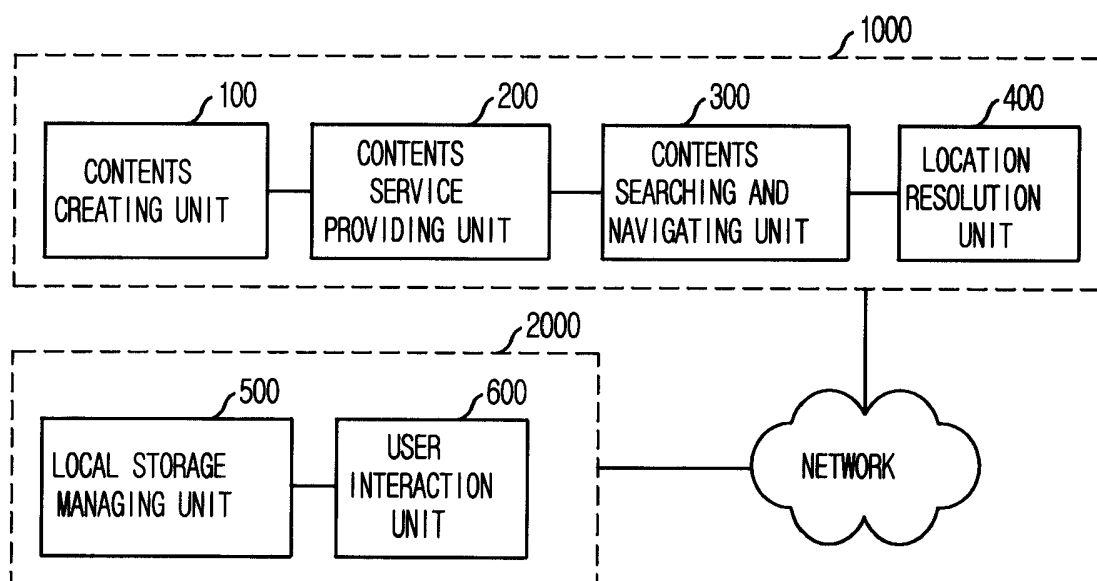
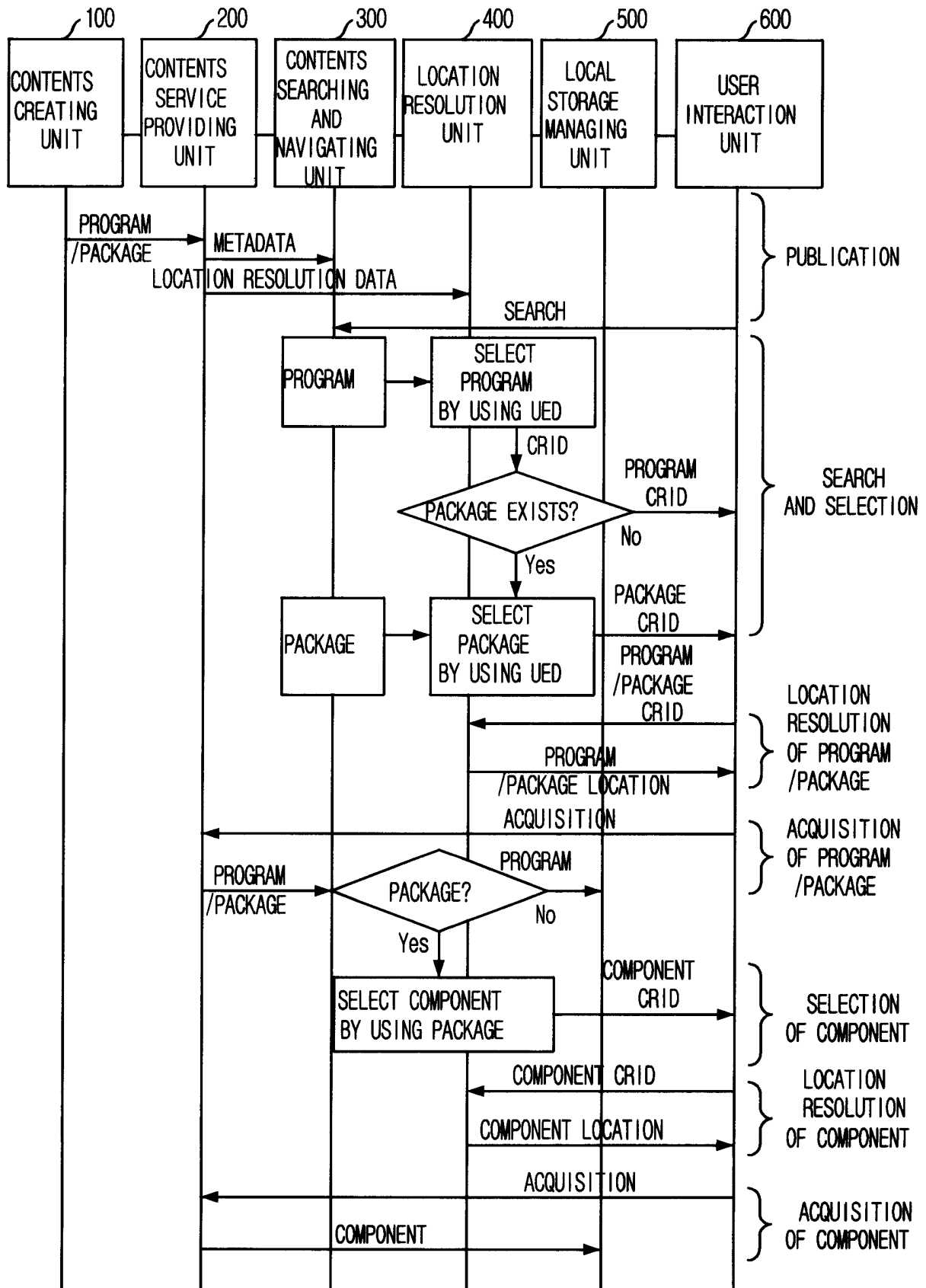


FIG. 3



PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | |
|---|--|--|
| Applicant's or agent's file reference P05EA073PCT | FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below. | |
| International application No. PCT/KR2006/000059 | International filing date (<i>day/month/year</i>) 06 JANUARY 2006 (06.01.2006) | (Earliest) Priority Date (<i>day/month/year</i>) 07 JANUARY 2005 (07.01.2005) |
| Applicant ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE et al | | |

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (See Box No. II)

3. **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 3

as suggested by the applicant.

because the applicant failed to suggest a figure.

because this figure better characterizes the invention.

b. none of the figure is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2006/000059**A. CLASSIFICATION OF SUBJECT MATTER****H04N 7/08(2006.01)i**

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

Korean Patents and applications for inventions since 1975

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and application for Utility models since 1975

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

eKIPASS, SEARCH TERMS: TV-Anytime, UED, and similar terms

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:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

14 APRIL 2006 (14.04.2006)

Date of mailing of the international search report

18 APRIL 2006 (18.04.2006)

Name and mailing address of the ISA/KR

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Authorized officer

SHIN, Jae Chul

Telephone No. 82-42-481-8215



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International application No.

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