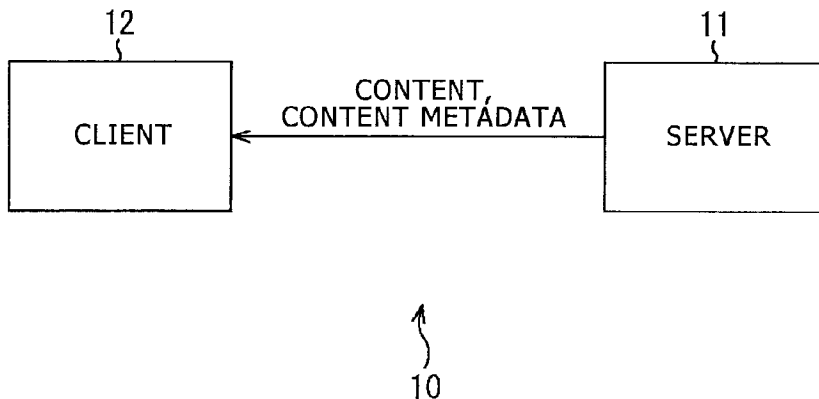




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 (72) Inventeurs/Inventors:
 YAMAGISHI, YASUAKI, JP;
 KITAZATO, NAOHISA, JP
 (73) Propriétaire/Owner:
 SONY CORPORATION, JP
 (74) Agent: GOWLING WLG (CANADA) LLP

(54) Titre : DISPOSITIF ET PROCEDE DE TRANSMISSION, DISPOSITIF ET PROCEDE DE RECEPTION ET SYSTEME DE TRANSMISSION ET DE RECEPTION
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(57) **Abrégé/Abstract:**

The present invention relates to a transmission apparatus and method, a reception apparatus and method, and a transmission and reception system by which content which meets the needs at the time can be acquired. A server 11 generates a script PDI-S for obtaining user side PDI-A representative of an answer of a user to a question about the tastes of the user, generates trigger information relating to execution of the PDI-S, and transmits the trigger information and the PDI-S to the client 12 in response to distribution of broadcasting content and transmits, in response to distribution of related content, provider side PDI-A representative of an answer set by a provider, to the question to the client 12. The client 12 executes the PDI-S based on the detection of the trigger information, and carries out matching between the user side PDI-A and the provider side PDI-A to determine acquisition of the related content distributed from the server 11. The present invention can be applied to a broadcasting system which broadcasts a digital television program.

[ABSTRACT]

The present invention relates to a transmission apparatus and method, a reception apparatus and method, and a transmission and reception system by which content which meets the needs at the time can be acquired.

A server 11 generates a script PDI-S for obtaining user side PDI-A representative of an answer of a user to a question about the tastes of the user, generates trigger information relating to execution of the PDI-S, and transmits the trigger information and the PDI-S to the client 12 in response to distribution of broadcasting content and transmits, in response to distribution of related content, provider side PDI-A representative of an answer set by a provider, to the question to the client 12. The client 12 executes the PDI-S based on the detection of the trigger information, and carries out matching between the user side PDI-A and the provider side PDI-A to determine acquisition of the related content distributed from the server 11. The present invention can be applied to a broadcasting system which broadcasts a digital television program.

[DESCRIPTION]

[Title]

TRANSMISSION APPARATUS AND METHOD, RECEPTION APPARATUS
AND METHOD AND TRANSMISSION AND RECEPTION SYSTEM

[Technical Field]

[0001]

The present invention relates to a transmission apparatus and method, a reception apparatus and method, and a transmission and reception system, and particularly to a transmission apparatus and method, a reception apparatus and method, and a transmission and reception system wherein content can be acquired in response to metadata.

[Background Art]

[0002]

In recent years, in accordance with digitalization of television broadcasting, the amount of information which can be broadcast at the same time has increased drastically. Therefore, various kinds of data are broadcast at the same time together with a television broadcast (content) which is viewed on the real time basis.

[0003]

Further, as a communication path of content, a

content download service has been proposed wherein the television broadcasting described above and the Internet through which data can be downloaded at a high speed are used properly (for example, refer to Patent Literature 1).

[0004]

Incidentally, in a general content download service, a filtering attribute (hereinafter referred to as filtering index, filtering metadata or the like) set in a server on the provider (content provider or service provider) side which provides (distributes) content is applied as metadata to content. Consequently, filtering (selection) of content in a client who receives (acquires) content is carried out.

[0005]

The filtering attribute is set as a value regarding an element of metadata selected from within a metadata set prescribed by a standardization organization such as ATSC (Advanced Television Standard Committee) or ARIB (Association of Radio Industries and Businesses).

[0006]

In particular, for example, content to which a filtering attribute that an "expected viewer" is selected as an element of metadata and "teen" is set as a value regarding the element of the metadata is applied is

provided to a client which carries out filtering so as to acquire "content for viewers 'whose expected viewer is teens.'" "

[Citation List]

[Patent Literature]

[0007]

[PTL 1]

Japanese Patent Laid-Open No. 2010-21988

[Summary]

[Technical Problems]

[0008]

However, metadata (filtering attribute) which is not included in the metadata set prescribed by a standardization organization is not applied to content.

[0009]

For example, even if the provider side desires to distribute "content for viewers 'whose expected viewer is teens' and besides 'who are interested in job hunting,'" if a metadata set prescribed by a standardization organization does not include "whether or not a viewer is interested in job hunting" as an element of the metadata, a filtering attribute that "a viewer is interested in job hunting" is set as an element of the metadata cannot be applied to content.

[0010]

Accordingly, the provider side cannot distribute content to which a matter of concern of a viewer is applied as metadata and which meets the needs at the time (for example, with a fashion taken into consideration).

[0011]

Further, in such a case as just described, the client side cannot carry out filtering so as to acquire content which meets the needs at the time.

[0012]

The present invention has been made in view of such a situation as described above, and it is an object of the present invention to make it possible to acquire content which meets the needs at the time.

[Solution to Problems]

[0013]

According to a first aspect of the present invention, there is provided a transmission apparatus which distributes content to a client, including:

script generation means for generating a script for obtaining user side answer information which is information representative of an answer of a user of the client to a question about the tastes of the user;

trigger generation means for generating trigger

information which is information relating to execution of the script by the client; and

transmission means for transmitting the trigger information and the script to the client in response to distribution of first content to the client and transmitting, in response to distribution of second content different from the first content to the client, provider side answer information which is information representative of an answer set by a provider providing the first or second content, to the question about the tastes of the user to the client.

[0014]

The transmission apparatus may further include metadata generation means for generating the metadata including the provider side answer information as the metadata of the second content corresponding to the answer set by the provider. The transmission means transmits the metadata to the client in response to the distribution of the second content to the client.

[0015]

The transmission apparatus may further include query generation means for generating a query indicative of a combination of answers to questions about the tastes of the user. The transmission means transmits the query

to the client in response to distribution of the second content to the client.

[0016]

According to the first aspect of the present invention, there is provided a transmission method for a transmission apparatus which distributes content to a client, including:

a script generation step of generating a script for obtaining user side answer information which is information representative of an answer of a user of the client to a question about the tastes of the user;

a trigger generation step of generating trigger information which is information relating to execution of the script by the client; and

a transmission step of transmitting the trigger information and the script to the client in response to distribution of first content to the client and transmitting, in response to distribution of second content different from the first content to the client, provider side answer information which is information representative of an answer set by a provider providing the first or second content, to the question about the tastes of the user to the client.

[0017]

In the first aspect of the present invention, a script for obtaining user side answer information which is information representative of an answer of a user of the client to a question about the tastes of the user may be generated, trigger information which is information relating to execution of the script by the client may be generated, and the trigger information and the script to the client in response to distribution of first content to the client may be transmitted, and, in response to distribution of second content different from the first content to the client, provider side answer information which is information representative of an answer set by a provider providing the first or second content, to the question about the tastes of the user may be transmitted to the client.

[0018]

According to a second aspect of the present invention, there is provided a reception apparatus which acquires content distributed from a server, including:

trigger detection means for detecting trigger information which is information which is transmitted from the server in response to distribution of first content and relates to execution of a predetermined script;

script execution means for executing a script for obtaining user side answer information which is transmitted from the server in response to the distribution of the first content and which is information representative of an answer of a user to a question about the tastes of the user based on detection of the trigger information; and

matching means for carrying out matching between the user side answer information and provider side answer information which is transmitted from the server in response to distribution of second content different from the first content and which is information representative of an answer set by a provider providing the first or second content to the question to determine acquisition of the second content distributed from the server.

[0019]

The matching means may carry out the matching to determine acquisition of the second content corresponding to metadata which includes the provider side answer information.

[0020]

The matching means may carry out the matching based on the user side answer information and a query indicative of a combination of answers transmitted from

the server in response to distribution of the second content and set by the provider to the questions to determine acquisition of the second content distributed from the server.

[0021]

The script execution means may execute the script for generating a query indicative of a combination of answers of the user to questions about the tastes of the user, and the matching means may carry out the matching based on the query and the provider side answer information transmitted from the server in response to the distribution of the second content to determine acquisition of the second content distributed from the server.

[0022]

According to the second aspect of the present invention, there is provided a reception method for a reception apparatus which acquires content distributed from a server, including:

a trigger detection step of detecting trigger information which is information which is transmitted from the server in response to distribution of first content and relates to execution of a predetermined script;

a script execution step of executing a script for obtaining user side answer information which is transmitted from the server in response to the distribution of the first content and which is information representative of an answer of a user to a question about the tastes of the user based on detection of the trigger information; and

a matching step of carrying out matching between the user side answer information and provider side answer information which is transmitted from the server in response to distribution of second content different from the first content and which is information representative of an answer set by a provider providing the first or second content to the question to determine acquisition of the second content distributed from the server.

[0023]

In the second aspect of the present invention, trigger information which is information which is transmitted from the server in response to distribution of first content and relates to execution of a predetermined script may be detected, a script for obtaining user side answer information which is transmitted from the server in response to the distribution of the first content and which is

information representative of an answer of a user to a question about the tastes of the user based on detection of the trigger information may be executed, and matching between the user side answer information and provider side answer information which is transmitted from the server in response to distribution of second content different from the first content and which is information representative of an answer set by a provider providing the first or second content to the question may be carried out to determine acquisition of the second content distributed from the server.

[0024]

According to a third aspect of the present invention, there is provided a transmission and reception system configured from a transmission apparatus which distributes content and a reception apparatus which acquires the content distributed from the transmission apparatus. The transmission apparatus includes script generation means for generating a script for obtaining user side answer information which is information representative of an answer of a user of the reception apparatus to a question about the tastes of the user, trigger generation means for generating trigger information which is information relating to execution of

the script by the reception apparatus, and transmission means for transmitting the trigger information and the script to the reception apparatus in response to distribution of first content to the reception apparatus and transmitting, in response to distribution of second content different from the first content to the reception apparatus, provider side answer information which is information representative of an answer set by a provider providing the first or second content, to the question about the tastes of the user to the reception apparatus. The reception apparatus includes trigger detection means for detecting the trigger information transmitted from the transmission apparatus in response to the distribution of the first content, script execution means for executing the script for obtaining the user side answer information transmitted from the transmission apparatus in response to the distribution of the first content based on the detection of the trigger information, and matching means for carrying out matching between the user side answer information and the provider side answer information transmitted from the transmission apparatus in response to distribution of the second content to determine acquisition of the second content distributed from the transmission apparatus.

[0025]

In the third aspect of the present invention, a script for obtaining user side answer information which is information representative of an answer of a user of the reception apparatus to a question about the tastes of the user may be generated, trigger information which is information relating to execution of the script by the reception apparatus may be generated, and the trigger information and the script may be transmitted to the reception apparatus in response to distribution of first content to the reception apparatus and, in response to distribution of second content different from the first content to the reception apparatus, provider side answer information which is information representative of an answer set by a provider providing the first or second content, to the question about the tastes of the user may be transmitted to the reception apparatus. The trigger information transmitted from the transmission apparatus in response to the distribution of the first content may be detected, the script for obtaining the user side answer information transmitted from the transmission apparatus in response to the distribution of the first content based on the detection of the trigger information may be executed, and matching between the user side

answer information and the provider side answer information transmitted from the transmission apparatus in response to distribution of the second content may be carried out to determine acquisition of the second content distributed from the transmission apparatus.

[Advantageous Effect of Invention]

[0026]

With the first to third aspects of the present invention, content which meets the needs at the time can be acquired.

[Brief Description of Drawings]

[0027]

[FIG. 1]

FIG. 1 is a block diagram showing an example of a configuration of a broadcasting system according to a first embodiment of the present invention.

[FIG. 2]

FIG. 2 is a block diagram showing an example of a hardware configuration of a server.

[FIG. 3]

FIG. 3 is a block diagram showing an example of a functional configuration of the server.

[FIG. 4]

FIG. 4 is a block diagram showing an example of a

functional configuration of a client.

[FIG. 5]

FIG. 5 is a flow chart illustrating a transmission and reception process of content.

[FIG. 6]

FIG. 6 is a view illustrating an example of syntax of an XML schema.

[FIG. 7]

FIG. 7 is a view illustrating an example of a PDI-Q.

[FIG. 8]

FIG. 8 is a view illustrating an example of a screen display in an interaction with a user.

[FIG. 9]

FIG. 9 is a view illustrating another example of a screen display in an interaction with a user.

[FIG. 10]

FIG. 10 is a view illustrating a further example of a screen display in an interaction with a user.

[FIG. 11]

FIG. 11 is a view illustrating a still further example of a screen display in an interaction with a user.

[FIG. 12]

FIG. 12 is a view illustrating a yet further example of a screen display in an interaction with a user.

[FIG. 13]

FIG. 13 is a view illustrating an example of a PDI-A.

[FIG. 14]

FIG. 14 is a view illustrating an example of a provider side PDI-A.

[FIG. 15]

FIG. 15 is a view illustrating another example of a provider side PDI-A.

[FIG. 16]

FIG. 16 is a block diagram showing another example of a functional configuration of the server.

[FIG. 17]

FIG. 17 is a flow chart illustrating a transmission and reception process of content.

[FIG. 18]

FIG. 18 is a block diagram showing another example of a functional configuration of the client.

[FIG. 19]

FIG. 19 is a flow chart illustrating a transmission and reception process of content.

[FIG. 20]

FIG. 20 is a block diagram showing an example of a configuration of a broadcasting system which carries out

broadcasting with an ATSC-M/H system and to which the present invention is applied.

[FIG. 21]

FIG. 21 is a view illustrating a protocol stack in a signal of a broadcasting wave transmitted by the ATSC-M/H system.

[FIG. 22]

FIG. 22 is a view illustrating a data configuration of Service Guide.

[FIG. 23]

FIG. 23 is a view illustrating a configuration of a Service fragment.

[FIG. 24]

FIG. 24 is a view illustrating a configuration of a Schedule fragment.

[FIG. 25]

FIG. 25 is a view illustrating a configuration of a Content fragment.

[FIG. 26]

FIG. 26 is a view illustrating a configuration of an Interactivity Data fragment.

[FIG. 27]

FIG. 27 is a view illustrating a protocol stack in a signal of a broadcasting wave transmitted by NRT

broadcasting.

[FIG. 28]

FIG. 28 is a view illustrating a data structure of a TVCT, a PAT, a PMT and a DSM-CC Addressable Section.

[FIG. 29]

FIG. 29 is a view showing data structures of SMT, NRT-IT and FLUTE FDT.

[FIG. 30]

FIG. 30 is a view illustrating an example of syntax of a PDI descriptor.

[FIG. 31]

FIG. 31 is a block diagram showing an example of a functional configuration of a server according to a second embodiment of the present invention.

[FIG. 32]

FIG. 32 is a block diagram showing an example of a functional configuration of a client according to the second embodiment of the present invention.

[FIG. 33]

FIG. 33 is a flow chart illustrating a transmission and reception process of content.

[FIG. 34]

FIG. 34 is a view illustrating another example of syntax of an XML schema.

[FIG. 35]

FIG. 35 is a view illustrating a configuration of trigger information.

[FIG. 36]

FIG. 36 is a view illustrating an example of a display image of broadcasting content.

[FIG. 37]

FIG. 37 is a view illustrating another example of a display image of broadcasting content.

[FIG. 38]

FIG. 38 is a view illustrating an example of a user side PDI-A.

[FIG. 39]

FIG. 39 is a view illustrating another example of a user side PDI-A.

[FIG. 40]

FIG. 40 is a view illustrating an example of a provider side PDI-A.

[FIG. 41]

FIG. 41 is a view illustrating another example of a provider side PDI-A.

[FIG. 42]

FIG. 42 is a view illustrating further example of a provider side PDI-A.

[FIG. 43]

FIG. 43 is a block diagram showing another example of a functional configuration of the server.

[FIG. 44]

FIG. 44 is a flow chart illustrating a transmission and reception process of content.

[FIG. 45]

FIG. 45 is a block diagram showing another example of a functional configuration of the client.

[FIG. 46]

FIG. 46 is a flow chart illustrating a transmission and reception process of content.

[FIG. 47]

FIG. 47 is a view illustrating a configuration of an Interactivity Data fragment.

[FIG. 48]

FIG. 48 is a view illustrating an example of syntax of a PDI descriptor.

[Description of Embodiments]

[0028]

In the following, embodiments of the present invention are described with reference to the drawings. It is to be noted that the description is given in the following order:

1. First Embodiment
2. Second Embodiment

[0029]

<1. First Embodiment>

[Example of Configuration of Broadcasting System]

FIG. 1 shows an example of a configuration of a broadcasting system according to an embodiment of the present invention.

[0030]

A broadcasting system 10 of FIG. 1 is configured from a server 11 provided on the provider side which broadcasts (provides) a digital television program (hereinafter referred to suitably as content) such as a broadcasting organization and a client terminal (hereinafter referred to simply as client) 12 provided in a house of a user who views broadcast content. It is to be noted that, while it is assumed that the client 12 is provided in each of a plurality of user houses, the client 12 may be configured as a portable terminal apparatus such as a portable telephone set or a PDA (Personal Digital Assistant).

[0031]

In the broadcasting system 10, the server 11 signals, together with content, content metadata about

the content as a signal of a digital broadcasting wave to the client 12. The client 12 carries out filtering of the content based on the content metadata signaled thereto together with the content to reproduce or accumulate only content desired by the user. It is to be noted that the content metadata may not be signaled together with the content but may be signaled before the content is signaled.

[0032]

[Example of Hardware Configuration of Server]

FIG. 2 shows an example of a hardware configuration of the server 11. In FIG. 2, the server 11 is configured, for example, on the basis of a computer.

[0033]

A CPU (Central Processing Unit) 12 executes various processes in accordance with a program stored in a ROM (Read Only Memory) 22 or a program loaded in a RAM (Random Access Memory) 23 from a storage section 28. In the RAM 23, data necessary for execution of the various processes by the CPU 21 and so forth are suitably stored.

[0034]

The CPU 21, ROM 22 and RAM 23 are connected to each other through a bus 24. Also an input/output interface 25 is connected to the bus 24.

[0035]

To the input/output interface 25, an inputting section 26 configured from a keyboard, a mouse and so forth, an outputting section 27 including a display unit configured from a CRT (Cathode Ray Tube), an LCD (Liquid Crystal Display) unit or the like and a speaker, the storage section 28 configured from a hard disk drive or the like and a communication section 29 configured from a modem, a terminal adapter or the like are connected. The communication section 29 communicates with an external apparatus through a network not shown. Further, a program may be acquired through the communication section 29 and stored into the storage section 28.

[0036]

A drive 30 is connected to the input/output interface 25 as occasion demands and a removable medium 31 such as a magnetic disk, an optical disk, a magneto-optical disk or a semiconductor memory is suitably loaded into the input/output interface 25. Thus, a computer program read out from the removable medium 31 is installed into the storage section 28 as occasion demands.

[0037]

It is to be noted that, though not shown, also hardware of the client 12 is configured similarly as

shown in FIG. 2.

[0038]

[Example of Functional Configuration of Server]

Now, an example of a functional configuration of the server 11 is described with reference to FIG. 3.

[0039]

The server 11 is configured from a PDI-Q generator 41, a transmission section 42, a PDI-A generator 43, a metadata distributor 44, a content accumulation section 45 and a content distributor 46.

[0040]

The PDI-Q generator 41 generates a PDI-Q (Preference Demographic and Interest-Question) which is information representing a question about the tastes of the user (viewer) of the client 12. Further, the PDI-Q generator 41 transmits the generated PDI-Q to the client 12 through the transmission section 42 and supplies the generated PDI-Q to the PDI-A generator 43.

[0041]

The transmission section 42 transmits various data supplied thereto from the PDI-Q generator 41, metadata distributor 44 and content distributor 46 to the client 12.

[0042]

The PDI-A generator 43 generates, based on the PDI-Q from the PDI-Q generator 41, a PDI-A (Preference Demographic and Interest-Answer) which is information representing an answer set on the provider side to the question about the tastes of the user of the client 12 described above and corresponds to the PDI-Q. The PDI-A generator 43 supplies the generated PDI-A to the metadata distributor 44.

[0043]

The metadata distributor 44 specifies (inquires about) content corresponding to the answer set on the provider side from within content accumulated in the content accumulation section 45 based on the PDI-A from the PDI-A generator 43. The metadata distributor 44 generates content metadata including the PDI-A as content metadata of the specified content and transmits the generated metadata to the client 12 through the transmission section 42.

[0044]

The content accumulation section 45 accumulates various kinds of content to be distributed to the client 12 therein.

[0045]

The content distributor 46 acquires content

specified by the metadata distributor 44 from within the content accumulated in the content accumulation section 45 and transmits the acquired content to the client 12 through the transmission section 42.

[0046]

[Example of Functional Configuration of Client]

Now, an example of a functional configuration of the client 12 is described with reference to FIG. 4.

[0047]

The client 12 is configured from a reception section 51, a PDI-A generator 52, a PDI-A storage section 53, a content filter 54, a content reproduction section 55 and a content accumulation section 56.

[0048]

The reception section 51 receives various data transmitted thereto from the server 11 and supplies the received data to the PDI-A generator 52 or the content filter 54.

[0049]

The PDI-A generator 52 generates, based on the PDI-Q transmitted thereto from the server 11, a PDI-A which represents an answer of the user to the question about the tastes of the user of the client 12 and corresponds to the PDI-Q, and supplies the generated PDI-A to the

PDI-A storage section 53.

[0050]

The PDI-A storage section 53 stores the PDI-A from the PDI-A generator 52. The PDI-A stored in the PDI-A storage section 53 is suitably read out into the content filter 54.

[0051]

The content filter 54 reads out the PDI-A from the PDI-A storage section 53 and carries out filtering of content based on the read out PDI-A and the PDI-A included in the content metadata of the content transmitted from the server 11. The content filter 54 supplies the filtered content to the content reproduction section 55 or the content accumulation section 56 in response to a result of the filtering.

[0052]

The content reproduction section 55 reproduces content from the content filter 54. Further, the content reproduction section 55 acquires content from the content accumulation section 56 and reproduces the acquired content.

[0053]

The content accumulation section 56 accumulates (records) the content from the content filter 54.

[0054]

[Example of Transmission and Reception Process of Content]

Now, a transmission and reception process of content in the broadcasting system 10 is described with reference to a flow chart of FIG. 5. In the transmission and reception process in the broadcasting system 10, a content distribution process is executed by the server 11 to distribute content, and a content acquisition process is executed by the client 12 to acquire the content.

[0055]

On the provider side such as a broadcasting organization, when, for example, a sponsor of content to be broadcast (distributed) or the broadcasting organization itself requests distribution of content to a viewer having a particular taste or attribute, the PDI-Q generator 41 of the server 11 generates, at step S11, in response to an operation of the staff on the provider side, a PDI-Q for inquiring of a viewer, that is, of a user of the client 12, about what taste or attribute the user has.

[0056]

[Example of Syntax of XML Schema]

Here, an example of syntax of an XML (Extensible

Markup Language) schema for configuring a PDI-Q and a PDI-A is described with reference to FIG. 6.

[0057]

Referring to FIG. 6, the first row indicates a declaration or definition for the identification of the PDI-Q, and the second row indicates a declaration of a title and a type of all questions defined as the PDI-Q.

[0058]

The 3rd to 12th rows indicate a declaration of a title and a type of each of the questions declared in the second row. In particular, the type "IntegerAnswerType" of the question defined by the name of "QIA" in the fifth row indicates that the question requests an answer of the integer type, and the type "BooleanAnswerType" of the question defined by the name of "QBA" in the sixth row indicates that the question requests an answer of the Boolean type. Further, the type "SelectionAnswerType" of the question defined by the name of "QSA" in the seventh row indicates that the question requests an answer of the answer selection type, and the type "TextAnswerType" of the question defined by the name of "QTA" in the eighth row indicates that the question requests an answer of the character string type. Further, the type "AnyAnswerType" of the question defined by the name of "QAA" in the ninth

row indicates that the question does not restrict the type of the answer.

[0059]

The 13th to 44th lines indicate a declaration of elements of the questions defined by the names of "QIA," "QBA," "QSA" and "QTA" from among the questions as declared in such a manner as described above. Particularly, the id elements indicated in the 15th, 24th, 31rd and 40th rows represent IDs (identifiers) for identifying the items of the questions and are defined as

"common:[category:]question-ID"

as a first format. In this first format, "common" represents that the question identified with the id element is defined commonly irrespective of a provider, and "category" represents a category of the question and "question-ID" represents an identifier of the question. It is to be noted that "category" may be represented in a hierarchical nest structure like

"common:[category1:category2:category3:...]question-ID"

as occasion demands.

[0060]

Further, the id element is defined as

"providerName:[category:]question-ID"

as a second format. In this second format, "providerName"

represents a name of a provider which sets the question identified by the id element. It is to be noted that "category" and "question-ID" are similar to those in the first format.

[0061]

A question defined as a PDI-Q in this manner is distinguished by the id element between a question which does not depend upon a provider which provides content (which is common to providers) and a question defined uniquely to a provider which provides content.

[0062]

In the following description, each of a question which does not depend upon a provider which provides content and an answer to the question is suitably referred to as provider-common filtering parameter. Meanwhile, each of a question defined uniquely to a provider which provides content and an answer to the question is suitably referred to as provider-unique filtering parameter.

[0063]

Since a provider-common filtering parameter is defined commonly to providers without depending upon individual providers as described above, it is usually provided by a vendor (maker or the like) of the client 12.

Accordingly, although it is possible for the PDI-Q generator 41 of the server 11 to be provided by the provider side, also it is possible for the PDI-Q generator 41 of the server 11 to be provided by a vendor of the client 12.

[0064]

It is to be noted that the syntax which configures a PDI-Q and a PDI-A is not limited to the example illustrated in FIG. 6.

[0065]

[Example of PDI-Q]

Now, an example of a PDI-Q configured based on the syntax of FIG. 6 is described with reference to FIG. 7.

[0066]

Referring to FIG. 7, the "transactional" in the first row indicates a value representative of whether or not, when questions (question group) defined by the PDI-Q are updated by the client 12 from which they have been transmitted, in the case where all of the substance of the items of the PDI-Q is not recorded/updated by some accident (interruption of processing by a disk writing error or an increase of the processing load or the like) during processing of recording/updating the substance of the items of the PDI-Q into a storage area not shown of

the client 12, the recording/updating process is to be nullified (so-called rollback) going back to the state immediately before the substance of the items of the PDI-Q was recorded/updated. When the "transactional" is "true," the PDI-Q is rolled back.

[0067]

The second to fifth rows define a question which asks for an answer of the Boolean type, and `<id>Common:111</id>` in the third row represents an id element of the question, and `<q>Are you currently employed?</q>` in the fourth row represents the question itself.

[0068]

The sixth to ninth rows define a question which asks for an answer of the integer type, and `<id>Common:222</id>` in the seventh row represents an id element of the question and `<q>What is the age of the oldest member of the household who watches television?</q>` in the eighth row represents the question itself. It is to be noted that the `minInclusive="10"` `maxInclusive="100"` in the sixth row represents that an answer to the question is restricted to an integral value equal to or higher than 10 but equal to or lower than 100.

[0069]

The 10th to 17th rows define a question which asks for an answer of the answer selection type, and `<id>ProviderA:123</id>` in the 11th row represents an id element of the question, and `<q>In which of the following sports are you most interested? (Multiple selection allowed)</q>` in the 12th row represents the question itself. `<a>Baseball` in the 13th row, `<a>Basketball` in the 14th row, `<a>Soccer` in the 15th row and `<a>Hockey` in the 16th row represents choices for an answer to the question. It is to be noted that the `minChoice="1"` `maxChoice="3"` in the tenth row represents that the number of answers to the question is restricted to one or more but three or less.

[0070]

The 18th to 24th rows define a question which asks for an answer of the answer selection type, and `<id>ProviderA:ProgramX:123</id>` in the 19th row represents an id element of the question. Further, `<q>Do you enjoy camping and outdoor recreation? (Only one selection)</q>` in the 20th row represents the question itself. `<a>Never` in the 21st row, `<a>Occasional` in the 22nd row and `<a>Frequently` in the 23rd row represent choices for an answer to the question. It is to be noted that the `maxChoice="1"` in the 18th row

represents that the number of answers to the question is restricted to one.

[0071]

In this manner, in the PDI-Q, proposed answers to the question and also a restriction condition to the answer are defined depending upon the type of the question.

[0072]

The 25th to 28th rows define a question which asks for an answer of the character string type, and `<id>ProviderA:321</id>` in the 26th row represents an id element of the question and `<q>Who's products are you most interested in recently?</q>` in the 27th row represents the question itself.

[0073]

In the following description, each of questions defined by the PDI-Q in FIG. 7 is referred to as question of the id element. In particular, the question defined by the second to fifth rows is referred to as question of "Common:111"; the question defined by the sixth to ninth rows is referred to as question of "Common:222"; the question defined by the 10th to 17th rows is referred to as question of "ProviderA:123"; the question defined by the 18th to 24th rows is referred to as question of

"ProviderA:ProgramX:123"; and the question defined by the 25th to 28th rows is referred to as question of "ProviderA:321."

[0074]

At this time, the question of "Common:111" and the question of "Common:222" are identified to provider-common filtering parameters, and the question of "ProviderA:123," the question of the "ProviderA:ProgramX:123" and the question of "ProviderA:321" are identified into provider-unique filtering parameters. For example, the question of "Common:111" indicates that the question is set commonly to the providers and has the identifier of "111." Meanwhile, the question of "ProviderA:ProgramX:123" indicates that the question is set by a provider of "ProviderA" and has the category (program ID) of "ProgramX" and the identifier of "123."

[0075]

Referring back to the flow chart of FIG. 5, at step S12, the PDI-Q generator 41 of the server 11 transmits the generated PDI-Q to the client 12 through the transmission section 42 and supplies the generated PDI-Q to the PDI-A generator 43.

[0076]

At step S21, the reception section 51 of the client 12 receives the PDI-Q transmitted thereto from the server 11 and supplies the received PDI-Q to the PDI-A generator 52.

[0077]

It is to be noted that the PDI-Q is received by the client 12, for example, every time it is broadcast (transmitted) at predetermined time intervals from a broadcasting station as a provider in which the server 11 is provided. Or, the PDI-Q may be received by the client 12 when the channel of the client 12 is adjusted to a channel of the broadcasting station in which the server 11 is provided.

[0078]

At step S22, the PDI-A generator 52 of the client 12 generates a PDI-A to a question defined in the PDI-Q received by the reception section 51. In particular, when the PDI-Q from the server 11 is received, then the PDI-A generator 52 causes a display section not shown to display a screen image corresponding to a question defined in the PDI-Q and causes a user (viewer) of the client 12 to input or select an answer to the question to generate a PDI-A representative of the answer. In other words, the PDI-A generator 52 interacts with the user to

generate a PDI-A representative of an answer to a question defined in the PDI-Q.

[0079]

[Example of Screen Display in Interaction with User by PDI-A Generator]

Here, examples of the screen display in an interaction with a user by the PDI-A generator 52 is described with reference to FIGS. 8 to 12. It is to be noted that it is assumed here that the client 12 receives the PDI-Q described hereinabove with reference to FIG. 7 and screen images corresponding to the question group defined in the received PDI-Q are successively displayed on the display section not shown of the client 12.

[0080]

FIG. 8 shows a screen display example corresponding to the question of "Common:111" from among the questions defined in the PDI-Q described hereinabove with reference to FIG. 7. In FIG. 8, the question "Are you currently employed?" indicated in the fourth row of FIG. 7 is displayed in a question presentation field 61. Further, a message "Please select one of choices" for urging the user to input an answer to the question and a selection button 62-1 for allowing the user to select "Yes" as an answer to the question and another selection button 62-2

for allowing the user to select "No" as an answer to the question are displayed.

[0081]

FIG. 9 shows a screen display example corresponding to the question of "Common:222" from among the questions defined in the PDI-Q described hereinabove with reference to FIG. 7. In FIG. 9, the question "What is the age of the oldest member of the household who watches television?" indicated in the eighth row of FIG. 7 is displayed in a question presentation field 71. Further, a message "Please input your age." for urging the user to input an answer to the question and an answer inputting field 72 for allowing the user to input an integer value as an answer to the question are displayed.

[0082]

FIG. 10 shows a screen display example corresponding to the question of "ProviderA:123" from among the questions defined in the PDI-Q described hereinabove with reference to FIG. 7. In FIG. 10, the question "In which of the following sports are you most interested? (Multiple selection allowed)" indicated in the 12th row of FIG. 7 is displayed in a question presentation field 81. Further, a message "Please select one or more but three or less of next choices." for

urging the user to input an answer to the question and selection buttons 82-1 to 82-4 for allowing the user to select choices "Baseball," "Basketball," "Soccer" and "Hockey" as an answer to the question are displayed.

[0083]

FIG. 11 shows a screen display example corresponding to the question of "ProviderA:ProgramX:123" from among the questions defined in the PDI-Q described hereinabove with reference to FIG. 7. In FIG. 11, the question "Do you enjoy camping and outdoor recreation? (Only one selection)" indicated in the 20th row of FIG. 7 is displayed in a question presentation field 91. Further, a message "Please select only one of next choices." for urging the user to input an answer to the question and selection buttons 92-1 to 92-3 for allowing the user to select choices "Never," "Occasionally" and "Frequently" as an answer to the question are displayed.

[0084]

FIG. 12 shows a screen display example corresponding to the question of "ProviderA:321" from among the questions defined in the PDI-Q described hereinabove with reference to FIG. 7. In FIG. 12, the question "Who's products are you most interested in recently?" indicated in the 27th row of FIG. 7 is

displayed in a question presentation field 101. Further, a message "Please describe freely." for urging the user to input an answer to the question and an answer inputting field 102 for allowing the user to input a character string as an answer to the question are displayed.

[0085]

The PDI-A generator 52 allows the user to input or select an answer to the questions defined in the PDI-Q through the screen displays described above with reference to FIGS. 8 to 12 in this manner to generate a PDI-A corresponding to the PDI-Q.

[0086]

It is to be noted that the screen displays described above with reference to FIGS. 8 to 12 may be displayed shortly after the PDI-Q is received or, after reception of the PDI-Q, the PDI-Q may be retained into the storage section not shown such that they are displayed when an instruction to display a setting screen is issued by the user or in a like case.

[0087]

[Example of PDI-A]

Here, an example of a PDI-A generated by the PDI-A generator 52 is described with reference to FIG. 13. The

PDI-A shown in FIG. 13 is generated based on selection or inputting of an answer by a user on the screen displays shown in FIGS. 8 and 12.

[0088]

In particular, the second to fifth rows indicate an answer of a user to the question presented by the screen display described hereinabove with reference to FIG. 8. In particular, `<id>Common:111</id>` indicates an id element of the question presented by the screen display of FIG. 8, and `<a>true` in the fourth row indicates that, as an answer to the question, the selection button 62-1 (answer of "Yes") is selected on the screen display of FIG. 8 by the user.

[0089]

The sixth to ninth rows indicate an answer of the user to the question presented by the screen display described hereinabove with reference to FIG. 9. In particular, `<id>Common:222</id>` in the seventh row indicates an id element of the question presented by the screen display of FIG. 9, and `<a>34` in the eighth row indicates that, as an answer to the question, "34" is inputted as an integer value to the answer inputting field 72 on the screen display of FIG. 9 by the user.

[0090]

The 10th to 15th rows indicate an answer of the user to the question presented by the screen display described hereinabove with reference to FIG. 10. In particular, `<id>ProviderA:123</id>` in the 11th row indicates an id element of the question presented by the screen display of FIG. 10, and `<a>Baseball` in the 12th row, `<a>Soccer` in the 13th row and `<a>Hockey` in the 14th row indicate that, as an answer to the question, the selection buttons 82-1, 82-3 and 82-4 are selected on the display screen of FIG. 10 by the user.

[0091]

The 16th to 19th rows indicate an answer of the user to the question presented by the screen display described hereinabove with reference to FIG. 11. In particular, `<id>ProviderA:ProgramX:123</id>` in the 17th row indicates an id element of the question presented by the screen display of FIG. 11, and `<a>Occasionally` in the 18th row indicates that, as an answer to the question, the selection button 92-2 is selected on the screen display of FIG. 11 by the user.

[0092]

The 20th to 23rd rows indicate an answer of the user to the question presented by the screen display described hereinabove with reference to FIG. 12. In

particular, <id>ProviderA:321</id> in the 21st row indicates an id element of the question presented by the screen display of FIG. 12, and <a>Somy in the 22nd row indicates that, as an answer to the question, "Somy" is inputted as a character string to the answer inputting field 102 on the screen display of FIG. 12 by the user.

[0093]

The PDI-A generator 52 supplies the PDI-A generated in this manner to the PDI-A storage section 53 so as to be stored. The PDI-A stored in the PDI-A storage section 53 is used when it is decided whether or not content distributed from the server 11 matches the tastes of the user of the client 12 as hereinafter described.

[0094]

Referring back to the flow chart of FIG. 5, at step S13, the PDI-A generator 43 of the server 11 generates a PDI-A to the question defined in the PDI-Q from the PDI-Q generator 41 and supplies the PDI-Q to the metadata distributor 44. In particular, when a PDI-Q is generated by an operation of the staff of the broadcasting station (provider side), the PDI-A generator 43 causes the display section not shown to display, for example, such a screen image corresponding to the question defined in the PDI-Q as described hereinabove with reference to FIGS. 8

to 12 and then causes the staff of the broadcasting station to input or select an answer to the question to generate a PDI-A representative of the answer. At this time, the staff of the broadcasting station would input or select an answer corresponding to content to be distributed as an answer to the question defined in the PDI-Q. In other words, the PDI-A generated by the PDI-A generator 43 represents information (answer) for causing the provider side to allow the viewer to view the content to be distributed later taking the tastes of the user (viewer) of the client 12 into consideration.

[0095]

At step S14, the metadata distributor 44 specifies (inquires about), based on the PDI-A from the PDI-A generator 43, content corresponding to the PDI-A from among content accumulated in the content accumulation section 45. The content specified here may be that content with regard to which the content metadata has a higher degree of similarity to the PDI-A from the PDI-A generator 43 than a predetermined value from within the accumulated content to which the content metadata are applied in advance or may be that content selected in advance as content to be viewed by the user by the staff of the broadcasting station. It is to be noted that the

content specified by the metadata distributor 44 is acquired from the content accumulation section 45 by the content distributor 46.

[0096]

At step S15, the metadata distributor 44 newly generates content metadata which includes the PDI-A based on the content metadata applied in advance to the content specified at step S15 and the PDI-A from the PDI-A generator 43.

[0097]

At step S16, the transmission section 42 distributes the content acquired by the content distributor 46 together with the content metadata generated by the metadata distributor 44. At this time, as the content metadata, content metadata prescribed by a standardization organization may be transmitted in addition to the content metadata generated by the metadata distributor 44.

[0098]

In this manner, as an answer to the question defined in the PDI-Q, content whose content metadata includes a PDI-A representative of an answer intended by the provider side, in other words, content which matches the tastes of the user and of which the provider side

expects viewing by the user is distributed.

[0099]

It is to be noted that the processes at steps S13 to S16 need not be executed immediately after the process at step S12 but may be executed before the client 12 owned by each user generates and stores a PDI-A.

[0100]

Further, while it is described that, at step S16, the content is distributed together with the content metadata, the content may not be distributed together with the content metadata, but after the content metadata including the PDI-A is transmitted in advance, the content corresponding to the content metadata may be transmitted.

[0101]

When the content and the content metadata are distributed from the server 11 in this manner, at step S23, the reception section 51 of the client 12 receives the content and the content metadata distributed thereto from the server 11 and supplies them to the content filter 54.

[0102]

At step S24, the content filter 54 carries out matching between the PDI-A stored in the PDI-A storage

section 53 and the PDI-A included in the content metadata from the server 11. It is to be noted that, in the following description, in order to distinguish the PDI-A stored in the PDI-A storage section 53 and the PDI-A included in the content metadata from the server 11 from each other, the former is referred to as user side PDI-A and the latter is referred to as provider side PDI-A.

[0103]

[Example of Matching Process by Content Filter]

Here, it is assumed that, as the user side PDI-A, the PDI-A described hereinabove with reference to FIG. 13 is generated and stored and, as the provider side PDI-A, the PDI-A illustrated in FIG. 14 has been transmitted from the server 11.

[0104]

The provider side PDI-A illustrated in FIG. 14 has a basic configuration same as that of the user side PDI-A illustrated in FIG. 13. Although detailed description of the same is omitted herein, the provider side PDI-A indicates that "false" is selected as an answer to the question of "Common:111"; "Baseball" is selected as an answer to the question of "ProviderA:123"; and "Never" is selected as an answer to the question of the "ProviderA:ProgramX:123."

[0105]

At this time, the content filter 54 compares the user side PDI-A and the provider side PDI-A with each other, and if at least one of the answers to the questions indicates coincidence, then it is decided that the user side PDI-A and the provider side PDI-A match each other. However, if none of the answers to the questions indicates coincidence, then it is decided that the user side PDI-A and the provider side PDI-A do not match each other. In this instance, since the answer to the question of "ProviderA:123" in the user side PDI-A illustrated in FIG. 13 and the answer to the question of "providerA:123" in the provider side PDI-A illustrated in FIG. 14 coincide with each other in that both of them include "Baseball," it is decided that the user side PDI-A and the provider side PDI-A match each other.

[0106]

Then, it is assumed that a PDI-A illustrated in FIG. 15 is transmitted as the provider side PDI-A from the server 11.

[0107]

The provider side PDI-A illustrated in FIG. 15 indicates that "Basketball" is selected as an answer to the question of "ProviderA:123" and "Never" is selected

as an answer to the question of "ProviderA:ProgramX:123."

[0108]

In this instance, since none of the answers to the questions in the user side PDI-A illustrated in FIG. 13 and the answers to the questions in the provider side PDI-A illustrated in FIG. 15 coincide with each other, it is decided that the user side PDI-A and the provider side PDI-A do not match each other.

[0109]

The content filter 54 carries out a matching process between the user side PDI-A and the provider side PDI-A in this manner.

[0110]

At step S25, the content filter 54 decides whether or not the user side PDI-A and the provider side PDI-A match each other. If it is decided at step S25 that the user side PDI-A and the provider side PDI-A match each other, then the content filter 54 decides that the content distributed from the server 11 matches the tastes of the user (viewer) of the client 12 and supplies the content to the content reproduction section 55 or the content accumulation section 56. Then, the processing advances to step S26.

[0111]

If the content distributed from the server 11 is supplied from the content filter 54 to the content reproduction section 55, then the content reproduction section 55 reproduces the content at step S26. Further, if the content distributed from the server 11 is supplied from the content filter 54 to the content accumulation section 56, then the content accumulation section 56 accumulates (records) the content at step S26. The accumulated content is suitably supplied to and reproduced by the content reproduction section 55 in response to an operation instruction of the user.

[0112]

On the other hand, if it is decided at step S25 that the user side PDI-A and the provider side PDI-A do not match each other, then the content filter 54 decides that the content distributed from the server 11 does not match the tastes of the user (viewer) of the client 12, and discards (deletes) the content, thereby ending the processing.

[0113]

According to the process described above, in a broadcasting system, on the provider side, a PDI-Q representative of a question regarding the tastes of a user is generated by a server, and the PDI-Q is

transmitted to a client terminal. In response to the PDI-Q, a provider side PDI-A representative of an answer set by the provider side is distributed as content metadata of corresponding content. Consequently, as the content metadata, content metadata which meets the needs at the time other than content metadata prescribed by a standardization organization can be applied to content. On the other hand, on the user side, a user side PDI-A representative of an answer of the user to the PDI-Q from the server is generated by the client apparatus, and matching between the generated user side PDI-A and the provider side PDI-A from the server is carried out to determine whether or not the content distributed from the server is to be acquired. Consequently, content can be filtered with content metadata which meets the needs at the time other than content metadata prescribed by a standardization organization. Accordingly, content which meets the needs at the time can be acquired.

[0114]

It is to be noted that, in the foregoing description, the client 12 carries out matching of PDI-As on the real time basis upon distribution of content from the server 11. However, all content may be accumulated upon distribution of content from the server 11 such that

matching of PDI-As is carried out on the background of processing and content corresponding to a PDI-A (provider side PDI-A) which exhibits matching from within the accumulated content is reproduced or content which corresponds to a PDI-A which does not exhibit matching is deleted.

[0115]

Further, in the foregoing description, the content filter 54 compares the user side PDI-A and the provider side PDI-A represented as instances with each other and carries out matching between the user side PDI-A and the provider side PDI-A depending upon whether or not at least one of the answers to the questions exhibits matching. However, one of the user side PDI-A and the provider side PDI-A is represented as a query which evaluates the PDI-A to compare the user side PDI-A and the provider side PDI-A.

[0116]

In the following, a configuration wherein one of the user side PDI-A and the provider side PDI-A is represented as a query to compare the user side PDI-A and the provider side PDI-A with each other is described.

[0117]

[Example 1 of Matching Process by Query Wherein PDI-A Is

Evaluated]

First, a configuration wherein the provider side PDI-A is represented as a query to compare the user side PDI-A and the provider side PDI-A with each other is described.

[0118]

FIG. 16 shows an example of a functional configuration of the server 11 wherein the provider side PDI-A is represented as a query.

[0119]

The server 11 of FIG. 16 is configured from a PDI-Q generator 41, a transmission section 42, a content accumulation section 45, a content distributor 46, a PDI-A query generator 111 and a metadata distributor 112.

[0120]

It is to be noted that components of the server 11 of FIG. 16 which have functions similar to those provided in the server 11 of FIG. 3 are denoted by like names and like reference characters, and description of them is suitably omitted herein.

[0121]

In particular, the server 11 of FIG. 16 is different from the server 11 of FIG. 3 in that it includes the PDI-A query generator 111 and the metadata

distributor 112 in place of the PDI-A generator 43 and the metadata distributor 44.

[0122]

The PDI-A query generator 111 generates, based on a PDI-Q from the PDI-Q generator 41, a PDI-A (provider side PDI-A) corresponding to the PDI-Q, generates a PDI-A query in which the generated provider side PDI-A is applied to a predetermined conditional statement, and supplies the PDI-A query to the metadata distributor 112.

[0123]

The metadata distributor 112 specifies (inquires about) content corresponding to the PDI-A query from within the content accumulated in the content accumulation section 45 based on the PDI-A query from the PDI-A query generator 111. The metadata distributor 112 generates, as content metadata of the specified content, content metadata which includes the PDI-A query, and transmits the generated content metadata to the client 12 through the transmission section 42.

[0124]

Further, the client 12 in this example is same as the client 12 of FIG. 4 except that the content filter 54 of FIG. 4 reads out a PDI-A (user side PDI-A) from the PDI-A storage section 53 and filters content based on the

read out user side PDI-A and a PDI-A query included in content metadata transmitted thereto from the server 11. Therefore, description of the client 12 in the present example is omitted herein.

[0125]

Now, a content transmission and reception process of the broadcasting system 10 which includes the server 11 of FIG. 16 is described with reference to a flow chart of FIG. 17.

[0126]

It is to be noted that processes at steps S31, S32, S36, S41 to S43, S45 and S46 of the flow chart of FIG. 17 are basically similar to the processes at steps S11, S12, S16, S21 to S23, S25 and S26 of the flow chart of FIG. 5, respectively, and therefore, description of them is omitted herein.

[0127]

In particular, at step S33, the PDI-A query generator 111 of the server 11 generates a provider side PDI-A to a question defined in a PDI-Q from the PDI-Q generator 41, generates a PDI-A query in which the generated provider side PDI-A is applied to a predetermined conditional expression, and supplies the PDI-A query to the metadata distributor 112. More

particularly, for example, if a PDI-Q is generated by operation of the staff of the broadcasting station (provider side), then the PDI-A query generator 111 causes the display section not shown to display, for example, such a screen image corresponding to a question defined in the PDI-Q as described hereinabove with reference to any of FIGS. 8 to 12. Then, the PDI-A query generator 111 causes the staff of the broadcasting station to input or select an answer to the question. Further, the PDI-A query generator 111 causes the staff to determine a combination (filtering condition) of such answers to generate a PDI-A query representative of the combination of the answers. At this time, the staff of the broadcasting station would input or select an answer corresponding to content to be distributed and then determine a combination of such answers as an answer to the questions defined in the PDI-Q. In particular, the PDI-A query generated by the PDI-A query generator 111 represents information (combination of answers) for allowing a user (viewer) of the client 12 to view content to be distributed later taking the tastes of the viewer into consideration on the provider side.

[0128]

At step S34, the metadata distributor 112 specifies

(inquires about), based on the PDI-A query from the PDI-A query generator 111, content corresponding to the PDI-A query from within the content accumulated in the content accumulation section 45. The content specified here may be that content with regard to which the content metadata has a higher degree of similarity to the PDI-A query from the PDI-A query generator 111 than a predetermined value from within the accumulated content to which the content metadata are applied in advance or may be that content selected in advance as content to be viewed by the user by the staff of the broadcasting station. It is to be noted that the content specified by the metadata distributor 112 is acquired from the content accumulation section 45 by the content distributor 46.

[0129]

At step S35, the metadata distributor 112 newly generates, based on content metadata applied in advance to the content specified at step S34 and the PDI-A query from the PDI-A query generator 111, content metadata including the PDI-A query.

[0130]

Then at step S44, the content filter 54 of the client 12 carries out, based on the PDI-A included in the content metadata from the server 11, matching of the PDI-

A stored in the PDI-A storage section 53.

[0131]

Here, it is assumed that the PDI-A described hereinabove with reference to FIG. 13 has been generated and stored as the user side PDI-A and a PDI-A query given below has been transmitted from the server 11.

```
"/QBA[id='Common:111' and a='true'] and  
//QSA[id='ProviderA:123' and a='Baseball']"
```

[0132]

The PDI-A query given above indicates that the user side PDI-A evaluates whether or not "true" is selected as an answer to the question of "Common:111" and "Baseball" is selected as an answer to the question of "ProviderA:123."

[0133]

At this time, the content filter 54 evaluates the user side PDI-A based on the PDI-A query, and if the user side PDI-A satisfies (is true to) the PDI-A query, then the content filter 54 decides that the user side PDI-A and the PDI-A query match each other. However, if the user side PDI-A does not satisfy (is false to) the PDI-A query, the content filter 54 decides that the user side PDI-A and the PDI-A query do not match each other. In this instance, in the user side PDI-A illustrated in FIG.

13, since "true" is selected as an answer to the question of "Common:111" and "Baseball" is selected as an answer to the question of "providerA:123," the user side PDI-A and the PDI-A query are decided to match each other.

[0134]

Since a more complicated filtering condition is represented by a PDI-A query set by the provider side in this manner, it is possible to allow a user (viewer) to acquire content expected by the provider side with a higher degree of certainty.

[0135]

[Example 2 of Matching Process by Query Wherein PDI-A Is Evaluated]

Now, a configuration wherein a user side PDI-A is represented as a query and the user side PDI-A and a provider side PDI-A are compared with each other is described.

[0136]

FIG. 18 shows an example of a functional configuration of the client 12 wherein a user side PDI-A is represented as a query.

[0137]

The client 12 of FIG. 18 is configured from a reception section 51, a content filter 54, a content

reproduction section 55, a content accumulation section 56, a PDI-A query generator 131 and a PDI-A query storage section 132.

[0138]

It is to be noted that, in the client 12 of FIG. 18, components having functions similar to those provided in the client 12 of FIG. 4 are denoted by like names and like reference characters, and description of them is suitably omitted herein.

[0139]

In particular, the client 12 of FIG. 18 is different from the client 12 of FIG. 4 in that it includes the PDI-A query generator 131 and the PDI-A query storage section 132 in place of the PDI-A generator 52 and the PDI-A storage section 53.

[0140]

The PDI-A query generator 131 generates, based on a PDI-Q transmitted thereto from the server 11, a PDI-A (user side PDI-A) which corresponds to the PDI-Q and represents an answer of a user of the client 12 to a question about the tastes of the user. Then, the PDI-A query generator 131 generates a PDI-A query in which the generated user side PDI-A is applied to a predetermined conditional expression and supplies the generated PDI-A

query to the PDI-A query storage section 132.

[0141]

The PDI-A query storage section 132 stores the PDI-A query from the PDI-A query generator 131. The PDI-A query stored in the PDI-A query storage section 132 is read out to the content filter 54.

[0142]

It is to be noted that the content filter 54 of FIG. 18 reads out the PDI-A query from the PDI-A storage section 53 and filters content based on the PDI-A query and a provider side PDI-A included in content metadata transmitted from the server 11.

[0143]

Further, the server 11 in the present example is same as the server 11 of FIG. 3, and therefore, description of the same is omitted herein.

[0144]

Now, a content transmission and reception process in the broadcasting system 10 which includes the client 12 of FIG. 18 is described with reference to a flow chart of FIG. 19.

[0145]

It is to be noted that processes at steps S51 to S61, S63, S65 and S66 of the flow chart of FIG. 19 are

basically similar to the processes at steps S11 to S21, S23, S25 and S26 of the flow chart of FIG. 5, and therefore, description of them is omitted herein.

[0146]

In particular, at step S62, the PDI-A query generator 131 of the client 12 generates a user side PDI-A to a question defined in a PDI-Q received by the reception section 51 and then generates a PDI-A query in which the generated user side PDI-A is applied to a predetermined conditional expression. In particular, when a PDI-Q is received from a broadcasting station, for example, the PDI-A query generator 131 causes the display section not shown to display such a screen image corresponding to a question defined in the PDI-Q as described hereinabove with reference to any of FIGS. 8 to 12. Then, the PDI-A query generator 131 causes the user (viewer) of the client 12 to input or select an answer to the question and causes the user to determine a combination of such answers (filtering condition) to generate a PDI-A query representative of the combination of the answers. In other words, the PDI-A query generator 131 interacts with the user to generate a PDI-A query representative of a combination of answers to the questions defined in the PDI-Q.

[0147]

Then at step S64, the content filter 54 carries out, based on the PDI-A query stored in the PDI-A query storage section 132, matching of the provider side PDI-A included in content metadata from the server 11.

[0148]

Here, it is assumed that, as the provider side PDI-A, the PDI-A described hereinabove with reference to FIG. 14 has been transmitted from the server 11, and a PDI-A query given below has been generated and stored.

```
“//QBA[id='Common:111' and a='false'] and  
//QSA[id='ProviderA:123' and a='Baseball']”
```

[0149]

The PDI-A query described above indicates that the provider side PDI-A evaluates whether or not “false” is selected as an answer to the question of “Common:111” and besides “Baseball” is selected as an answer to the question of “ProviderA:123.”

[0150]

At this time, the content filter 54 evaluates the provider side PDI-A based on the PDI-A query, and if the provider side PDI-A satisfies (is true to) the PDI-A query, then the content filter 54 decides that the provider side PDI-A and the PDI-A query match each other.

However, if the provider side PDI-A does not satisfy (is false to) the PDI-A query, then the content filter 54 decides that the provider side PDI-A and the PDI-A query do not match each other. In this instance, in the provider side PDI-A illustrated in FIG. 14, since "false" is selected as an answer to the question of "Common:111" and "Baseball" is selected as an answer to the question of "providerA:123," the user side PDI-A and the PDI-A query are decided to match each other.

[0151]

Since a more complicated filtering condition is represented by a PDI-A query set by the user side in this manner, it is possible to allow a user to acquire content expected by the user side with a higher degree of certainty.

[0152]

Incidentally, while the present invention can be applied to a broadcasting system which broadcasts a digital television program, as an example, the present invention can be applied to a broadcasting system which broadcasts in accordance with the ATSC-M/H (Mobile/Handheld) system which is an expanded form of the ATSC (Advanced Television Standard Committee) system to mobile reception.

[0153]

[Example of Adaptation to Broadcasting System Which Broadcasts in Accordance with ATSC-M/H System]

FIG. 20 is a view showing an example of a configuration of a broadcasting system which broadcasts a digital television program in accordance with the conventional ATSC system and the ATSC-M/H system and to which the present invention is applied.

[0154]

The broadcasting system of FIG. 20 corresponds to the server 11 in the broadcasting system 10 of FIG. 1 and includes an ATSC Legacy System 151, an ATSC M/H System 152, an M/H Framing 153 and an RF/Transmission System 154.

[0155]

The ATSC Legacy System 151 signals a broadcasting stream in the form of an MPEG2-TS (Moving Picture Experts Group 2 Transport Stream) in accordance with the conventional ATSC system. The ATSC M/H System 152 signals a broadcasting stream of IP packets in accordance with the ATSC-M/H system. Control Data 152a of the ATSC M/H System 152 are control information relating to a broadcasting stream (A/V (Audio/Video) content) signaled from the ATSC M/H System 152.

[0156]

Such broadcasting streams as described above are multiplexed by the W/H Framing 153 and transmitted as a broadcasting wave by the RF/Transmission System 154. It is to be noted that, since details of the functions of the blocks are described in the specification of the ATSC, description of the same is omitted herein.

[0157]

FIG. 21 illustrates a protocol stack in a signal of a broadcasting wave transmitted in accordance with the ATSC-M/H system.

[0158]

Although detailed description is omitted herein, one of uppermost layers is set as "Service Guide" and prescribes metadata of content provided in accordance with the ATSC-M/H system. The Control Data 152a shown in FIG. 20 are transmitted as content metadata defined by the "Service Guide" (such metadata is hereinafter referred to merely as Service Guide). In particular, in the broadcasting system of FIG. 20, a PDI-A (provider side PDI-A), a PDI-A query and a PDI-Q transmitted from the server 11 to the client 12 in the broadcasting system 10 described hereinabove are placed into and transmitted together with the Service Guide.

[0159]

It is to be noted that, in FIG. 21, a lower layer "FLUTE" adjacent the "Service Guide" and a lower layer "ALC" adjacent the "FLUTE" are layers for transferring the Service Guide packetized in accordance with the UDP/IP (User Datagram Protocol/Internet Protocol).

[0160]

As the specification for this Service Guide, a data configuration illustrated in FIG. 22 is defined by the OMA (Open Mobile Alliance). It is to be noted that, since details of the configuration of the Service Guide illustrated in FIG. 22 are prescribed in "'Service Guide for Mobile Broadcast Services,' Open Mobile Alliance, OMA-TSBCAST_ServiceGuide-V1_0, Candidate Version 1.0," description of them is omitted herein.

[0161]

A PDI-A (provider side PDI-A) or a PDI-A query is placed in at least one of a "Service" fragment, "Schedule" fragment and a "Content" fragment from among elements which configure the Service Guide illustrated in FIG. 22.

[0162]

The "Service" fragment is metadata including control information relating to the substance of a channel service, and FIG. 23 illustrates details of a

configuration of the same. A PDI-A or a PDI-A query is placed into the "Service" fragment illustrated in FIG. 23 by newly adding a "PDI-A" element to a "PrivateExt" element defined at the lowermost stage. In particular, for example, a "PDI-A" element is represented and encoded in a character string of `<xs:element name = "PDI-A" type = "xs:string" xmlns:xs = "http://www.w3.org/2001/XMLSchema"/>` by an XML schema. [0163]

The "Schedule" fragment is metadata including control information relating to a distribution schedule of content (digital television program), and FIG. 24 illustrates details of a configuration of the same. A PDI-A or a PDI-A query is placed into the "Schedule" fragment illustrated in FIG. 24 by newly adding a "PDI-A" element to the "PrivateExt" element defined at the lowermost stage. In particular, for example, a "PDI-A" element is represented and encoded in a character string as `<xs:element name = "PDI-A" type = "xs:string" xmlns:xs = "http://www.w3.org/2001/XMLSchema"/>` by an XML schema. [0164]

The "Content" fragment is metadata including control information relating to the substance of content (digital television program), and FIG. 25 illustrates

details of a configuration of the "Content" fragment. A PDI-A or a PDI-A query is placed into the "Content" fragment illustrated in FIG. 25 by newly adding a "PDI-A" element to the "PrivateExt" element defined at the lowermost stage. In particular, for example, the "PDI-A" element is represented in a character string of

```
<xs:element name = "PDI-A" type = "xs:string" xmlns:xs = "http://www.w3.org/2001/XMLSchema"/>
```

by an XML schema.

[0165]

Further, the PDI-Q is placed into the "Interactivity Data" fragment from among elements which configure the Service Guide illustrated in FIG. 22.

[0166]

The "Interactivity Data" fragment is metadata regarding an application relating to a channel service or content (television program), and FIG. 26 illustrates details of a configuration of the same. The PDI-Q is placed into the "Interactivity Data" fragment illustrated in FIG. 26 by newly adding a "PDI-Q" element to the "PrivateExt" element defined at the lowermost stage. In particular, for example, the "PDI-Q" element is represented and encoded in a character string of

```
<xs:element name = "PDI-Q" type = "xs:string" xmlns:xs = "http://www.w3.org/2001/XMLSchema"/>
```

by an XML schema.

[0167]

While, in the foregoing, an example wherein the present invention is applied to a broadcasting system which broadcasts in the ATSC-M/H system is described, also it is possible to apply the present invention to a broadcasting system which carries out NRT (Non-RealTime) broadcasting in accordance with the conventional ATSC system. Since the NRT broadcasting does not presuppose viewing of content on the real time basis, there is no necessity to reproduce content in synchronism with broadcasting time of content which is broadcast through a broadcasting signal as data.

[0168]

[Example of Application to Broadcasting System Which Carries Out NRT Broadcasting]

FIG. 27 illustrates a protocol stack in a signal of a broadcasting wave transmitted by NRT broadcasting.

Although detailed description is omitted, the lowermost hierarchical layer is "physical Layer," and a frequency band of the broadcasting wave corresponds to this. An upper layer adjacent the "Physical Layer" is "MPEG2-TS," and a broadcasting stream broadcast as a broadcasting wave corresponds to this.

[0169]

As an upper layer adjacent the "MPEG2-TS," "ATSC-PSIP (Program and System Information Protocol)" and "MPEG2-PSI (Program Specific Information)" are indicated. The "ATSC-PSIP" is a hierarchy which has a TVCT, and the "MPEG2-PSI" is a hierarchy having a PAT (Program Association Table) and a PMT (Program Map Table).

[0170]

Further, as an upper layer adjacent the "MPEG2-TS," "DSM-CC (Digital Storage Media Command and Control) Addressable Section" is indicated. The "DSM-CC Addressable Section" is used as an adaptation layer for transferring an IP packet on the MPEG2-TS of a broadcasting stream.

[0171]

FIG. 28 illustrates a data structure of the TVCT, PAT, PMT and DSM-CC Addressable Section. In the TVCT, control information relating to a broadcasting stream broadcast by the MPEG2-TS is described, and an MPEG2-TS for transferring the DSM-CC Addressable Section for transferring an IP packet stream (UDP/IP Packets) is specified based on the TVCT.

[0172]

Referring back to FIG. 27, as an upper hierarchy adjacent the "DSM-CC Addressable Section," "IP" is

indicated, and a further upper hierarchy adjacent the "IP," "UDP" is indicated.

[0173]

As an upper layer adjacent the "UDP," "Service Signaling Channel" and "FLUTE/ALC (File Delivery over Unidirectional Transport/Asynchronous Layered Coding Protocol)" are indicated. The "Service Signaling Channel" is a layer having an SMT (Service Map Table) and an NRT-IT (NRT Information Table). As an upper layer adjacent the "FLUTE/ALC," "FLUTE Session" is indicated. The "FLUTE Session" is a layer having a FLUTE-FDT (File Delivery Table and an A/V File.

[0174]

FIG. 29 illustrates a data structure of the SMT, NRT-IT and FLUTE FDT. In the SMT, metadata relating to a channel is described, and in the NRT-IT, metadata relating to content is described. The SMT and the NRT-IT are transferred by the "Service Signaling Channel" described hereinabove. In the FLUTE FDT, information for identifying A/V files is described. It is to be noted that an A/V file is transferred by the "FLUTE/ALC" described hereinabove.

[0175]

Here, in a broadcasting system which carries out

NRT broadcasting, a PDI-A (provider side PDI-A), a PDI-A query or a PDI-Q to be transmitted from the server 11 to the client 12 in the broadcasting system 10 described hereinabove is placed in or transmitted together with the SMT or NRT-IT.

[0176]

In particular, in the case where filtering of content to be distributed is carried out in a unit of a channel (broadcasting station), "PDI descriptor" for placing a PDI-A, a PDI-A query or a PDI-Q is defined newly in a descriptor loop (in the figure, the lowermost stage of "Service #1") of a service level of the SMT.

[0177]

On the other hand, in the case where filtering of content to be distributed is carried out in a unit of a content, "PDI descriptor" for placing a PDI-A, a PDI-A query or a PDI-Q is defined newly in a descriptor loop (in the figure, the lowermost stage of "Content #1") of the service level of the NRT-IT.

[0178]

FIG. 30 illustrates an example of syntax of the "PDI descriptor." In FIG. 30, each of descriptors to be described is defined together with a bit number (No. of Bits) and a format (Format).

[0179]

According to the syntax illustrated in FIG. 30, a PDI-A, a PDI-A query or a PDI-Q is described in a descriptor "PDI_Q or PDI_A or PDI_A_Query" of variable bits.

[0180]

It is to be noted that the syntax of the "PDI descriptor" is not limited to the example illustrated in FIG. 30.

[0181]

In this manner, also it is possible to apply the present invention to a broadcasting system which carries out NRT broadcasting.

[0182]

It is to be noted that the present invention may naturally be applied to a broadcasting system which broadcasts in accordance with the ATSC-M/H system described hereinabove or a broadcasting system which broadcasts the NRT broadcasting by a system other than the line broadcasting systems.

[0183]

In the foregoing, the client 12 in the broadcasting system 10 acquires content which meets the needs of the user from within broadcast content through an interaction

with the user. However, it is possible to allow a user to carry out an interaction during reproduction of content acquired in this manner so that content relating to the content being reproduced can be acquired.

[0184]

Thus, in the following description, an embodiment of a broadcasting system which allows a user to carry out an interaction during reproduction of content to acquire content relating to the content being reproduced is described.

[0185]

<2. Second Embodiment>

[Example of Functional Configuration of Server]

First, an example of a functional configuration of a server 11 in a broadcasting system 10 wherein a script is executed to carry out interaction with a user is described with reference to FIG. 31.

[0186]

The server 31 of FIG. 31 is configured from a PDI-S generator 311, a trigger generator 312, a content distributor 313, a content accumulation section 314, a transmission section 315, a PDI-S execution section 316 and a metadata distributor 317.

[0187]

The PDI-S generator 311 generates a PDI-S (Preference Demographic and Interest Script) which is a script for obtaining a user side PDI-A representative of an answer of a user of the client 12 to a question about the tastes of the user (viewer). Then, the PDI-S generator 311 transmits the generated PDI-S to the client 12 through the transmission section 315 and supplies the generated PDI-S to the PDI-S execution section 316. The PDI-S includes a Web browser, other applications and so forth.

[0188]

The trigger generator 312 generates trigger information which is information relating to execution of the PDI-S generated by the PDI-S generator 311 in the client 12 and supplies the generated information to the content distributor 313. Details of the trigger information are hereinafter described with reference to FIG. 35.

[0189]

The content distributor 313 acquires content accumulated in the content accumulation section 314 and stores the trigger information from the trigger generator 312 into the content and then transmits the content to the client 12 through the transmission section 315.

Further, the content distributor 313 acquires content specified by the metadata distributor 317 from within the content accumulated in the content accumulation section 314 and transmits the acquired content to the client 12 through the transmission section 315.

[0190]

The content accumulation section 314 accumulates various kinds of content to be distributed to the client 12. The content accumulation section 314 accumulates not only content (hereinafter referred to as broadcasting content) broadcast as digital television programs but also content (hereinafter referred to as related content) relating to the broadcasting content such as, for example, commercial videos of sponsors of the broadcasting content, images of coupons of products or services provided by the sponsors and so forth.

[0191]

The transmission section 315 transmits various kinds of data supplied thereto from the PDI-S generator 311, content distributor 313 and metadata distributor 317 to the client 12.

[0192]

The PDI-S execution section 316 executes a PDI-S from the PDI-S generator 311 to generate a provider side

PDI-A representative of an answer, which is set on the provider side, to the question about the tastes of the user of the client 12 and then supplies the generated PDI-A to the metadata distributor 317.

[0193]

The metadata distributor 317 specifies (inquires about) content (related content) corresponding to the answer set on the provider side from within the content accumulated in the content accumulation section 314 based on the provider side PDI-A from the PDI-S execution section 316. The metadata distributor 317 generates content metadata including the PDI-A as content metadata of the specified related content and transmits the generated data to the client 12 through the transmission section 42.

[0194]

[Example of Functional Configuration of Client]

Now, an example of a functional configuration of the client 12 in the broadcasting system 10 wherein a script is executed to carry out interaction with a user is described with reference to FIG. 32.

[0195]

The client 12 of FIG. 32 is configured from a reception section 321, a content filter 322, a content

reproduction section 323, a content accumulation section 324, a PDI-S execution section 325 and a PDI-A storage section 326.

[0196]

The reception section 321 receives various kinds of data transmitted thereto from the server 11 and supplies the received data to the content filter 322 and the PDI-S execution section 325.

[0197]

The content filter 322 filters the broadcasting content transmitted thereto from the server 11 through the reception section 321 based on the content metadata of the broadcasting content. Further, the content filter 322 reads out a user side PDI-A from the PDI-A storage section 326 and filters the related content based on the user side PDI-A and the provider side PDI-A included in the content metadata of the related content transmitted from the server 11. The content filter 322 supplies, in response to a result of the filtering, the filtered content (broadcasting content and related content) to the content reproduction section 323 or the content accumulation section 324.

[0198]

The content reproduction section 323 reproduces the

content from the content filter 322. Further, the content reproduction section 323 acquires the content from the content accumulation section 324 and reproduces the acquired content. Further, the content reproduction section 323 includes a trigger detection section 323a. The trigger detection section 323a detects trigger information stored in the broadcasting content distributed from the server 11.

[0199]

The content accumulation section 324 accumulates (records) the content from the content filter 322 therein.

[0200]

The PDI-S execution section 325 executes the PDI-S transmitted from the server 11 based on detection of the trigger information stored in the broadcasting content by the trigger detection section 323a to generate a user side PDI-A representative of an answer of the user to the question about the tastes of the user of the client 12, and supplies the generated PDI-A to the PDI-A storage section 326.

[0201]

The PDI-A storage section 326 stores the user side PDI-A from the PDI-S execution section 325. The user side PDI-A stored in the PDI-A storage section 326 is suitably

read out to the content filter 322.

[0202]

[Example of Transmission and Reception Process of Content]

Now, a transmission and reception process of content in the broadcasting system 10 configured from the server 11 of FIG. 31 and the client 12 of FIG. 32 is described with reference to a flow chart of FIG. 33.

[0203]

On the provider side such as a broadcasting organization, if a sponsor of broadcasting content to be broadcast (distributed) or the broadcasting organization itself issues a request for distribution of content to a viewer having a particular taste or attribute, then the PDI-S generator 311 of the server 11 generates, in response to operation of the staff of the provider side, a PDI-S for obtaining a user side PDI-A representative of an answer of a viewer, that is, a user of the client 12 to a question about what taste or attribute the user has at step S111.

[0204]

[Another Example of Syntax of XML Schema]

Here, another example of syntax of an XML schema for configuring a PDI-S and a PDI-A in the present

embodiment is described with reference to FIG. 34.

[0205]

It is to be noted that the 1st to 44th rows of the syntax illustrated in FIG. 34 are same as the 1st to 44th rows of the syntax illustrated in FIG. 6, respectively, and therefore, description of them is omitted herein.

[0206]

The 45th to 50th rows indicate a declaration of elements of a question defined under the name of "QAA" (question whose question type is "AnyAnswerType") among the questions declared in the fifth to ninth rows. An id element indicated in the 47th row represents an ID for identifying the item of the question, and the format thereof is defined by a format ("providerName:[category:]question-ID") similar to that of a provider-unique filtering parameter.

[0207]

In particular, a question defined by the name of "QAA" (question whose question type is "AnyAnswerType") and an answer to the question are each classified into a provider-unique filtering parameter. It is to be noted that, since a question defined under the name of "QAA" does not restrict the type of an answer, such question (q element) is not defined in the 45th to 50th rows.

[0208]

Further, an answer (a element) to a question defined under the name of "QAA" can have a format in which only the provider by which the question is set can grasp the substance as hereinafter described. Therefore, the answer is hereinafter referred to as provider-unique filtering parameter of the provider-hiding format.

[0209]

Referring back to the flow chart of FIG. 33, at step S112, the PDI-S generator 311 of the server 11 generates PDI-S reference information which is information referred to when the generated PDI-S is executed by the client 12 and supplies the generated information to the trigger generator 312. The PDI-S reference information is used, for example, as a URL (Uniform Resource Locator) of a Web page.

[0210]

At step S113, the trigger generator 312 generates trigger information which is information relating to execution of the PDI-S in the client 12 based on the PDI-S reference information from the PDI-S generator 311 and supplies the generated information to the content distributor 313. When the trigger information is supplied from the trigger generator 312, the content distributor

313 acquires the broadcasting content distributed to the client 12 from the content accumulation section 314. Then, the content distributor 313 places the trigger information into the acquired broadcasting content (as a part of the same) and then supplies the resulting information to the transmission section 315.

[0211]

Here, a configuration of the trigger information is described with reference to FIG. 35.

[0212]

As illustrated in FIG. 35, trigger information 340 is configured from a trigger ID 341, PDI-S controlling information 342 and PDI-S reference information 343.

[0213]

The trigger ID 341 is information for identifying the trigger information. The PDI-S controlling information 342 is information for controlling starting or stopping of the PDI-S in the client 12. As described hereinabove, the PDI-S reference information 343 is information as a URL or the like which is referred to when the PDI-S is executed.

[0214]

Referring back to the flow chart of FIG. 33, the transmission section 315 distributes the broadcasting

content including the trigger information from the content distributor 313 together with the PDI-S generated by the PDI-S generator 311. It is to be noted that the PDI-S may be distributed as content metadata of the broadcasting content or may be distributed before the broadcasting content is distributed.

[0215]

Further, while it is described that the trigger information is distributed in a state in which it is placed in the broadcasting content, the trigger information may be distributed otherwise in a state in which it is multiplexed in a stream of the broadcasting content or may be distributed so as to be synchronized with distribution of the broadcasting content separately from the broadcasting content.

[0216]

Then, after the broadcasting content and the PDI-S are distributed from the server 11 in this manner, at step S131, the reception section 321 of the client 12 receives the broadcasting content and the PDI-S distributed from the server 11. The received broadcasting content is supplied to the content filter 322 and the PDI-S is supplied to the PDI-S execution section 325.

[0217]

If the broadcasting content supplied to the content filter 322 is filtered by the content filter 322 based on the content metadata and it is decided that the filtered content is content which meets the tastes of the user, then the resulting content is supplied to the content reproduction section 323. The content reproduction section 323 reproduces the broadcasting content at step S132.

[0218]

After the reproduction of the broadcasting content is started, the trigger detection section 323a of the content reproduction section 323 monitors the broadcasting content being reproduced and detects the stored trigger information.

[0219]

In particular, at step S133, the trigger detection section 323a decides whether or not the trigger information is detected, and the process at step S132 is repetitively carried out until the trigger information is detected. If it is decided at step S133 that the trigger information is detected, then the trigger detection section 323a supplies the detected trigger information to the PDI-S execution section 325 and the processing advances to step S134.

[0220]

At step S134, the PDI-S execution section 325 executes the PDI-S based on the trigger information from the trigger detection section 323a to generate a user side PDI-A.

[0221]

Here, the process by the PDI-S execution section 325 is described with reference to FIGS. 36 and 37.

[0222]

It is assumed that, as the broadcasting content from the server 11 is reproduced by the content reproduction section 323, such a program of soccer relay broadcasting as shown in FIG. 36 is displayed on the display section not shown of the client 12.

[0223]

If the trigger information is detected by the trigger detection section 323a at a predetermined timing at which the broadcasting content is being reproduced, then the trigger information is supplied to the PDI-S execution section 325. Thus, the PDI-S execution section 325 starts up the PDI-S based on the PDI-S controlling information and the PDI-S reference information included in the trigger information.

[0224]

It is to be noted that the number of pieces of the trigger information placed in the broadcasting content is not limited to one. For example, the PDI-S is started up based on the PDI-S controlling information of the trigger information detected first, and a predetermined Web page is referred to by the PDI-S reference information. Further, execution of the PDI-S is stopped by the PDI-S controlling information of the trigger information detected next.

[0225]

After the PDI-S is started up, the PDI-S execution section 325 displays a screen image corresponding to a question defined by the PDI-S on the displaying section not shown. Then, the PDI-S execution section 325 generates a user side PDI-A representative of an answer to the question in response to selection or inputting by the user (viewer) of the client 12.

[0226]

In particular, as shown in FIG. 37, the PDI-S execution section 325 displays a PDI-S execution screen image 350 in a superposed relationship with the program of the soccer relay broadcasting displayed on the display section not shown. If any one of sponsors, as a question defined by the PDI-S, of the program being broadcasted is

selected, then, during the program broadcast, a message to the effect that special free content can be downloaded and icons 350a to 350e which are choices as candidates for an answer to the question and represent sponsors are displayed on the PDI-S execution screen image 350 in FIG. 37.

[0227]

In FIG. 37, the icon 350a represents a beer manufacturing company; the icon 350b represents a sporting goods manufacturer; and the icon 350c represents a soft drink sales company. Further, the icon 350d represents a fast food chain and the icon 350e represents an electronic equipment manufacturer.

[0228]

If one of the icons 350a to 350e is selected by the user on the PDI-S execution screen image 350 shown in FIG. 37, then the PDI-S execution section 325 generates a user side PDI-A representative of an answer corresponding to the selected icon from among candidates for an answer to the question defined by the PDI-S. In FIG. 37, the icon 350e is selected by the user and displayed in a surrounded state by a frame for indicating that the icon 350e is selected by the user.

[0229]

[Example of PDI-A]

Here, an example of a PDI-A user side PDI-A generated by the PDI-S execution section 325 is described with reference to FIGS. 38 and 39.

[0230]

FIG. 38 illustrates an example of an answer of the user generated with regard to the question presented in the PDI-S execution screen image 350 described hereinabove with reference to FIG. 37. In particular, `<id>ProviderA:ProgramX:123</id>` in the third row indicates an id element of the question presented in the PDI-S execution screen image 350 shown in FIG. 37, and `<a>Somy` in the fourth row indicates, as an answer to the question, an answer corresponding to the icon 350e selected on the PDI-S execution screen image 350. `<a>Somy` is a provider-unique filtering parameter.

[0231]

FIG. 39 illustrates another example of an answer of the user generated with regard to the question presented in the PDI-S execution screen image 350 described hereinabove with reference to FIG. 37. In particular, `<id>ProviderA:ProgramX:0000123</id>` in the third row indicates an id element of the question presented in the PDI-S execution screen image 350 shown in FIG. 37, and

<a>WU5Uq== in the fourth row indicates, as an answer to the question, an answer corresponding to the icon 350e selected on the PDI-S execution screen image 350.

[0232]

Here, if it is assumed that the type of the question of "ProviderA:ProgramX:0000123" is "AnyAnswerType" described hereinabove, then the answer <a>WU5Uq== to the question is a provider-unique filtering parameter of a provider hiding format whose substance can be grasped only by the provider who sets the question. The filtering parameter is encoded by a method such as, for example, Base64. In particular, the provider-unique filtering parameter is configured such that it cannot be used as a filtering parameter by any other provider.

[0233]

The PDI-S execution section 325 supplies and stores the user side PDI-A generated in such a manner as described above to and into the PDI-A storage section 326.

[0234]

Referring back to the flow chart of FIG. 33, at step S115, the PDI-S execution section 316 of the server 11 generates a provider side PDI-A to the question defined by the PDI-S from the PDI-S generator 311 and

supplies the generated PDI-A to the metadata distributor 317. In particular, the PDI-S execution section 316 analyzes or executes the PDI-S in response to an operation of the staff of the broadcasting station (provider side) and causes the display section not shown to display a screen image corresponding to the question defined by the PDI-S, for example, such a PDI-S execution screen image 350 as shown in FIG. 37. Then, the PDI-S execution section 316 generates a provider side PDI-A representative of an answer to the question. At this time, the staff of the broadcasting station would analyze or execute the PDI-S to urge the user to select an answer corresponding to the related content to be distributed as an answer to the question defined by the PDI-S. In particular, the provider side PDI-A generated by the PDI-S execution section 316 represents information (answer) for causing the viewer to acquire the related content distributed later with the tastes of the user (viewer) of the client 12 taken into consideration by the provider side.

[0235]

At step S116, the metadata distributor 317 specifies (inquires about) related content corresponding to the provider side PDI-A from within the content

accumulated in the content accumulation section 314 based on the provider side PDI-A from the PDI-S execution section 316. The related content specified here is a commercial video of a sponsor of the broadcasted content, an image of a coupon of a product or a service provided by the sponsor or the like, which are selected in advance as content which the provider wants to cause the user to acquire. It is to be noted that the related content specified by the metadata distributor 317 is acquired from the content accumulation section 314 by the content distributor 313.

[0236]

At step S117, the metadata distributor 317 newly generates content metadata including the provider side PDI-A based on the content metadata applied in advance to the content specified at step S116 and the provider side PDI-A from the PDI-S execution section 316.

[0237]

At step S118, the transmission section 315 distributes the acquired related content to the content distributor 313 together with the content metadata generated by the metadata distributor 317.

[0238]

In this manner, as an answer to a question defined

by a PDI-S, content having content metadata including a provider side PDI-A representative of an answer intended by the provider side, in other words, related content which meets the tastes of the user and whose acquisition by the user is expected by the provider side is distributed.

[0239]

It is to be noted that the processes at steps S115 to S118 need not successively be executed immediately after the process at step S114, and, in the client 12 which each user has, the processes may be executed before the user side PDI-A is generated and stored.

[0240]

Further, while the related content is distributed together with the content metadata at step S118, the related content may not be distributed together with the content metadata. After the content metadata including the provider side PDI-A is transmitted in advance to the client 12, the related content corresponding to the transmitted content metadata may be distributed.

[0241]

After the related content and the content metadata are distributed from the server 11 in such a manner as described above, at step S135, the reception section 321

of the client 12 receives the related content and the content metadata distributed from the server 11 and then supplies the received content and metadata to the content filter 322. It is to be noted that the processes after step S135 may be executed in parallel to reproduction of the broadcasting content or may be executed after ending of reproduction of the broadcasting content.

[0242]

At step S136, the content filter 322 carries out matching between the user side PDI-A stored in the PDI-A storage section 326 and the provider side PDI-A included in the content metadata from the server 11.

[0243]

[Example of Matching Process in Content Filter]

Here, it is assumed that the PDI-A described with reference to FIG. 38 is generated and stored as the user side PDI-A, and it is assumed that the PDI-A illustrated in FIG. 40 is transmitted as the provider side PDI-A from the server 11.

[0244]

Since the provider side PDI-A shown in FIG. 40 has a basic configuration same as that of the user side PDI-A shown in FIG. 38, detailed description is omitted herein. However, the provider side PDI-A indicates that "Somy" is

selected as an answer to the question of

"ProviderA:ProgramX:123."

[0245]

At this time, the content filter 322 compares the user side PDI-A and the provider side PDI-A with each other and decides that the user side PDI-A and the provider side PDI-A match each other if at least one of the answers to the questions coincides. On the other hand, if none of the answers to the questions coincide, then the content filter 322 decides that the user side PDI-A and the provider side PDI-A do not match each other. In the present case, the PDI-As coincide with each other in that both of the answer to the question of "ProviderA:ProgramX:123" in the user side PDI-A illustrated in FIG. 38 and the answer to the question of "ProviderA:ProgramX:123" in the provider side PDI-A illustrated in FIG. 40 are "Somy." Therefore, it is decided that the user side PDI-A and the provider side PDI-A match each other.

[0246]

Further, it is assumed that the PDI-A described with reference to FIG. 39 is generated and stored as the user side PDI-A, and it is assumed that the PDI-A illustrated in FIG. 41 is transmitted as the provider

side PDI-A from the server 11.

[0247]

The provider side PDI-A illustrated in FIG. 41 indicates that "WU5PU==" (provider hiding format of "Somy") is selected as an answer to the question of "ProviderA:ProgramX:0000123."

[0248]

In this instance, the PDI-As coincide with each other in that both of the answer to the question of "ProviderA:ProgramX:0000123" in the user side PDI-A illustrated in FIG. 39 and the answer to the question of "ProviderA:ProgramX:0000123" in the provider side PDI-A illustrated in FIG. 41 are "WU5PUq==." Therefore, it is decided that the user side PDI-A and the provider side PDI-A match each other.

[0249]

Now, it is assumed that the PDI-A illustrated in FIG. 42 is transmitted as the provider side PDI-A from the server 11.

[0250]

The provider side PDI-A illustrated in FIG. 42 indicates that "UGFuYXNvbmlj" (provider hiding format) is selected as an answer to the question of "ProviderA:ProgramX:0000123."

[0251]

In this instance, the answer to the question in the user side PDI-A illustrated in FIG. 39 and the answer to the question in the provider side PDI-A illustrated in FIG. 42 do not coincide with each other. Therefore, it is decided that the user side PDI-A and the provider side PDI-A do not match each other.

[0252]

The content filter 322 carries out the matching process between the user side PDI-A and the provider side PDI-A in such a manner as described above.

[0253]

At step S137, the content filter 322 decides whether or not the user side PDI-A and the provider side PDI-A match each other. If it is decided at step S137 that the user side PDI-A and the provider side PDI-A match each other, then the content filter 322 decides that the content distributed from the server 11 is related content which meets the tastes of the user (viewer) of the client 12. Thus, the content filter 322 supplies the content to the content accumulation section 324. Thereafter, the processing advances to step S138.

[0254]

At step S138, the content accumulation section 324

accumulates (records) the content therein. In accordance with an operation instruction by the user, the accumulated content is suitably supplied to and reproduced (displayed) by the content reproduction section 323.

[0255]

On the other hand, if it is decided at step S137 that the user side PDI-A and the provider side PDI-A do not match each other, then the content filter 322 decides that the related content distributed from the server 11 is not content which meets the tastes of the user (viewer) of the client 12 and discards (deletes) the related content. Then, the processing ends.

[0256]

In this manner, related content is selectively downloaded in response to a result of matching. It is to be noted that an effective date of the user side PDI-A may be set to the user side PDI-A such that, even after broadcasting of the broadcasting content ends, if the effective date of the user side PDI-A does not expire, then the related content can be downloaded.

[0257]

With the processing described above, in the broadcasting system, on the provider side, a PDI-S for

obtaining a user side PDI-A to a question about the tastes of the user is generated by the server and trigger information relating to execution of the PDI-S in the client terminal is generated. Then, in response to distribution of broadcasting content, the PDI-S and the trigger information are transmitted to the client terminal. Then, in response to the distribution of the related content, a provider side PDI-A representative of an answer set on the provider side to the PDI-S is distributed as content metadata of the corresponding related content. Consequently, as the content metadata, content metadata which meets the needs of the user who is viewing the broadcasting content can be applied to the related content. On the other hand, on the user side, the trigger information in the broadcasting content being broadcasted is detected by the client terminal, and the PDI-S from the server is executed to generate a user side PDI-A. Then, the matching between the generated user side PDI-A and the provider side PDI-A from the server is carried out to decide whether or not the related content distributed from the server is to be acquired. Consequently, the related content can be filtered with the content metadata which meets the needs of the user who is viewing the broadcasting content. Accordingly,

content which meets the needs at the time can be acquired. Particularly, content which meets a feeling or the tastes of the user who is viewing the broadcasting content can be acquired.

[0258]

Further, since an interaction with the user can be carried out by the PDI-S on the client terminal, even if a question set on the provider side includes the substance which requires a high degree of interactivity, an interaction with the user can be carried out sufficiently. Consequently, the user side PDI-A on which the tastes of the user are reflected accurately can be generated and content which meets the needs of the user at the time can be acquired with higher certainty.

[0259]

It is to be noted that, in the foregoing description, the related content is a commercial video of a sponsor of broadcasting content, an image of a coupon of a commodity or a service provided by the sponsor, or the like. However, the related content may otherwise be information or the like relating to a performer of a digital television program (in the case of a soccer relay broadcasting program, a soccer player) being broadcasted (distributed) as broadcasting content. Or, the related

content may be a digital television program itself which meets the tastes of the user at the time.

[0260]

It is to be noted that, also in a broadcasting system wherein a script is executed to carry out an interaction with a user, one of a user side PDI-A and a provider side PDI-A may be represented as a query which evaluates the PDI-A to compare the user side PDI-A and the provider side PDI-A with each other to carry out matching.

[0261]

In the following, a configuration wherein one of a user side PDI-A and a provider side PDI-A is represented as a query to compare the user side PDI-A and the provider side PDI-A with each other is described.

[0262]

[Example 3 of Matching Process by Query Which Evaluates PDI-A]

First, a configuration wherein a provider side PDI-A is represented as a query to compare a user side PDI-A and the provider side PDI-A with each other is described.

[0263]

FIG. 43 shows an example of a configuration of the server 11 which represents a provider side PDI-A as a

query.

[0264]

The server 11 of FIG. 43 is configured from a PDI-S generator 311, a trigger generator 312, a content distributor 313, a content accumulation section 314, a transmission section 315, a PDI-S execution section 391, and a metadata distributor 392.

[0265]

It is to be noted that components of the server 11 of FIG. 43 which have functions similar to those provided in the server 11 of FIG. 31 are denoted by like names and like reference characters, and description of them is suitably omitted herein.

[0266]

In particular, the server 11 of FIG. 43 is different from the server 11 of FIG. 31 in that it includes the PDI-S execution section 316 and the metadata distributor 317 in place of the PDI-S execution section 391 and the metadata distributor 392.

[0267]

The PDI-S execution section 391 executes a PDI-S from the PDI-S generator 311 to generate a provider side PDI-A representative of an answer set by the provider side to a question about the tastes of a user of the

client 12. Then, the PDI-S execution section 391 generates a PDI-A query in which the generated provider side PDI-A is applied to a predetermined conditional statement and supplies the generated PDI-A query to the metadata distributor 392.

[0268]

The metadata distributor 392 specifies (inquires about), based on the PDI-A query from the PDI-S execution section 391, related content corresponding to the PDI-A query from within the content accumulated in the content accumulation section 45. The metadata distributor 392 generates content metadata including the PDI-A query as content metadata of the specified related content and transmits the generated content metadata to the client 12 through the transmission section 315.

[0269]

Further, the client 12 in the present example is same as the client 12 of FIG. 32 except that the content filter 322 of FIG. 32 reads out a user side PDI-A from the PDI-A storage section 326 and filters content based on the user side PDI-A and the PDI-A query included in the content metadata transmitted from the server 11. Therefore, description of the client 12 is omitted herein.

[0270]

Now, a transmission and reception process of content in the broadcasting system 10 which includes the server 11 of FIG. 43 is described with reference to a flow chart of FIG. 44.

[0271]

It is to be noted that processes at steps S151 to S154, S158, S171 to S175, S177 and S178 of the flow chart of FIG. 44 are basically similar to the processes at steps S111 to S114, S118, S131 to S135, S137 and S138 of the flow chart of FIG. 33, respectively. Therefore, description of them is omitted herein.

[0272]

In particular, at step S155, the PDI-S execution section 391 of the server 11 generates a provider side PDI-A to a question defined in a PDI-S from the PDI-S generator 311, generates a PDI-A query in which the generated provider side PDI-A is applied to a predetermined conditional expression, and supplies the PDI-A query to the metadata distributor 392. More particularly, for example, the PDI-S execution section 391 analyzes or executes the PDI-S in response to an operation of the staff of the broadcasting station (provider side) and causes the display section not shown to display, for example, such a screen image

corresponding to a question defined in the PDI-S as the PDI-S execution screen image 350 shown in FIG. 37. Then, the PDI-S execution section 391 sets an answer to the question and further causes the staff of the broadcasting station to determine a combination (filtering condition) of such answers to generate a PDI-A query representative of the combination of the answers. At this time, the staff of the broadcasting station would cause the PDI-S to be analyzed or executed to select an answer corresponding to content to be distributed and then determine a combination of such answers as an answer to the questions defined in the PDI-S. In particular, the PDI-A query generated by the PDI-S execution section 391 represents information (combination of answers) for allowing a user (viewer) of the client 12 to view content to be distributed later taking the tastes of the viewer of the client 12 into consideration on the provider side. [0273]

At step S156, the metadata distributor 392 specifies (inquires about), based on the PDI-A query from the PDI-S execution section 391, related content corresponding to the PDI-A query from within the content accumulated in the content storage section 314. The related content specified here may be that content

selected in advance as content to be acquired by the user by the staff of the broadcasting station. It is to be noted that the content specified by the metadata distributor 392 is acquired from the content storage section 314 by the content distributor 313.

[0274]

At step S157, the metadata distributor 392 newly generates, based on content metadata applied in advance to the related content specified at step S156 and the PDI-A query from the PDI-S execution section 391, content metadata including the PDI-A query.

[0275]

Then at step S176, the content filter 322 of the client 12 carries out, based on the PDI-A included in the content metadata from the server 11, matching of the user side PDI-A stored in the PDI-A storage section 53.

[0276]

Here, it is assumed that the PDI-A described hereinabove with reference to FIG. 39 has been generated and stored as the user side PDI-A and a PDI-A query given below has been transmitted from the server 11.

```
“//QSA[id='ProviderA:0000123' and a='WU5PUq==']”
```

[0277]

The PDI-A query given above indicates that the user

side PDI-A evaluates whether or not "WU5PUq==" (provider hiding format of "Somy") is selected as an answer to the question of "ProviderA:ProgramX:0000123."

[0278]

At this time, the content filter 322 evaluates the user side PDI-A based on the PDI-A query, and if the user side PDI-A satisfies (is true to) the PDI-A query, then the content filter 322 decides that the user side PDI-A and the PDI-A query match each other. However, if the user side PDI-A does not satisfy (is false to) the PDI-A query, then the content filter 322 decides that the user side PDI-A and the PDI-A query do not match each other. In this instance, in the user side PDI-A illustrated in FIG. 39, since "ProviderA:ProgramX:0000123" is selected as an answer to the question of "WU5PUq==," the user side PDI-A and the PDI-A query are decided to match each other.

[0279]

Since a more complicated filtering condition is represented by a PDI-A query set by the provider side in this manner, it is possible to allow a user (viewer) to acquire content expected by the provider side with a higher degree of certainty.

[0280]

[Example 4 of Matching Process by Query Wherein PDI-A Is

Evaluated]

Now, a configuration wherein a user side PDI-A is represented as a query and the user side PDI-A and a provider side PDI-A are compared with each other is described.

[0281]

FIG. 45 shows an example of a functional configuration of the client 12 wherein a user side PDI-A is represented as a query.

[0282]

The client 12 of FIG. 46 is configured from a reception section 321, a content filter 322, a content reproduction section 323, a content accumulation section 324, a PDI-S execution section 401, and a PDI-A query storage section 402.

[0283]

It is to be noted that, in the client 12 of FIG. 45, components having functions similar to those provided in the client 12 of FIG. 32 are denoted by like names and like reference characters, and description of them is suitably omitted herein.

[0284]

In particular, the client 12 of FIG. 45 is different from the client 12 of FIG. 32 in that it

includes the PDI-S execution section 401 and the PDI-A query storage section 402 in place of the PDI-S execution section 325 and the PDI-A storage section 326.

[0285]

The PDI-S execution section 401 executes a PDI-S transmitted thereto from the server 11 to generate a user side PDI-A which represents an answer of a user of the client 12 to a question about the tastes of the user. Then, the PDI-S execution section 401 generates a PDI-A query in which the generated user side PDI-A is applied to a predetermined conditional expression and supplies the generated PDI-A query to the PDI-A query storage section 402.

[0286]

The PDI-A query storage section 402 stores the PDI-A query from the PDI-S execution section 401. The PDI-A query stored in the PDI-A query storage section 402 is suitably read out to the content filter 322.

[0287]

It is to be noted that the content filter 322 of FIG. 45 reads out the PDI-A query from the PDI-A query storage section 402 and filters content based on the PDI-A query and a provider side PDI-A included in content metadata transmitted from the server 11.

[0288]

Further, the server 11 in the present example is same as the server 11 of FIG. 31, and therefore, description of the same is omitted herein.

[0289]

Now, a content transmission and reception process in the broadcasting system 10 which includes the client 12 of FIG. 46 is described with reference to a flow chart of FIG. 46.

[0290]

It is to be noted that processes at steps S211 to S233, S235, S237 and S238 of the flow chart of FIG. 46 are basically similar to the processes at steps S111 to S133, S135, S137 and S138 of the flow chart of FIG. 33, and therefore, description of them is omitted herein.

[0291]

In particular, at step S234, the PDI-S execution section 401 of the client 12 executes a PDI-S to generate a PDI-A query.

[0292]

If trigger information is detected by the trigger detection section 323a at a predetermined timing at which broadcasting content is being reproduced, then the trigger information is supplied to the PDI-S execution

section 325. The PDI-S execution section 325 activates the PDI-S based on PDI-S controlling information included in the trigger information and the PDI-S reference information.

[0293]

[Example of PDI-S Execution Process]

After the PDI-S is activated, the PDI-S execution section 325 causes the display section not shown to display a screen image corresponding to a question defined in the PDI-S to generate an answer to the question in response to a selection or an input of the user (viewer) of the client 12. Furthermore, the PDI-S execution section 401 determines combination of such answers (filtering condition) to generate a PDI-A query representative of the combination of answers.

[0294]

In this manner, the PDI-S execution section 401 executes the PDI-S to interact with the user to generate a PDI-A query which represents answers which reflect the tastes of the user with a high degree of accuracy to the questions defined in the PDI-S.

[0295]

The PDI-S execution section 401 supplies the PDI-A query generated in this manner to the PDI-A query storage

section 402 so as to be stored.

[0296]

At step S236, the content filter 322 carries out, based on the PDI-A query stored in the PDI-A query storage section 402, matching of the provider side PDI-A included in content metadata from the server 11.

[0297]

Here, it is assumed that, as the provider side PDI-A, the PDI-A described hereinabove with reference to FIG. 41 has been transmitted from the server 11, and a PDI-A query given below has been generated and stored.

```
“//QSA[id='ProviderA:ProgramX:0000123' and  
a='WU5PUq==' ]”
```

[0298]

The PDI-A query described above indicates that the provider side PDI-A evaluates whether or not “WU5PUq==” (provider hiding format of “Somy”) is selected as an answer to the question of “ProviderA:ProgramX:0000123.”

[0299]

At this time, the content filter 322 evaluates the provider side PDI-A based on the PDI-A query, and if the provider side PDI-A satisfies (is true to) the PDI-A query, then the content filter 322 decides that the provider side PDI-A and the PDI-A query match each other.

However, if the provider side PDI-A does not satisfy (is false to) the PDI-A query, then the content filter 322 decides that the provider side PDI-A and the PDI-A query do not match each other. In this instance, in the provider side PDI-A illustrated in FIG. 41, since "WU5PUq==" is selected as an answer to the question of "ProviderA:ProgramX:0000123," the provider side PDI-A and the PDI-A query are decided to match each other.

[0300]

Since a more complicated filtering condition is represented by a PDI-A query set by the user side in this manner, it is possible to allow a user to acquire content expected by the user side with a higher degree of certainty.

[0301]

[Example of Application to Broadcasting System Which Broadcasts in ATSC-M/H System]

Incidentally, also the broadcasting system of the embodiment described above can be applied to a broadcasting system which broadcasts in accordance with the ATSC-M/H system.

[0302]

In such an instance, a PDI-A (provider side PDI-A) or a PDI-A query is placed in at least one of a "Service"

fragment (FIG. 23), a "Schedule" fragment (FIG. 24) and a "Content" fragment (FIG. 25) from among elements which configure the Service Guide illustrated in FIG. 22.

[0303]

Meanwhile, a PDI-S is placed in an "Interactivity Data" fragment from among the elements which configure the Service Guide illustrated in FIG. 22.

[0304]

FIG. 47 illustrates details of a configuration of the "Interactivity Data" fragment. A PDI-S is placed into the "Interactive Data" fragment illustrated in FIG. 47 by newly adding a "PDI-S" element to a "PrivateExt" element defined at the lowermost stage. In particular, for example, a "PDI-S" element is represented and encoded in a character string of `<xs:element name = "PDI-S" type = "xs:string" xmlns:xs = "http://www.w3.org/2001/XMLSchema"/>` by an XML schema.

[0305]

[Example of Application to Broadcasting System which Carries Out NRT Broadcasting]

The broadcasting system of the present embodiment can be applied also to a broadcasting system which carries out NRT broadcasting.

[0306]

In such an instance, a PDI-A (provider side PDI-A), a PDI-A query or a PDI-S transmitted from the server 11 to the client 12 in the broadcasting system 10 described hereinabove is placed into and transmitted together with a "PDI descriptor" which is prescribed newly in the SMT or the NRT-IT (FIG. 29).

[0307]

FIG. 48 illustrates an example of syntax of the "PDI descriptor." In FIG. 48, each of descriptors to be described are defined together with a bit number (No. of Bits) and a format (Format).

[0308]

According to the syntax illustrated in FIG. 48, a PDI-A, a PDI-A query or a PDI-S is described in a descriptor "PDI_S or PDI_A or PDI_A_Query" of variable bits.

[0309]

It is to be noted that the broadcasting system of the present embodiment may naturally be applied to a broadcasting system which broadcasts in accordance with the ATSC-M/H system described hereinabove or a broadcasting system which broadcasts in accordance with any other system than that of a broadcasting system which carries out NRT broadcasting.

[0310]

While the series of processes described above can be executed by hardware, it may otherwise be executed by software. In the case where the series of processes is executed by software, a program which constructs the software is installed from a program recording medium into a computer incorporated in hardware for exclusive use, a personal computer, for example, for universal use which can execute various functions by installing various programs, and so forth.

[0311]

The program recording medium in which a program to be installed into a computer and placed into an executable condition by the computer is stored may be, for example, as shown in FIG. 2, a removable medium 31 in the form of a package medium formed from a magnetic disk (including a flexible disk), an optical disk (including a CD-ROM (Compact Disc-Read Only Memory) and a DVD (Digital Versatile Disc)), including a magneto-optical disk), or a semiconductor memory. Else, the program recording medium may be formed as the ROM 22, a hard disk which configures the storage section 28 or the like in which the program is stored temporarily or permanently. Storage of the program into the program recording medium is carried out,

as occasion demands, through the communication section 29 which is an interface such as a router and a modem, making use of a wired or wireless communication medium such as a local area network, the Internet or a digital satellite broadcast.

[0312]

It is to be noted that, in the present specification, steps which describe a program include not only processes which are executed in a time series in the order as described but also processes which may be but need not necessarily be processed in a time series but may be executed in parallel or individually without being processed in a time series.

[0313]

Further, in the present specification, the term system is used to represent an entire apparatus composed of a plurality of apparatus.

[0314]

It is to be noted that the embodiment of the present invention is not limited to the embodiments described hereinabove but various alterations can be made without departing from the subject matter of the present invention.

[Reference Signs List]

[0315]

10 Broadcasting system, 11 Server, 12 Client, 41 PDI-Q generator, 42 Transmission section, 43 PDI-A generator, 44 Metadata distributor, 45 Content accumulation section, 46 Content distributor, 51 Reception section, 52 PDI-A generator, 53 PDI-A storage section, 54 Content filter, 55 Content reproduction section, 56 Content accumulation section, 111 PDI-A query generator, 112 Metadata distributor, 131 PDI-A query generator, 132 PDI-A query storage section, 311 PDI-S generator, 312 Trigger generator, 313 Content distributor, 314 Content accumulation section, 315 Transmission section, 316 PDI-S execution section, 317 Metadata distributor, 321 Reception section, 322 Content filter, 323 Content reproduction section, 323a Trigger detection section, 324 Content accumulation section, 325 PDI-S execution section, 326 PDI-A storage section, 391 PDI-S execution section, 392 Metadata distributor, 401 PDI-S execution section, 402 PDI-A query storage section

What is claimed is:

1.A reception apparatus, comprising:

a receiver configured to receive first content from a service provider; and

circuitry configured to

process the received first content for display to a user as the first content is received by the receiver,

execute an application that is associated with a predetermined portion of the first content while the first content is being displayed to the user, wherein the application causes the circuitry to prompt the user to provide an answer to a Preference, Demographic, and Interest (PDI) question provided by the service provider,

store the answer provided by the user to the PDI question in a memory of the reception apparatus,

determine whether to download second content from the service provider for playback selection by the user based on whether the stored answer provided by the user to the PDI question corresponds to content metadata associated with the second content, and

download the second content based on the determination of whether to download the second content.

2. The reception apparatus according to claim 1, wherein the circuitry is configured to

determine whether to download the second content based on whether the content metadata includes information that matches the stored answer to the PDI question.

3. The reception apparatus according to claim 1, wherein the receiver is a terrestrial broadcast receiver that is configured to receive the first content, the second content, and the content metadata.

4. The reception apparatus according to claim 1, wherein the second content is not processed for display to the user as the second content is being downloaded.

5. The reception apparatus according to claim 1, wherein the application causes the circuitry to store the answer provided by the user in the memory in association with a predetermined question identifier of the PDI question, and

the second content is associated with the content metadata that includes the predetermined question identifier and an answer to the PDI question, corresponding to the predetermined question identifier, that is set by the service provider for the second content.

6. A method of a reception apparatus for downloading content, the method comprising:

receiving, by a receiver of the reception apparatus, first content from a service provider;

processing the received first content for display to a user as the first content is received by the receiver;

executing, by circuitry of the reception apparatus, an application that is associated with a predetermined portion of the first content while the first content is being displayed to the user, the application causing the circuitry to prompt the user to provide an answer to a Preference, Demographic, and Interest (PDI) question provided by the service provider;

storing the answer provided by the user to the PDI question in a memory of the reception apparatus,

determining, by the circuitry, whether to download second content from the service provider for playback selection by the user based on whether the stored answer provided by the user to the PDI question corresponds to content metadata associated with the second content; and

downloading, by the circuitry, the second content based on the determination of whether to download the second content.

7. The method according to claim 6, wherein the determining comprises:

determining whether to download the second content based on whether the content metadata includes information that matches the stored answer to the PDI question.

8. The method according to claim 6, wherein the receiving comprises:

receiving the first content, the second content, and the content metadata, wherein

the receiver is a terrestrial broadcast receiver.

9. The method according to claim 6, wherein the second content is not processed for display to the user as the second content is being downloaded.

10. The method according to claim 6, wherein the storing comprises:

storing, in response to the application, the answer provided by the user in the memory in association with a predetermined question identifier of the PDI question, wherein

the second content is associated with the content metadata that includes the predetermined question identifier and an answer to the PDI question, corresponding to the predetermined question identifier, that is set by the service provider for the second content.

11. A transmission apparatus, comprising:

circuitry configured to

transmit first content from a service provider to a reception apparatus;

provide an application to be executed by the reception apparatus and that is associated with a predetermined portion of the first content while the first content is being displayed to a user of the reception apparatus, wherein the application causes the reception apparatus to prompt the user to provide an answer to a Preference, Demographic, and Interest (PDI) question;

generate content metadata that is associated with second content from the service provider that is downloadable by the reception apparatus; and

transmit the content metadata and the second content to the reception apparatus, wherein

the reception apparatus determines whether to download the second content from the service provider for playback selection by the user based on whether the answer provided by the user to the PDI question corresponds to the content metadata associated with the second content.

12. The transmission apparatus according to claim 11, wherein the circuitry includes a terrestrial broadcast transmitter that is configured to transmit the first content, the second content, and the content metadata.

13. The transmission apparatus according to claim 11, wherein the circuitry is configured to generate the content metadata based on the PDI question.

14. The transmission apparatus according to claim 11, wherein the circuitry is configured to transmit the first content for display in real-time and transmit the second content for display at a different time.

15. The transmission apparatus according to claim 11, wherein

the application causes the reception apparatus to store the answer provided by the user in a memory in association with a predetermined question identifier of the PDI question, and

the content metadata includes the predetermined question identifier and an answer to the PDI question, corresponding to the predetermined question identifier.

16. A method of a transmission apparatus for providing content, comprising:

transmitting, by circuitry of the transmission apparatus, first content from a service provider to a reception apparatus;

providing, by the circuitry, an application to be executed by the reception apparatus and that is associated with a predetermined portion of the first content while the first content is being displayed to a user of the reception apparatus, wherein the application causes the reception apparatus to prompt the user to provide an answer to a Preference, Demographic, and Interest (PDI) question;

generating, by the circuitry, content metadata that is associated with second content from the service provider that is downloadable by the reception apparatus; and

transmitting the content metadata and the second content to the reception apparatus, wherein

the reception apparatus determines whether to download the second content from the service provider for playback selection by the user based on whether the answer provided by the user to the PDI question corresponds to the content metadata associated with the second content.

17. The method according to claim 16, further comprising:

transmitting, by the circuitry, the first content, the second content, and the content metadata, wherein

the circuitry includes a terrestrial broadcast transmitter.

18. The method according to claim 16, wherein the generating comprises:

generating the content metadata based on the PDI question.

19. The method according to claim 16, wherein

the transmitting the first content includes transmitting the first content for display in real-time, and

the transmitting the second content includes transmitting the second content for display at a different time.

20. The method according to claim 16, wherein

the application causes the reception apparatus to store the answer provided by the user in a memory in association with a predetermined question identifier of the PDI question, and

the content metadata includes the predetermined question identifier and an answer to the PDI question, corresponding to the predetermined question identifier.

21. A transmission apparatus which distributes content to a client, comprising:

script generation means for generating a Preference Demographic and Interest script, PDI-S, for obtaining user side answer information which is information representative of an answer of a user of the client to a question about the tastes of the user;

trigger generation means for generating trigger information, which is information relating to execution of the script by the client, wherein the trigger information is configured from a trigger ID, PDI-S controlling information, and PDI-S reference information, wherein the trigger ID is information for identifying the trigger information, PDI-S controlling information is information for controlling starting or stopping of the PDI-S in the client, and the

PDI-S reference information is a URL which is referred to when the PDI-S is executed; and

transmission means for transmitting the trigger information and the script to the client in response to distribution of first content to the client and transmitting, in response to distribution of second content different from the first content to the client, provider side answer information which is information representative of an answer set by a provider providing the first or second content, to the question about the tastes of the user to the client.

22. The transmission apparatus according to claim 21, further comprising:

metadata generation means for generating the metadata including the provider side answer information as the metadata of the second content corresponding to the answer set by the provider, wherein

the transmission means transmits the metadata to the client in response to the distribution of the second content to the client.

23. The transmission apparatus according to claim 21, further comprising:

query generation means for generating a query indicative of a combination of answers to questions about the tastes of the user, wherein

the transmission means transmits the query to the client in response to distribution of the second content to the client.

24. A transmission method for a transmission apparatus which distributes content to a client, comprising:

a script generation step of generating a Preference Demographic and Interest script, PDI-S, for obtaining user side answer information which is information representative of an answer of a user of the client to a question about the tastes of the user;

a trigger generation step of generating trigger information, which is information relating to execution of the script by the client, wherein the trigger information is configured from a trigger ID, PDI-S controlling information, and PDI-S reference information, wherein the trigger ID is information for identifying the trigger information, PDI-S controlling information is information for controlling starting or stopping of the PDI-S in the client, and the PDI-S reference information is a URL which is referred to when the PDI-S is executed; and

a transmission step of transmitting the trigger information and the script to the client in response distribution of first content to the client and transmitting, in response to distribution of second content different from the first content to the client, provider side answer information which is information representative of an answer set by a provider providing the first or second

content, to the question about the tastes of the user to the client.

25. A reception apparatus which acquires content distributed from a server, comprising:

trigger detection means for detecting trigger information, which is information which is transmitted from the server in response to distribution of first content and relates to execution of a predetermined Preference Demographic and Interest script, PDI-S, wherein the trigger information is configured from a trigger ID, PDI-S controlling information, and PDI-S reference information, wherein the trigger ID is information for identifying the trigger information, PDI-S controlling information is information for controlling starting or stopping of the PDI-S in the client, and the PDI-S reference information is a URL which is referred to when the PDI-S is executed;

script execution means for executing a script for obtaining user side answer information which is transmitted from the server in response to the distribution of the first content and which is information representative of an answer of a user to a question about the tastes of the user based on detection of the trigger information; and

matching means for carrying out matching between the user side answer information and provider side answer information which is transmitted from the server in response to distribution of second content different from the first content and which is information representative of an answer set by a provider providing the first or second content to

the question to determine acquisition of the second content distributed from the server.

26. The reception apparatus according to claim 25, wherein the matching means carries out the matching to determine acquisition of the second content corresponding to metadata which includes the provider side answer information.

27. The reception apparatus according to claim 25, wherein the matching means carries out the matching based on the user side answer information and a query indicative of a combination of answers transmitted from the server in response to distribution of the second content and set by the provider to the questions to determine acquisition of the second content distributed from the server.

28. The reception apparatus according to claim 25, wherein the script execution means executes the script for generating a query indicative of a combination of answers of the user to questions about the tastes of the user, and

the matching means carries out the matching based on the query and the provider side answer information transmitted from the server in response to the distribution of the second content to determine acquisition of the second content distributed from the server.

29. A reception method for a reception apparatus which acquires content distributed from a server, comprising:

a trigger detection step of detecting trigger information, which is information which is transmitted from the server in response to distribution of first content and relates to execution of a predetermined Preference Demographic and Interest script, PDI-S, wherein the trigger information is configured from a trigger ID, PDI-S controlling information, and PDI-S reference information, wherein the trigger ID is information for identifying the trigger information, PDI-S controlling information is information for controlling starting or stopping of the PDI-S in the client, and the PDI-S reference information is a URL which is referred to when the PDI-S is executed;

a script execution step of executing a script for obtaining user side answer information which is transmitted from the server in response to the distribution of the first content and which is information representative of an answer of a user to a question about the tastes of the user based on detection of the trigger information; and

a matching step of carrying out matching between the user side answer information and provider side answer information which is transmitted from the server in response to distribution of second content different from the first content and which is information representative of an answer set by a provider providing the first or second content to the question to determine acquisition of the second content distributed from the server.

30. A transmission and reception system configured from a transmission apparatus which distributes content and a reception apparatus which acquires the content distributed from the transmission apparatus,

the transmission apparatus including

script generation means for generating a Preference Demographic and Interest script, PDI-S, for obtaining user side answer information which is information representative of an answer of a user of the reception apparatus to a question about the tastes of the user,

trigger generation means for generating trigger information which is information relating to execution of the script by the reception apparatus, and

transmission means for transmitting the trigger information and the script to the reception apparatus in response to distribution of first content to the reception apparatus and transmitting, in response to distribution of second content different from the first content to the reception apparatus, provider side answer information which is information representative of an answer set by a provider providing the first or second content, to the question about the tastes of the user to the reception apparatus, wherein the trigger information is configured from a trigger ID, PDI-S controlling information, and PDI-S reference information, wherein the trigger ID is information for identifying the trigger information, PDI-S controlling information is information for controlling starting or stopping of the PDI-S in the client, and the PDI-S reference information is a URL which is referred to when the PDI-S is executed,

the reception apparatus including

trigger detection means for detecting the trigger information transmitted from the transmission apparatus in response to the distribution of the first content,

script execution means for executing the script for obtaining the user side answer information transmitted from the transmission apparatus in response to the distribution of the first content based on the detection of the trigger information, and

matching means for carrying out matching between the user side answer information and the provider side answer information transmitted from the transmission apparatus in response to distribution of the second content to determine acquisition of the second content distributed from the transmission apparatus.

FIG. 1

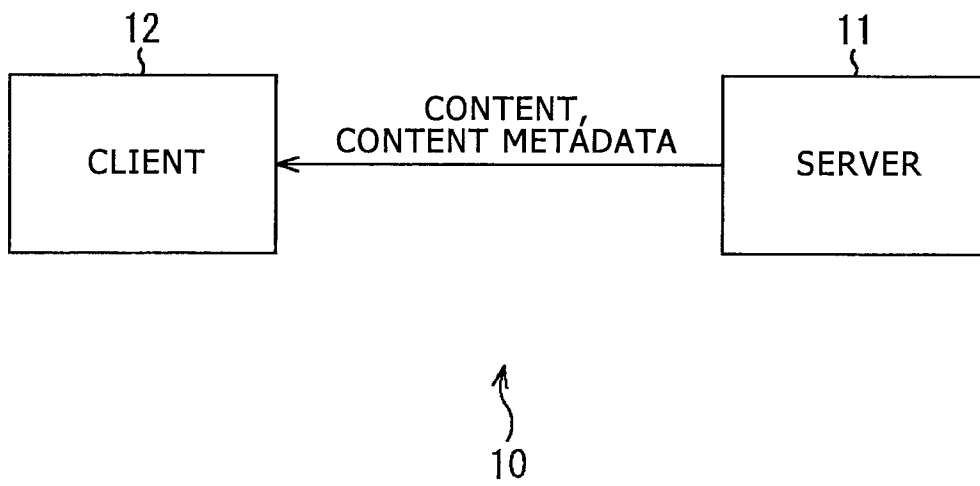
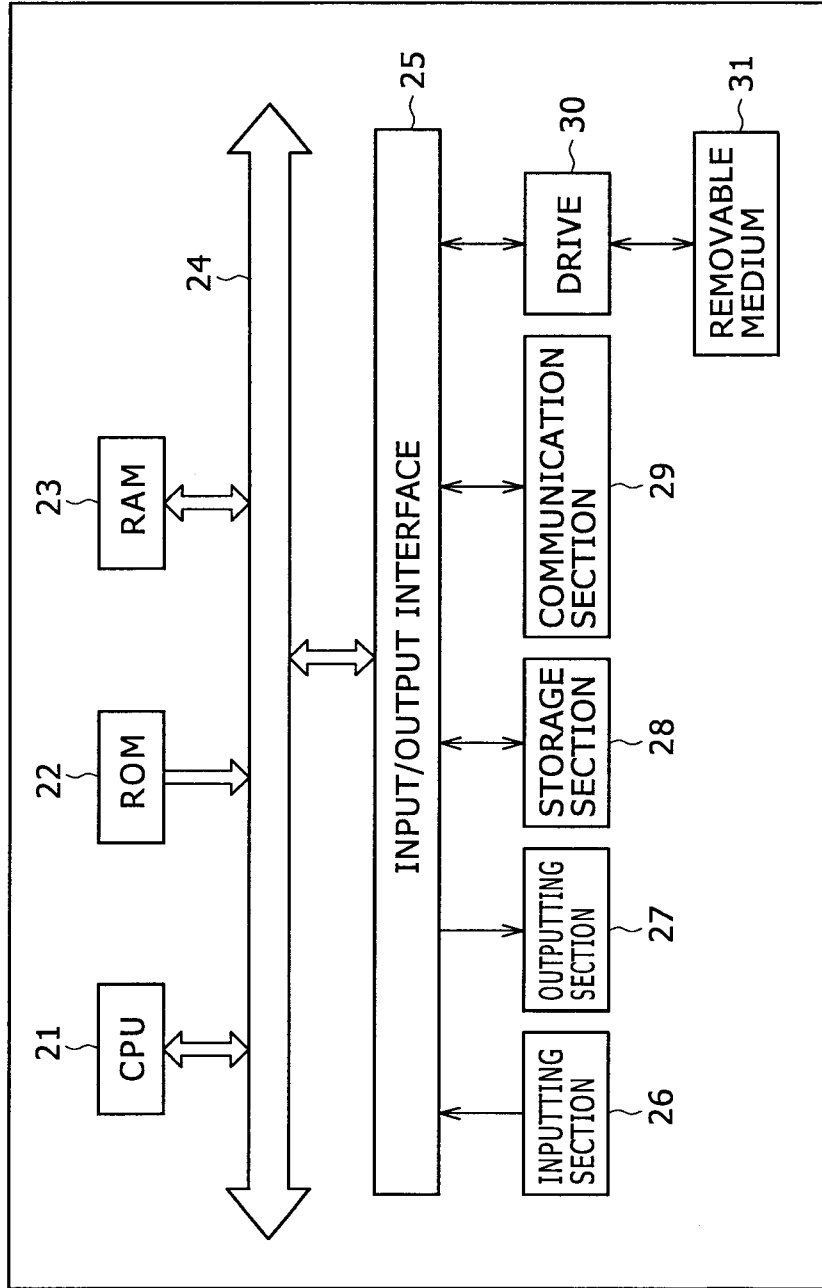


FIG. 2



11

FIG. 3

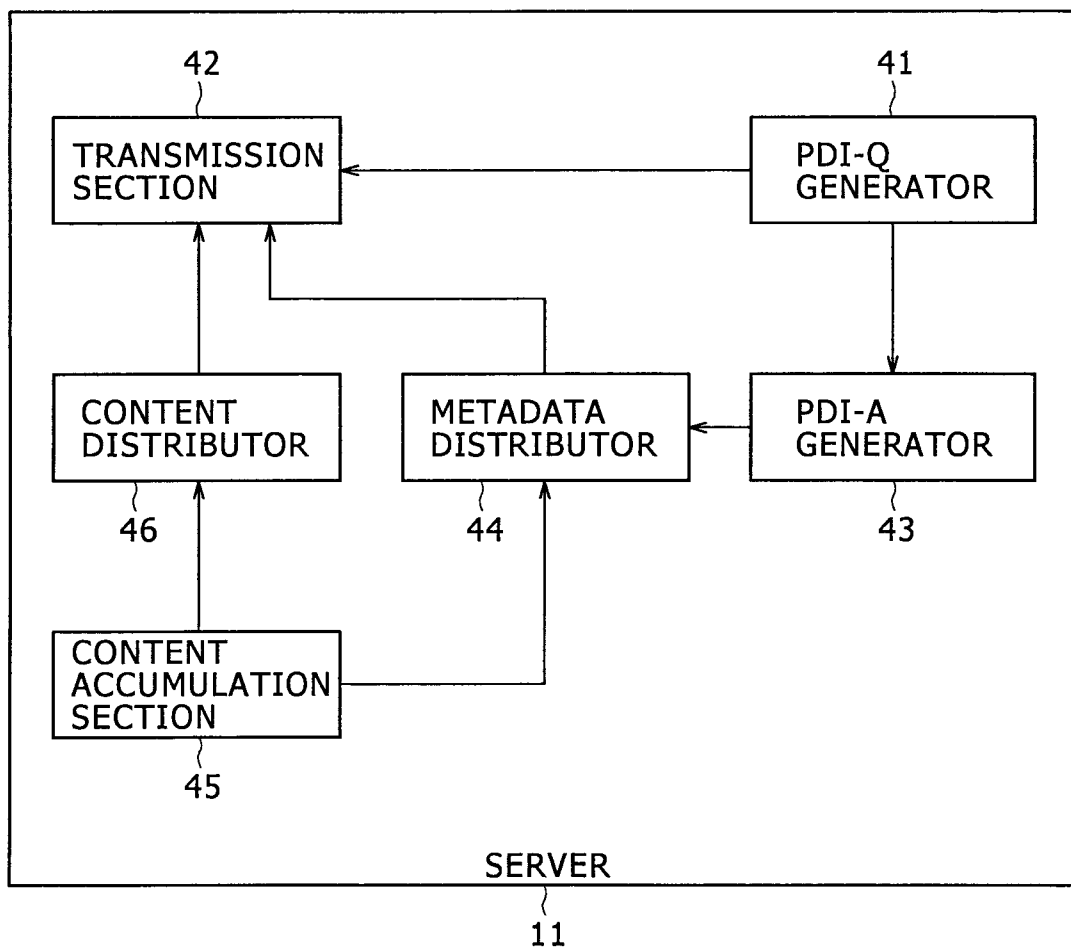
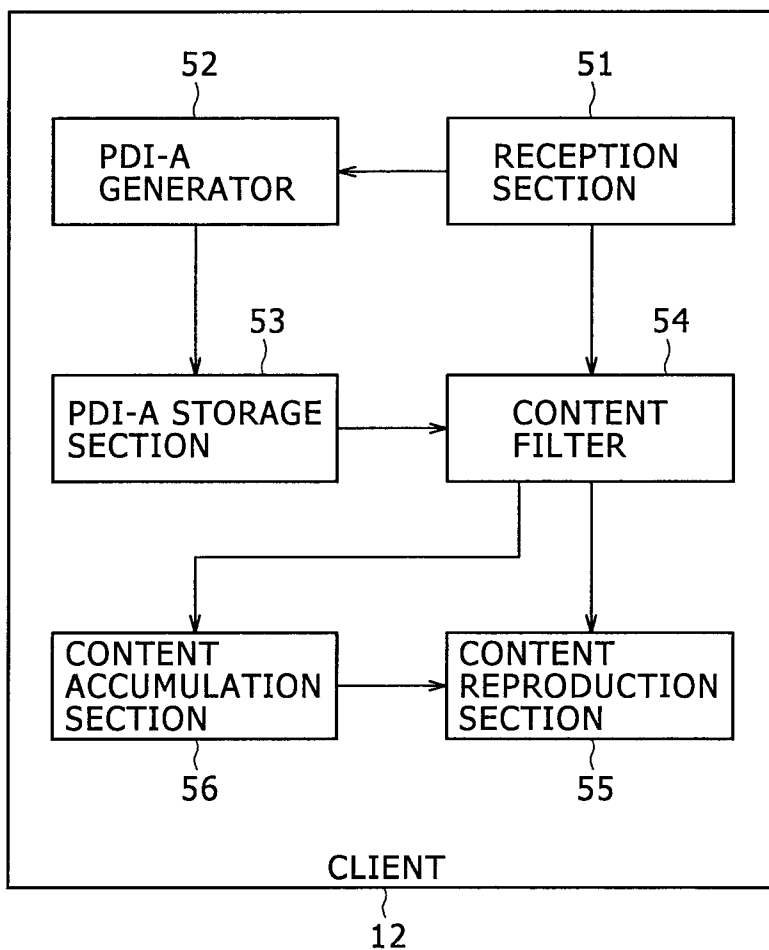
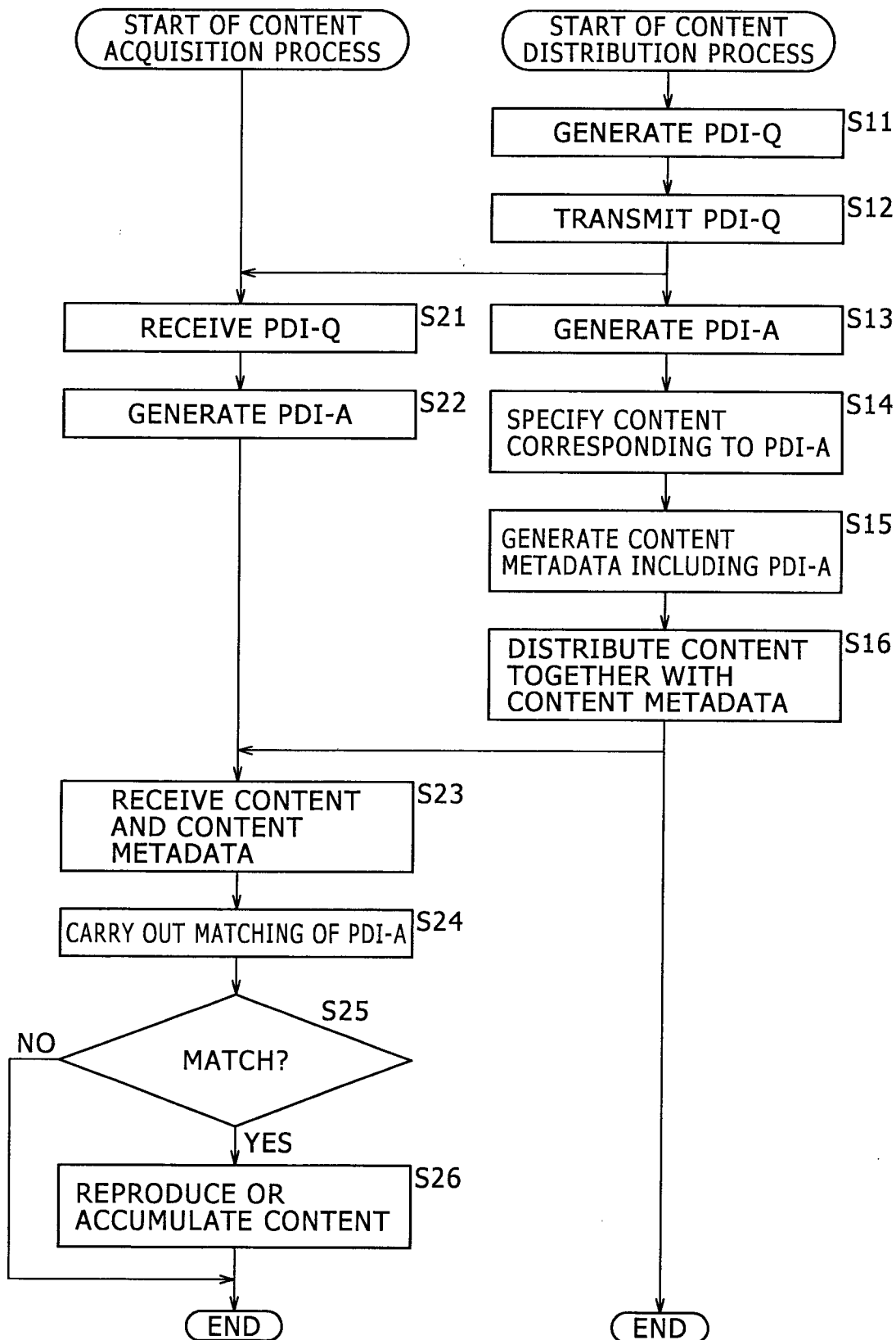


FIG. 4



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FIG. 5



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FIG. 6

```

1: <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified"
attributeFormDefault="unqualified">
2:   <xs:element name="PDITable" type="PDITableType"/>
3:   <xs:complexType name="PDITableType">
4:     <xs:choice maxOccurs="unbounded">
5:       <xs:element name="QIA" type="IntegerAnswerType"/>
6:       <xs:element name="QBA" type="BooleanAnswerType"/>
7:       <xs:element name="QSA" type="SelectionAnswerType"/>
8:       <xs:element name="QTA" type="TextAnswerType"/>
9:       <xs:element name="QAA" type="AnyAnswerType"/>
10:    </xs:choice>
11:    <xs:attribute name="transactional" type="xs:boolean" use="optional"/>
12:  </xs:complexType>
13:  <xs:complexType name="IntegerAnswerType">
14:    <xs:sequence>
15:      <xs:element name="id" type="xs:anyURI"/>
16:      <xs:element name="q" type="xs:string" minOccurs="0"/>
17:      <xs:element name="a" type="xs:integer" minOccurs="0"/>
18:    </xs:sequence>
19:    <xs:attribute name="minInclusive" type="xs:integer" use="optional"/>
20:    <xs:attribute name="maxInclusive" type="xs:integer" use="optional"/>
21:  </xs:complexType>
22:  <xs:complexType name="BooleanAnswerType">
23:    <xs:sequence>
24:      <xs:element name="id" type="xs:anyURI"/>
25:      <xs:element name="q" type="xs:string" minOccurs="0"/>
26:      <xs:element name="a" type="xs:boolean" minOccurs="0"/>
27:    </xs:sequence>
28:  </xs:complexType>
29:  <xs:complexType name="SelectionAnswerType">
30:    <xs:sequence>
31:      <xs:element name="id" type="xs:anyURI"/>
32:      <xs:element name="q" type="xs:string" minOccurs="0"/>
33:      <xs:element name="a" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
34:    </xs:sequence>
35:    <xs:attribute name="minChoice" type="xs:integer" use="optional"/>
36:    <xs:attribute name="maxChoice" type="xs:integer" use="optional"/>
37:  </xs:complexType>
38:  <xs:complexType name="TextAnswerType">
39:    <xs:sequence>
40:      <xs:element name="id" type="xs:anyURI"/>
41:      <xs:element name="q" type="xs:string" minOccurs="0"/>
42:      <xs:element name="a" type="xs:string" minOccurs="0"/>
43:    </xs:sequence>
44:  </xs:complexType>
45: </xs:schema>

```

FIG. 7

```

1: <PDITable transactional="true" >
2:   <QBA>
3:     <id>Common:111</id>
4:     <q>Are you currently employed?</q>
5:   </QBA>
6:   <QIA minInclusive="10" maxInclusive="100">
7:     <id>Common:222</id>
8:     <q>What is the age of the oldest member of the household who watches television?</q>
9:   </QIA>
10:  <QSA minChoice="1" maxChoice="3">
11:    <id>ProviderA:123</id>
12:    <q>In which of the following sports are you most interested? (Multiple selection allowed)</q>
13:    <a>Baseball</a>
14:    <a>Basketball</a>
15:    <a>Soccer</a>
16:    <a>Hockey</a>
17:  </QSA>
18:  <QSA maxChoice="1">
19:    <id>ProviderA:ProgramX:123</id>
20:    <q>Do you enjoy camping and outdoor recreation? (Only one selection)</q>
21:    <a>Never</a>
22:    <a>Occasionally</a>
23:    <a>Frequently</a>
24:  </QSA>
25:  <QTA>
26:    <id>ProviderA:321</id>
27:    <q>Who's products are you most interested in recently? </q>
28:  </QTA>
29: </PDITable>

```


FIG. 8

QUESTION: Are you currently employed? 61

Yes 62-1

No 62-2

PLEASE SELECT EITHER ONE OF CHOICES.

FIG. 9

QUESTION: What is the age of the oldest member of the household who watches television? ~ 71

PLEASE INPUT YOUR AGE.

~ 72

The diagram consists of a large outer rectangle containing two smaller inner rectangles. The top inner rectangle is labeled '71' and contains the text 'QUESTION: What is the age of the oldest member of the household who watches television?'. The bottom inner rectangle is labeled '72' and contains the text 'PLEASE INPUT YOUR AGE.'. A wavy line connects the label '71' to the top-right corner of the question box, and another wavy line connects the label '72' to the top-right corner of the input box.

FIG. 10

QUESTION: In which of the following sports are you most interested? (Multiple selection allowed)	
Baseball	82-1
Basketball	82-2
Soccer	82-3
Hockey	82-4

PLEASE SELECT ONE OR MORE BUT THREE OR LESS OF NEXT CHOICES.

81

FIG. 11

QUESTION: Do you enjoy camping and outdoor recreation?(Only one selection)	91
PLEASE SELECT ONLY ONE OF NEXT CHOICES.	
Never	92-1
Occasionally	92-2
Frequently	93-3

FIG. 12

QUESTION: Who's products are you most interested in recently?

PLEASE DESCRIBE FREELY.

101

102

The figure shows a survey form layout. It consists of a large outer rectangular frame. Inside this frame, at the top, is a smaller rectangular box labeled '101' containing the question 'QUESTION: Who's products are you most interested in recently?'. Below this question box, the text 'PLEASE DESCRIBE FREELY.' is written. To the right of this text is a large, empty rectangular box labeled '102' for providing a response.

FIG. 13

```
1 : <PDitable >
2 :
3 :   <id>Common:111</id>
4 :   <a>>true</a>
5 :
6 :   </QBA>
7 :   <QIA>
8 :     <id>Common:222</id>
9 :     <a>34</a>
10 :
11 :   </QIA>
12 :   <QSA>
13 :     <id>ProviderA:123</id>
14 :     <a>Baseball</a>
15 :     <a>Soccer</a>
16 :     <a>Hockey</a>
17 :
18 :   </QSA>
19 :   <QSA>
20 :     <id>ProviderA:ProgramX:123</id>
21 :     <a>Occasionally</a>
22 :
23 :   </QSA>
24 :   <QTA>
25 :     <id>ProviderA:321</id>
26 :     <a>Somy</a>
27 :
28 :   </QTA>
29 : </PDitable >
```

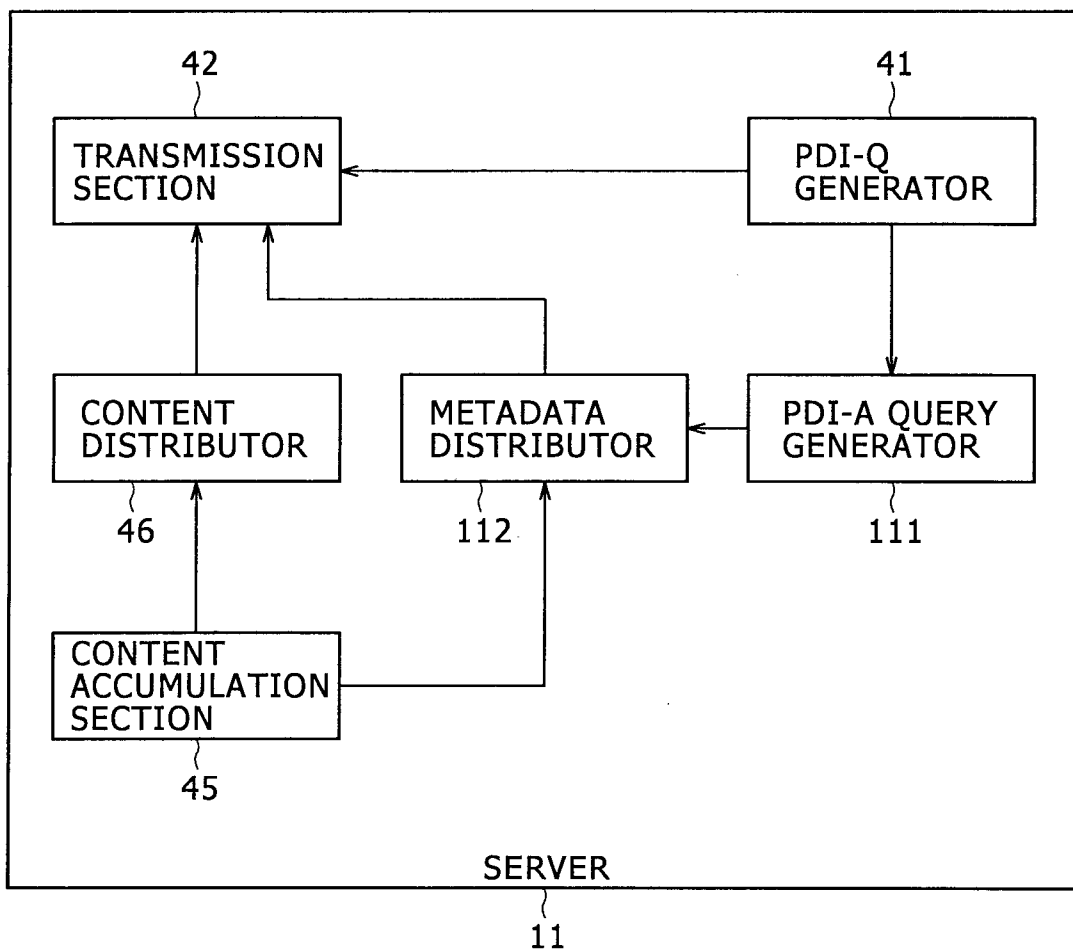
FIG. 14

```
1 : <PDITable>
2 :   <QBA>
3 :     <id>Common:111</id>
4 :     <a>>false</a>
5 :   </QBA>
6 :   <QSA>
7 :     <id>ProviderA:123</id>
8 :     <a>Baseball</a>
9 :   </QSA>
10 :  <QSA>
11 :    <id>ProviderA:ProgramX:123</id>
12 :    <a>Never</a>
13 :  </QSA>
14 : </PDITable>
```

FIG. 15

```
1 : <PDitable>  
2 :   <QSA>  
3 :     <id>ProviderA:123</id>  
4 :     <a>Basketball</a>  
5 :   </QSA>  
6 :   <QSA>  
7 :     <id>ProviderA:ProgramX:123</id>  
8 :     <a>Never</a>  
9 :   </QSA>  
10 : </PDitable>
```


FIG. 16



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FIG. 17

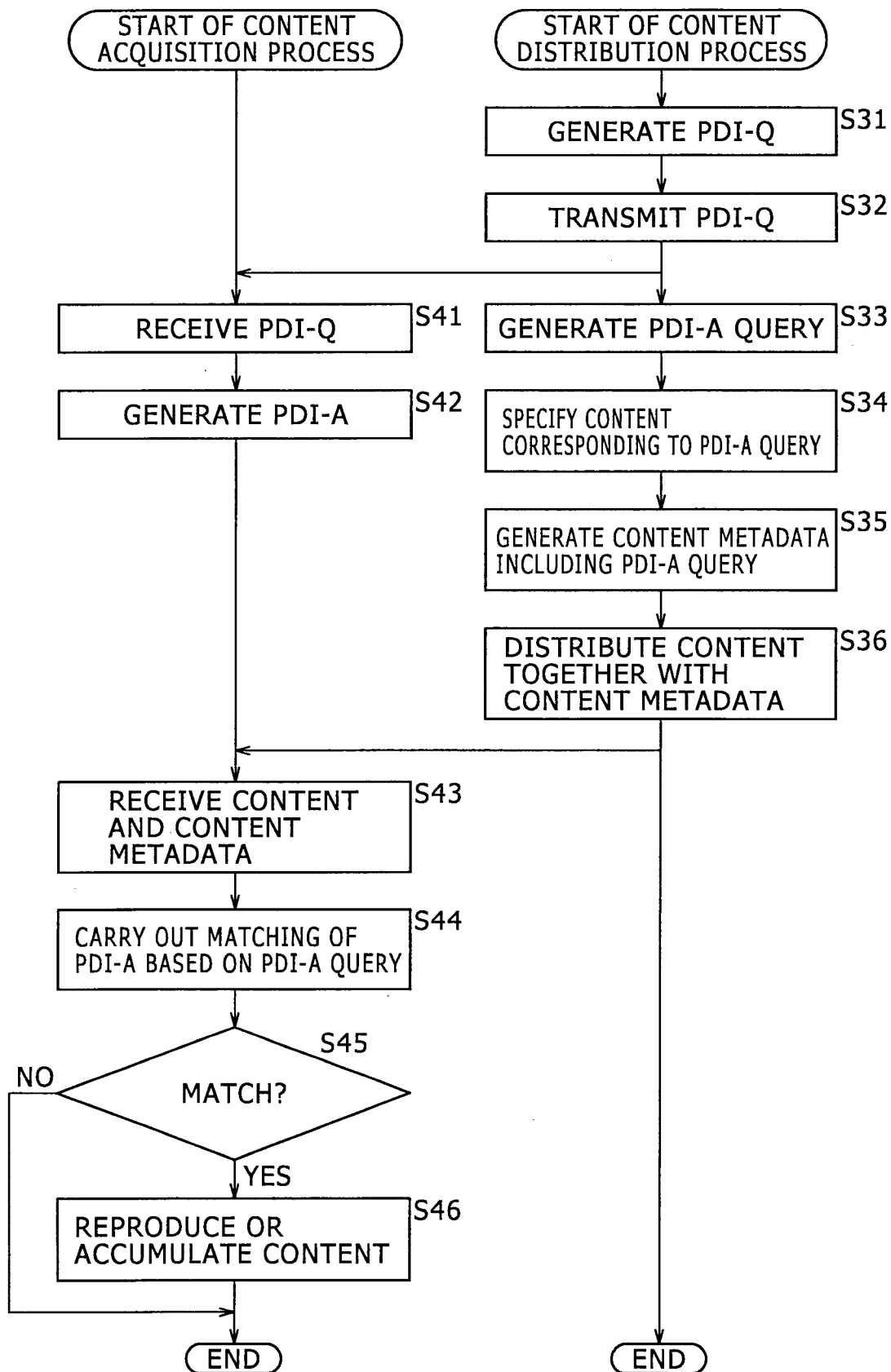


FIG. 18

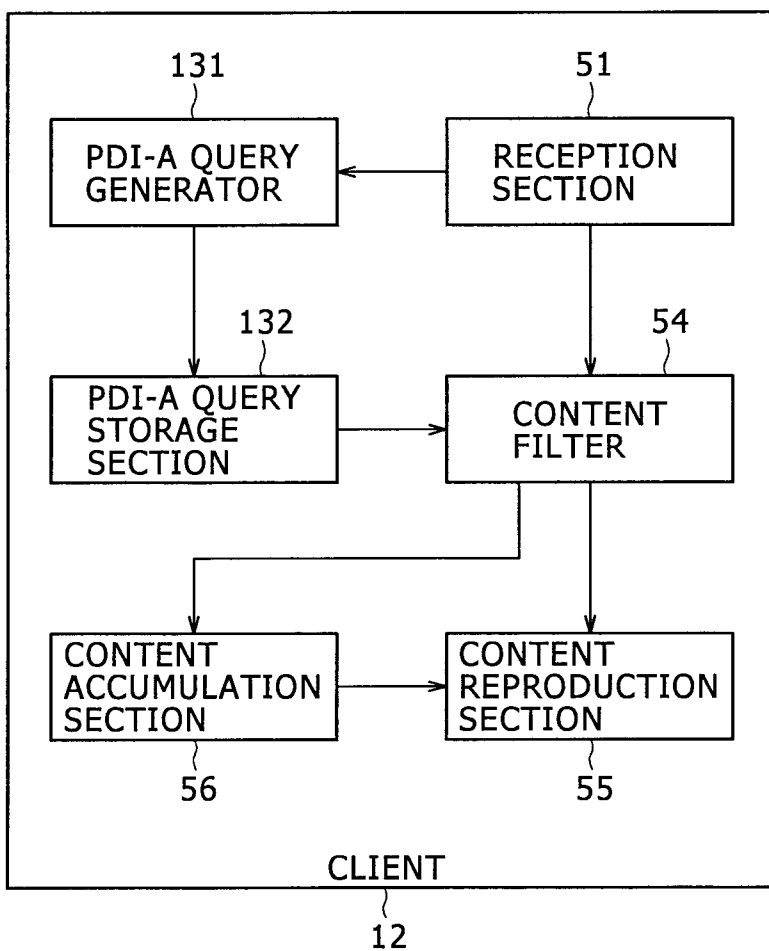


FIG. 19

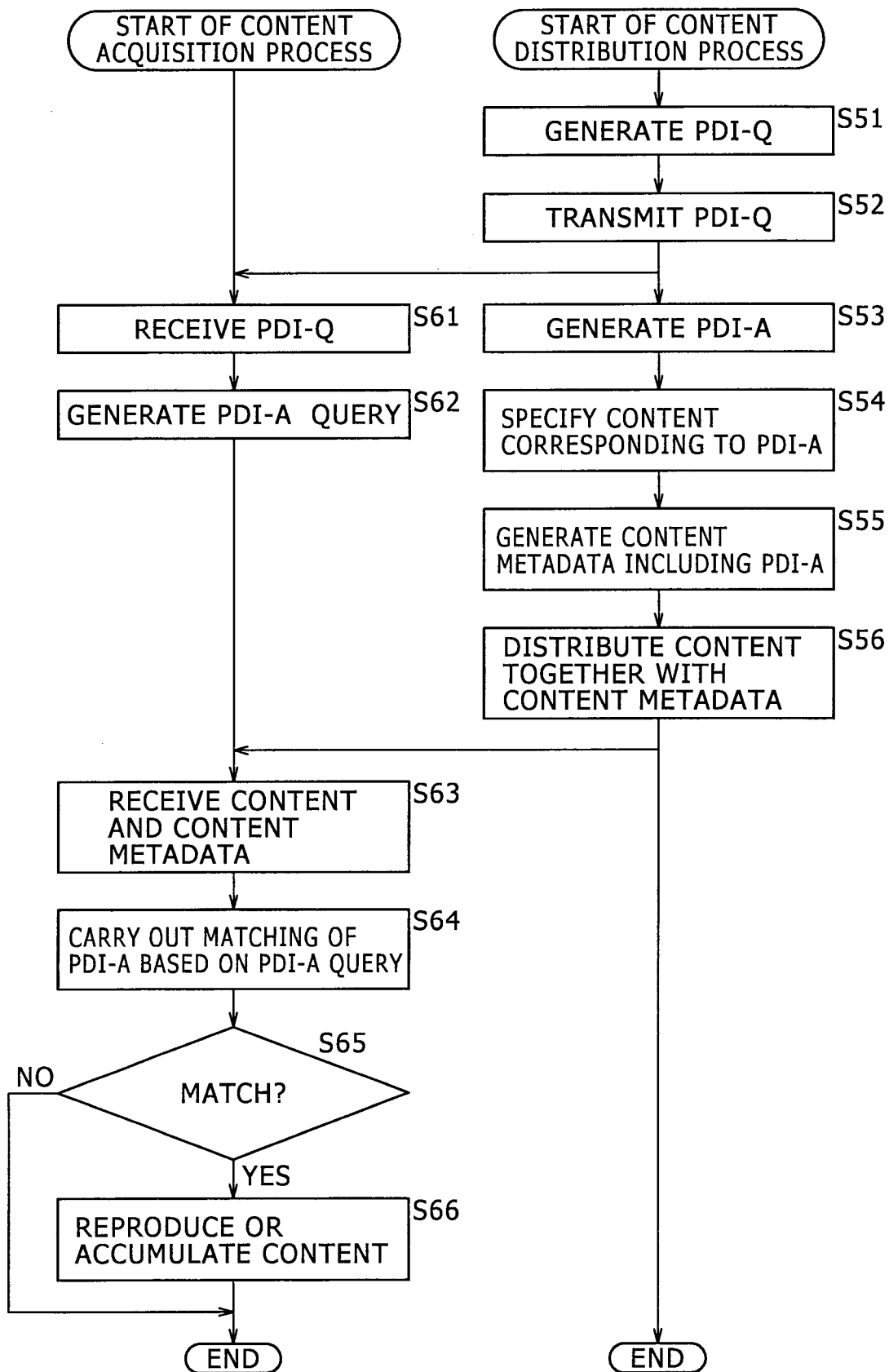


FIG. 20

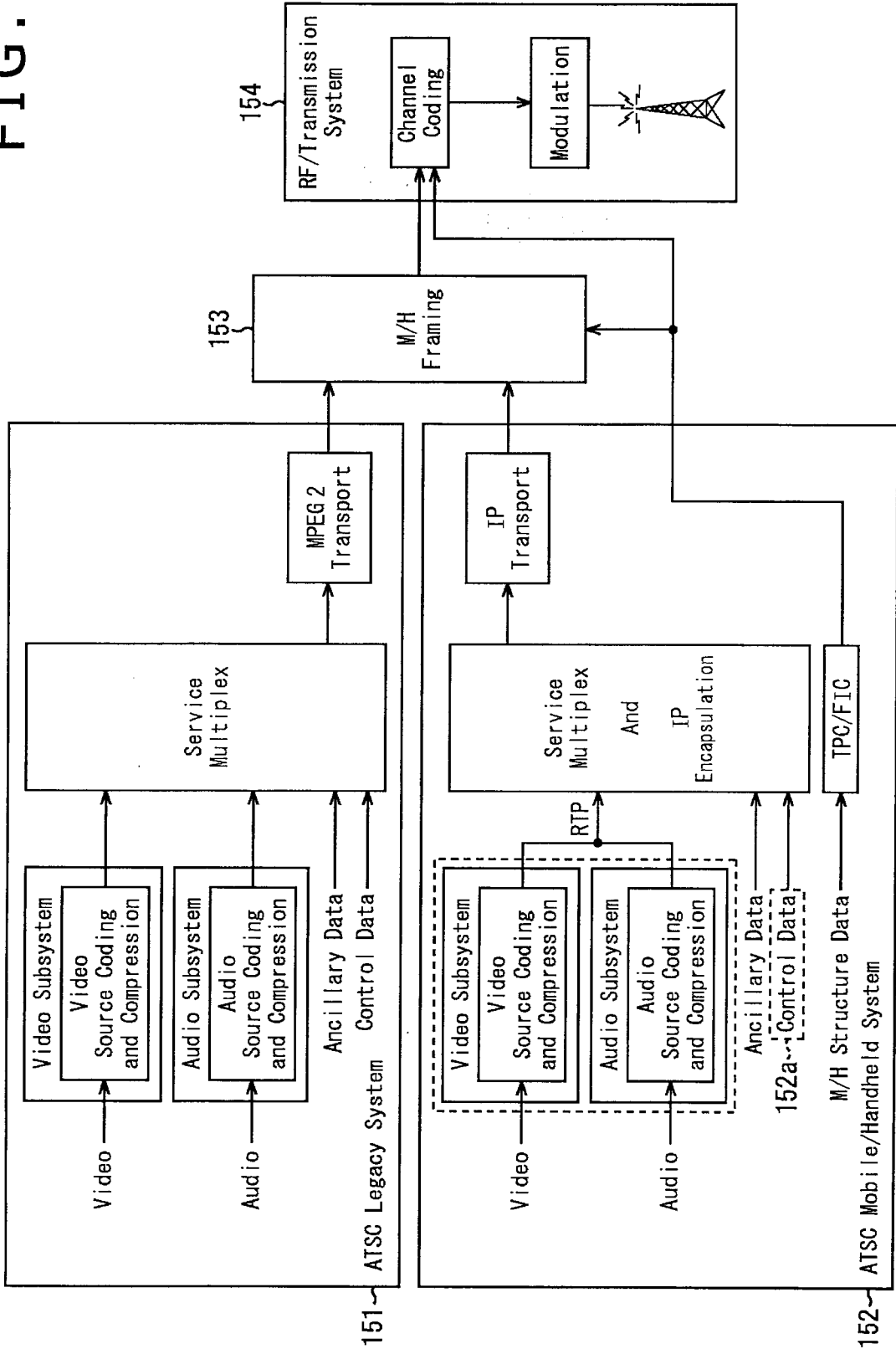
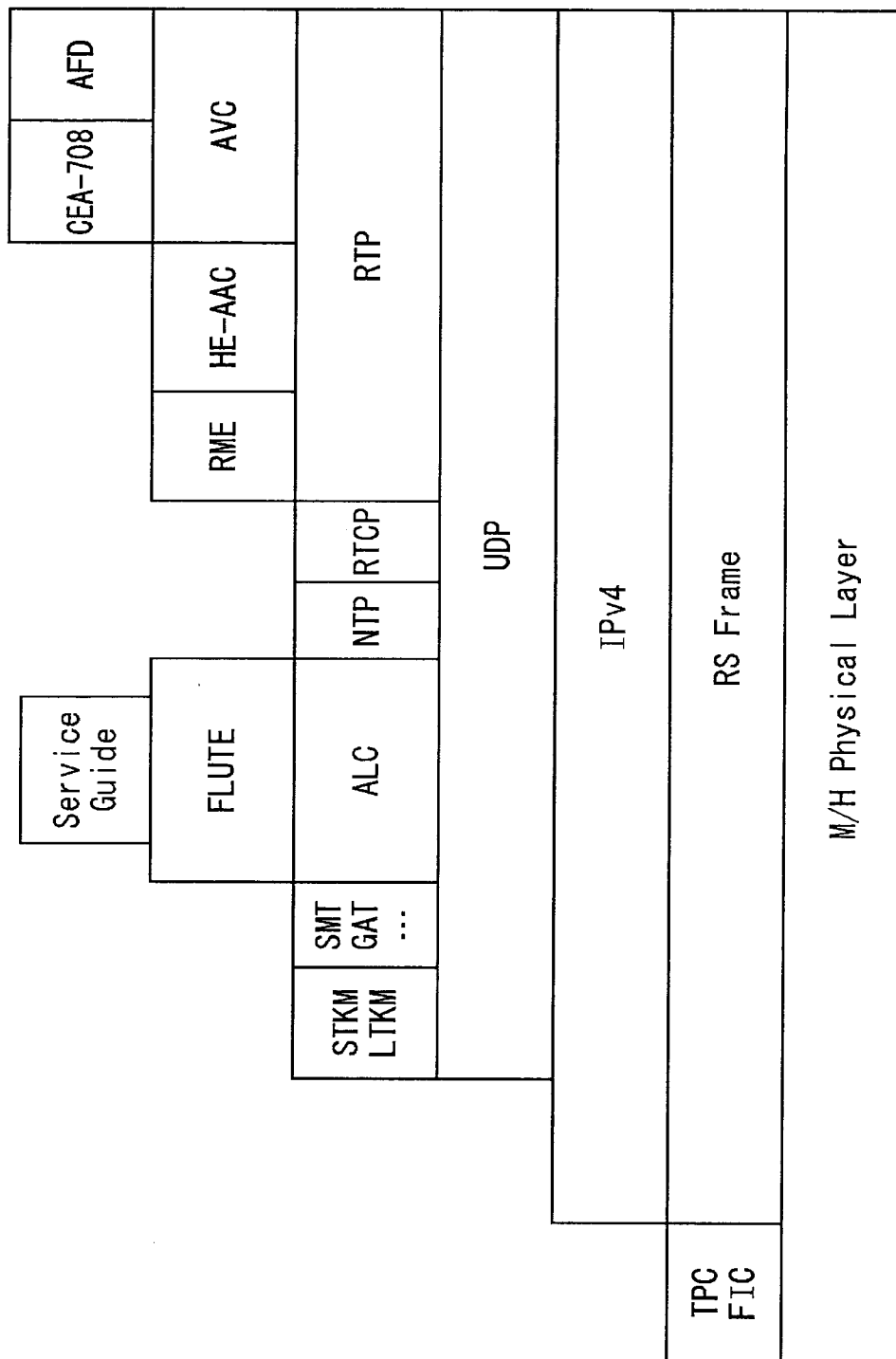


FIG. 21



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FIG. 23

```
Service
  id
  version
  validFrom
  validTo
  globalServiceID
  weight
  baseCID
  ServiceType
  Name
  Description
  AudioLanguage
    languageSDPtag
  TextLanguage
    languageSDPtag
  ParentalRating
    ratingSystem
    ratingValueName
  Genre
  Extension
    url
    Description
  PreviewDataReference
    idRef
    usage
  PrivateExt
    PDI-A
```


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FIG. 24

Schedule

id

version

defaultSchedule

onDemand

validFrom

validTo

ServiceReference

idRef

ContentReference

idRef

contentLocation

PresentationWindow

startTime

endTime

PrivateExt

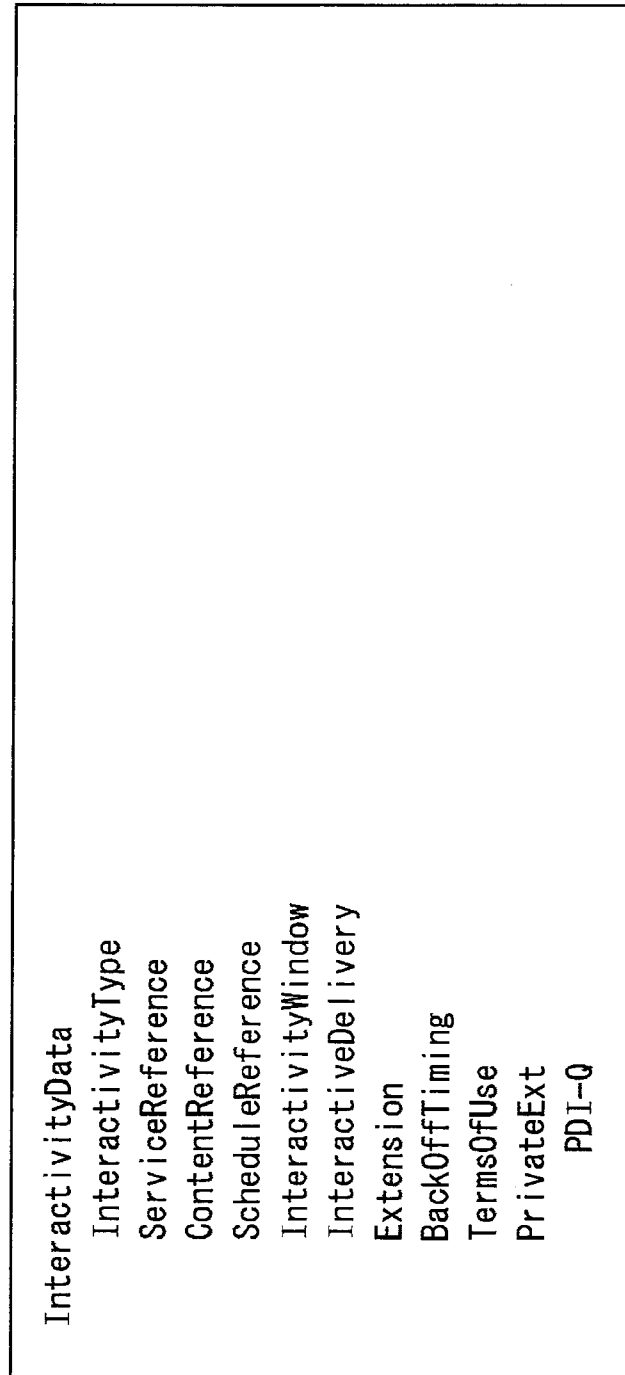
PDI-A

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FIG. 25

Content
 id
 version
 validFrom
 validTo
 globalContentID
 baseCID
 ServiceReference
 idRef
 weight
 Name
 Description
 StartTime
 EndTime
 AudioLanguage
 languageSDPtag
 TextLanguage
 languageSDPtag
 Length
 ParentalRating
 ratingSystem
 ratingValueName
 Genre
 Extension
 url
 Description
 PreviewDataReference
 idRef
 usage
 PrivateExt
 PDI-A

FIG. 26



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FIG. 27

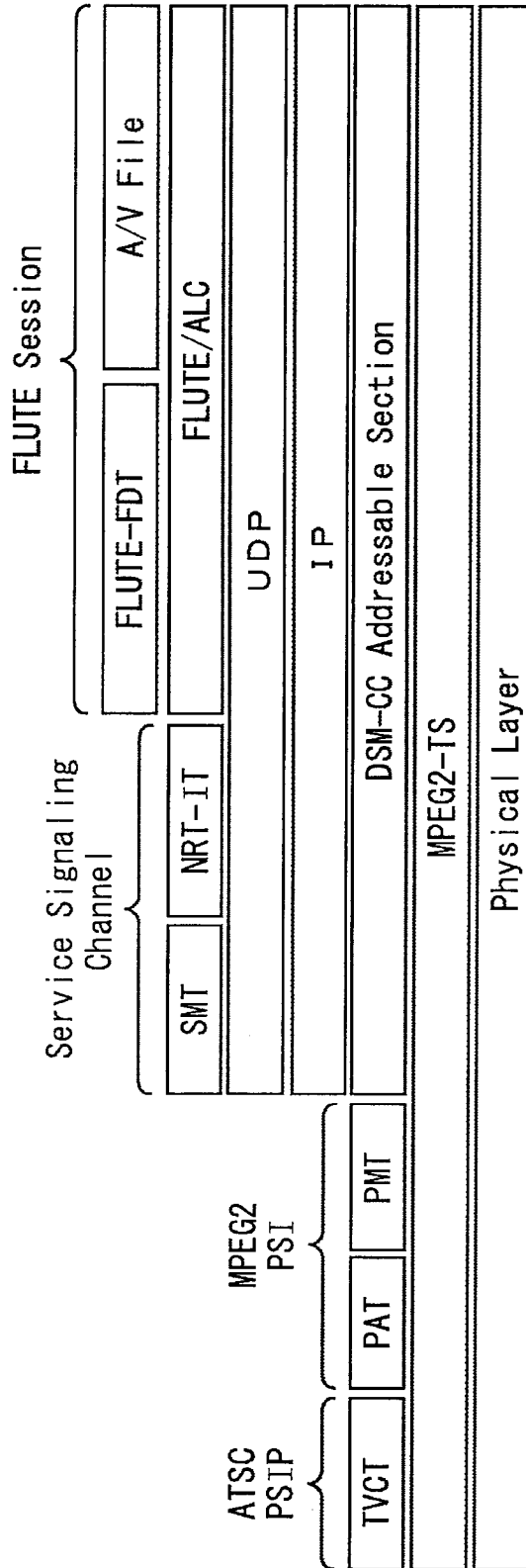


FIG. 28

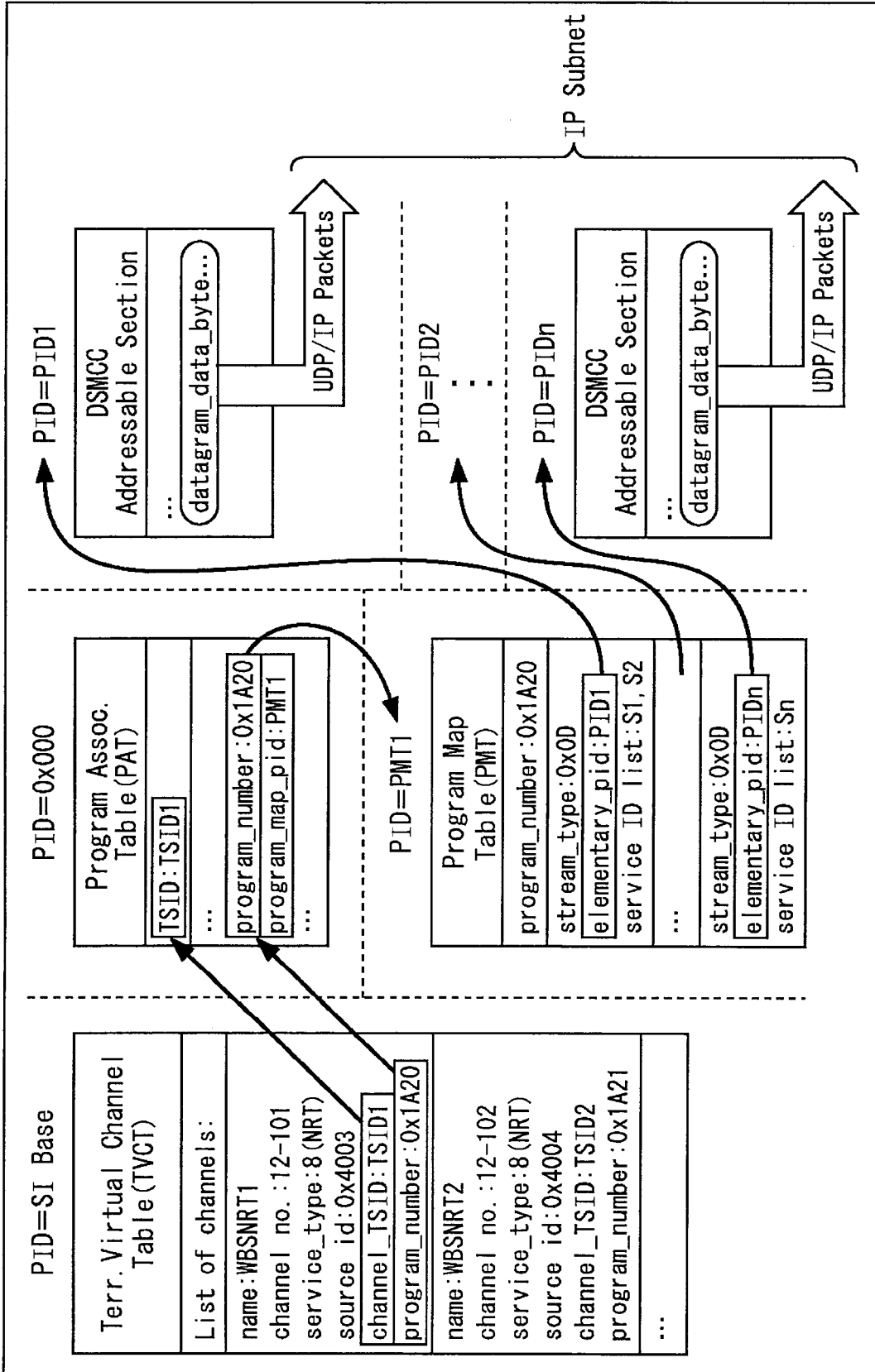


FIG. 29

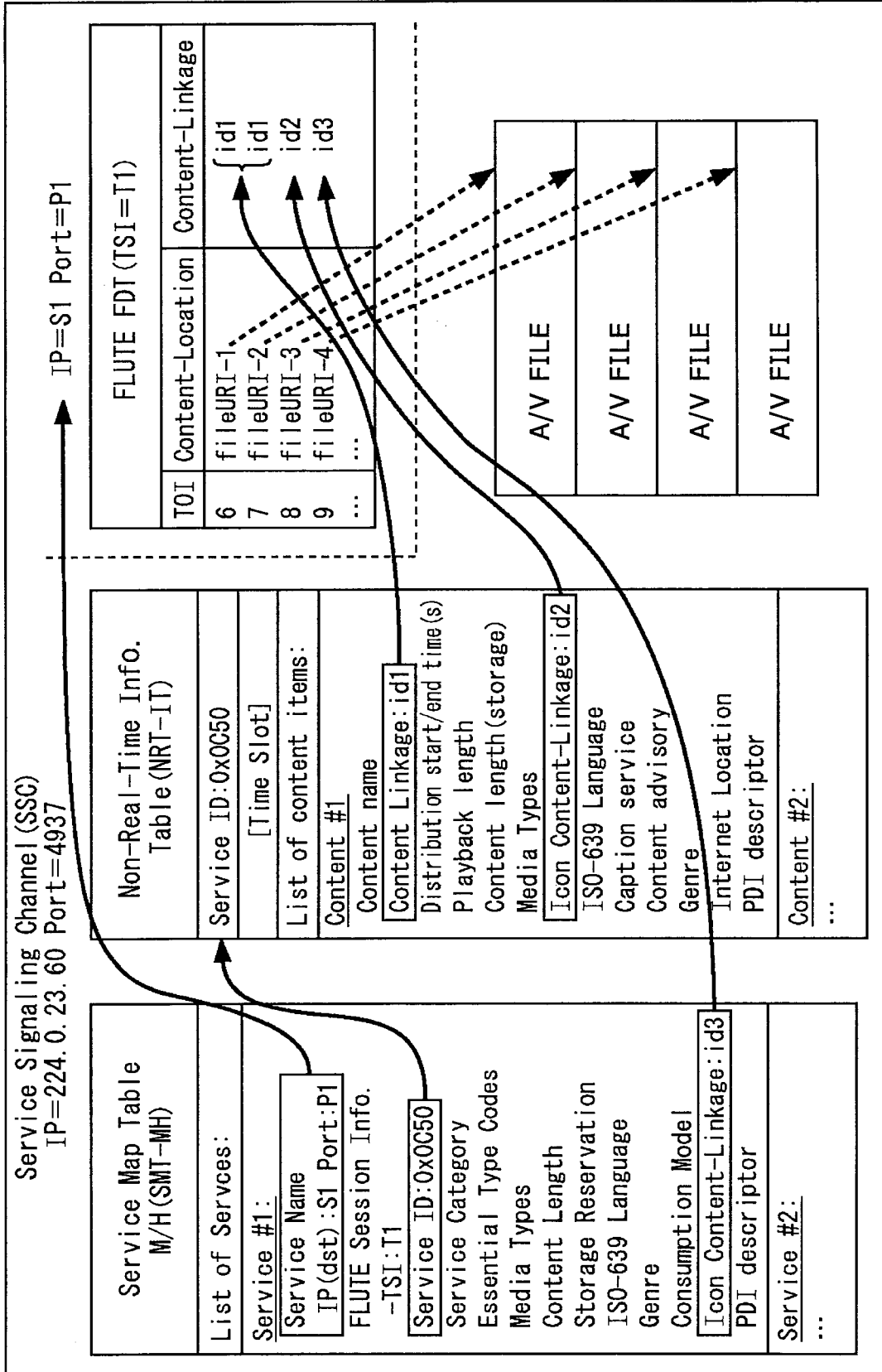


FIG. 30

Syntax	No. of bits	Format
PDI_descriptor () {		
descriptor_tag	8	0x (TBD)
descriptor_length	8	uimbsf
length	8	uimbsf
PDI_Q or PDI_A or PDI_A_Query	var	-
}		

FIG. 31

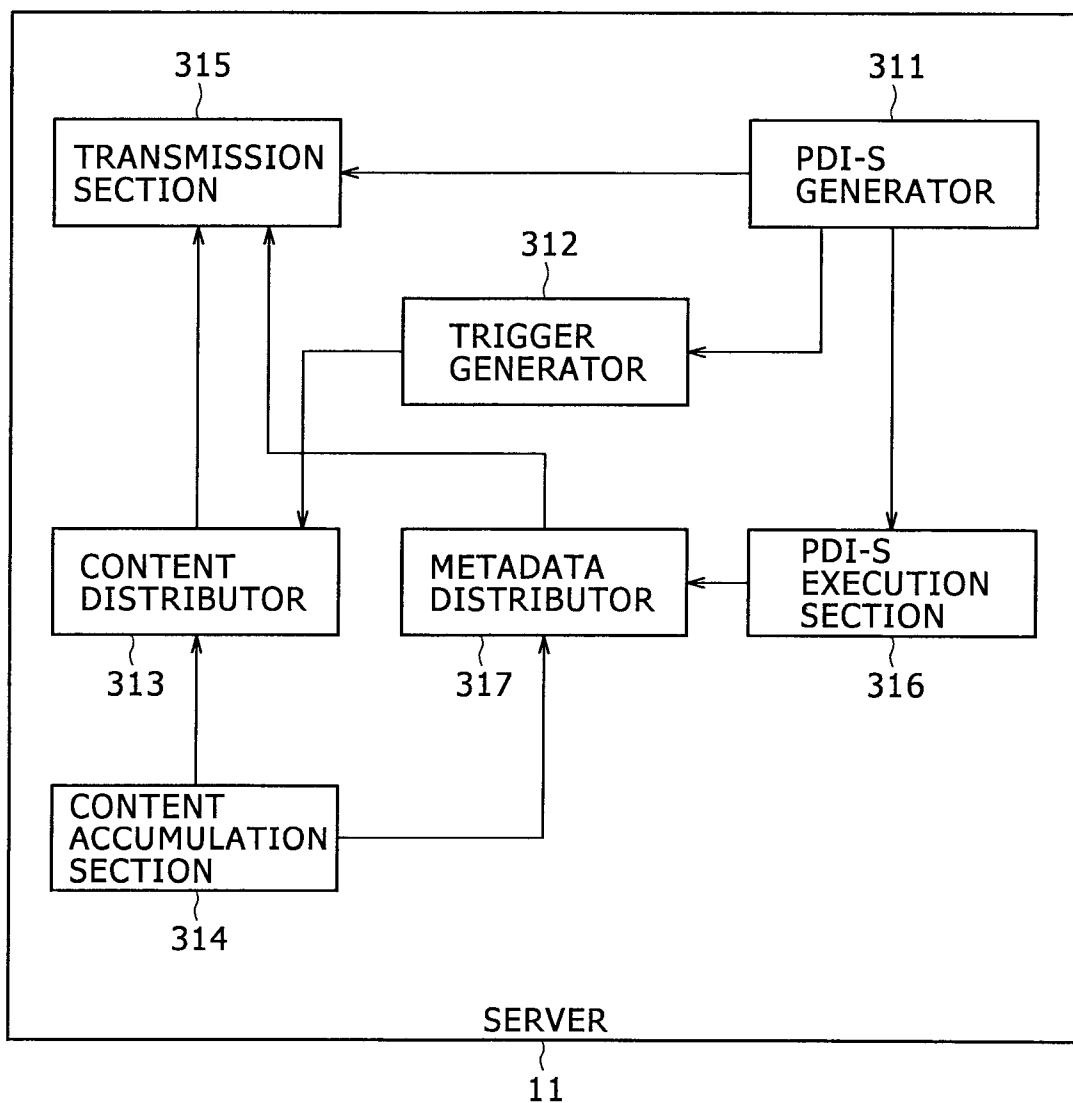


FIG. 32

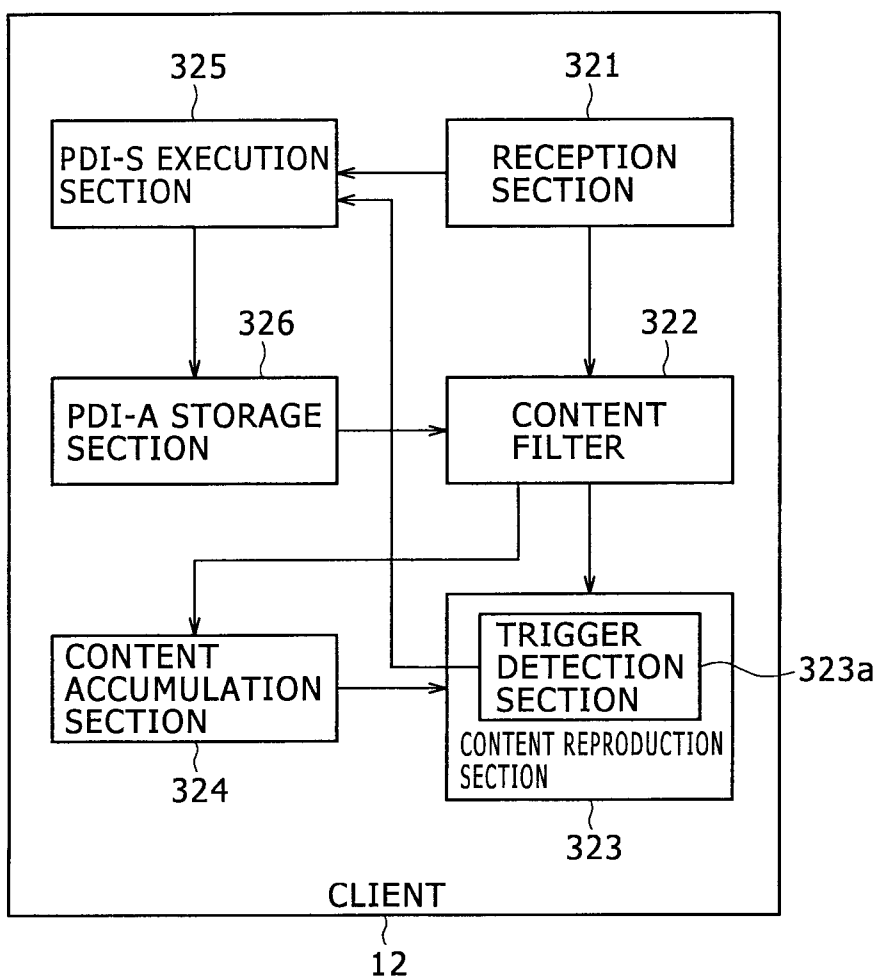
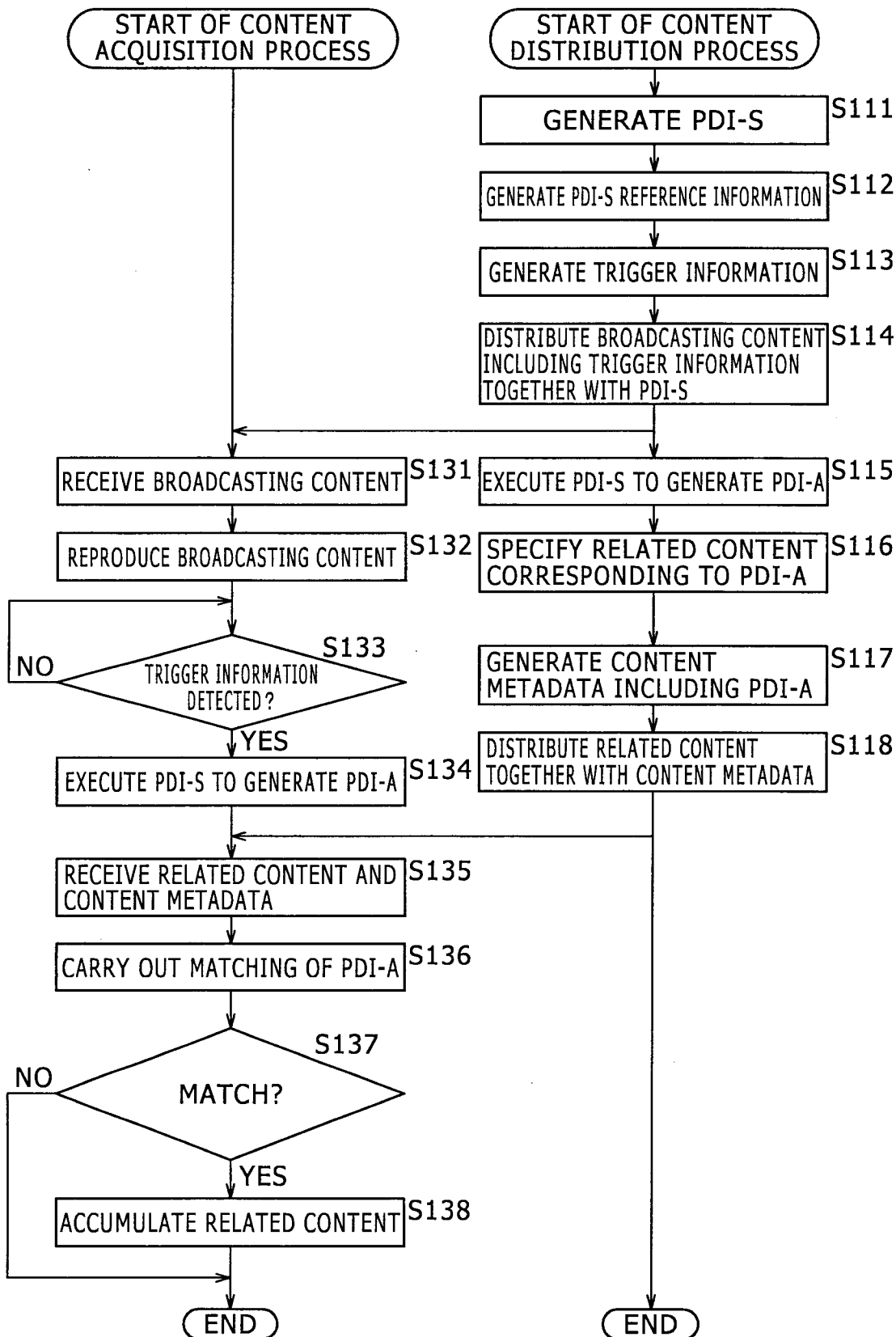


FIG. 33



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FIG. 34

```

1: <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified"
  attributeFormDefault="unqualified">
2:   <xs:element name="PDitable" type="PDitableType"/>
3:   <xs:complexType name="PDitableType">
4:     <xs:choice maxOccurs="unbounded">
5:       <xs:element name="QIA" type="IntegerAnswerType"/>
6:       <xs:element name="QBA" type="BooleanAnswerType"/>
7:       <xs:element name="QSA" type="SelectionAnswerType"/>
8:       <xs:element name="QTA" type="TextAnswerType"/>
9:       <xs:element name="QAA" type="AnyAnswerType"/>
10:    </xs:choice>
11:    <xs:attribute name="transactional" type="xs:boolean" use="optional"/>
12:  </xs:complexType>
13:  <xs:complexType name="IntegerAnswerType">
14:    <xs:sequence>
15:      <xs:element name="id" type="xs:anyURI"/>
16:      <xs:element name="q" type="xs:string" minOccurs="0"/>
17:      <xs:element name="a" type="xs:integer" minOccurs="0"/>
18:    </xs:sequence>
19:    <xs:attribute name="minInclusive" type="xs:integer" use="optional"/>
20:    <xs:attribute name="maxInclusive" type="xs:integer" use="optional"/>
21:  </xs:complexType>
22:  <xs:complexType name="BooleanAnswerType">
23:    <xs:sequence>
24:      <xs:element name="id" type="xs:anyURI"/>
25:      <xs:element name="q" type="xs:string" minOccurs="0"/>
26:      <xs:element name="a" type="xs:boolean" minOccurs="0"/>
27:    </xs:sequence>
28:  </xs:complexType>
29:  <xs:complexType name="SelectionAnswerType">
30:    <xs:sequence>
31:      <xs:element name="id" type="xs:anyURI"/>
32:      <xs:element name="q" type="xs:string" minOccurs="0"/>
33:      <xs:element name="a" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
34:    </xs:sequence>
35:    <xs:attribute name="minChoice" type="xs:integer" use="optional"/>
36:    <xs:attribute name="maxChoice" type="xs:integer" use="optional"/>
37:  </xs:complexType>
38:  <xs:complexType name="TextAnswerType">
39:    <xs:sequence>
40:      <xs:element name="id" type="xs:anyURI"/>
41:      <xs:element name="q" type="xs:string" minOccurs="0"/>
42:      <xs:element name="a" type="xs:string" minOccurs="0"/>
43:    </xs:sequence>
44:  </xs:complexType>
45:  <xs:complexType name="AnyAnswerType">
46:    <xs:sequence>
47:      <xs:element name="id" type="xs:anyURI"/>
48:      <xs:element name="a" type="xs:base64Binary"/>
49:    </xs:sequence>
50:  </xs:complexType>
51: </xs:schema>

```

FIG. 35

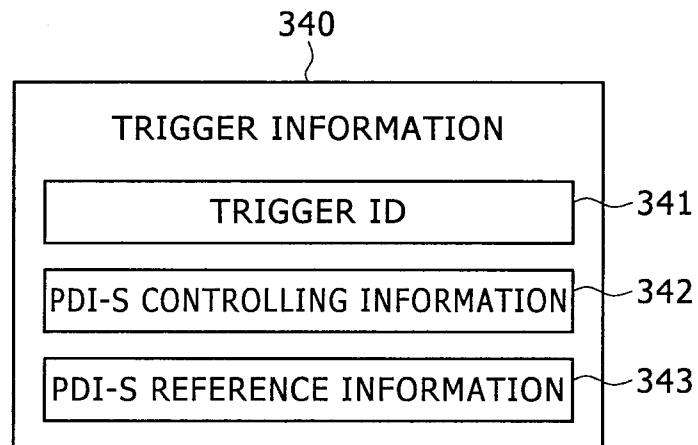


FIG. 36

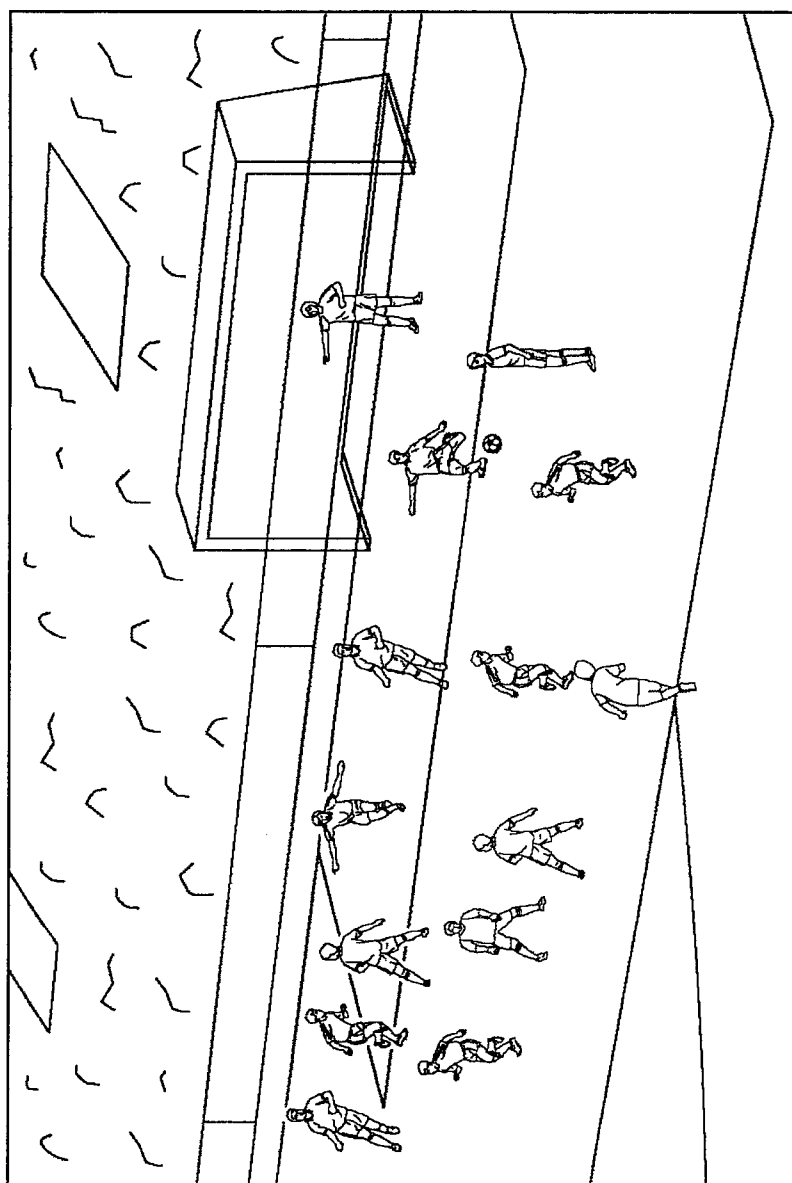
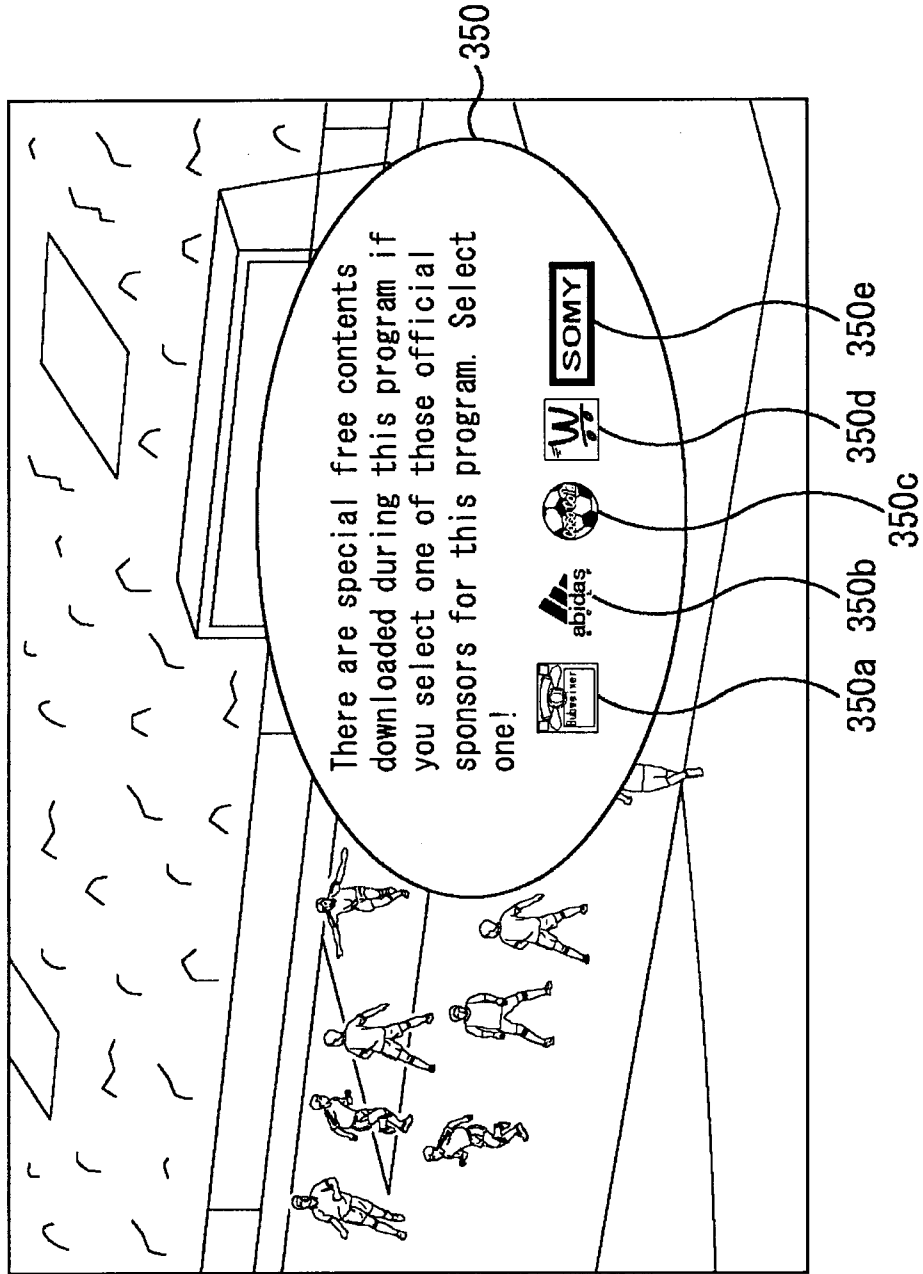


FIG. 37



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FIG. 38

```
1 : <PDitable>
2 :   <QSA>
3 :     <id>ProviderA:ProgramX:123</id>
4 :     <a>Somy</a>
5 :   </QSA>
6 : </PDitable>
```

FIG. 39

```
1 : <PDitable>
2 :   <QAA>
3 :     <id>ProviderA:ProgramX:0000123</id>
4 :     <a>WU5PUw==</a>
5 :   </QAA>
6 : </PDitable>
```

FIG. 40

```
1 : <PDitable>
2 :   <QSA>
3 :     <id>ProviderA:ProgramX:123</id>
4 :     <a>Somy</a>
5 :   </QSA>
6 : </PDitable>
```

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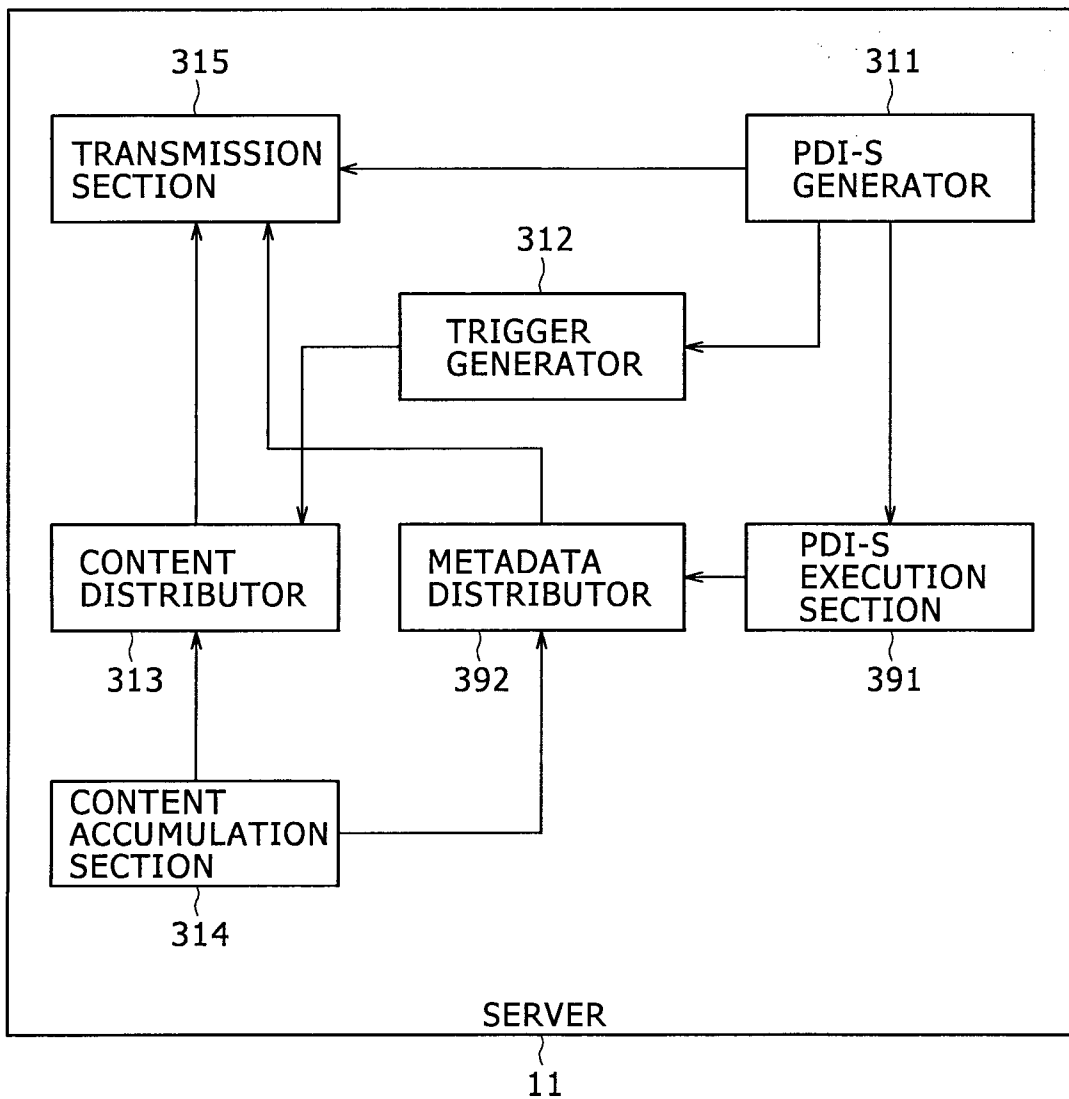
FIG. 41

```
1 : <PDitable>
2 :     <QAA>
3 :         <id>ProviderA:ProgramX:0000123</id>
4 :         <a>WU5PUw==</a>
5 :     </QAA>
6 : </PDitable>
```

FIG. 42

```
1 : <PDitable>
2 :     <QAA>
3 :         <id>ProviderA:ProgramX:0000123</id>
4 :         <a>UGFuYXNvbmlj</a>
5 :     </QAA>
6 : </PDitable>
```


FIG. 43



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FIG. 44

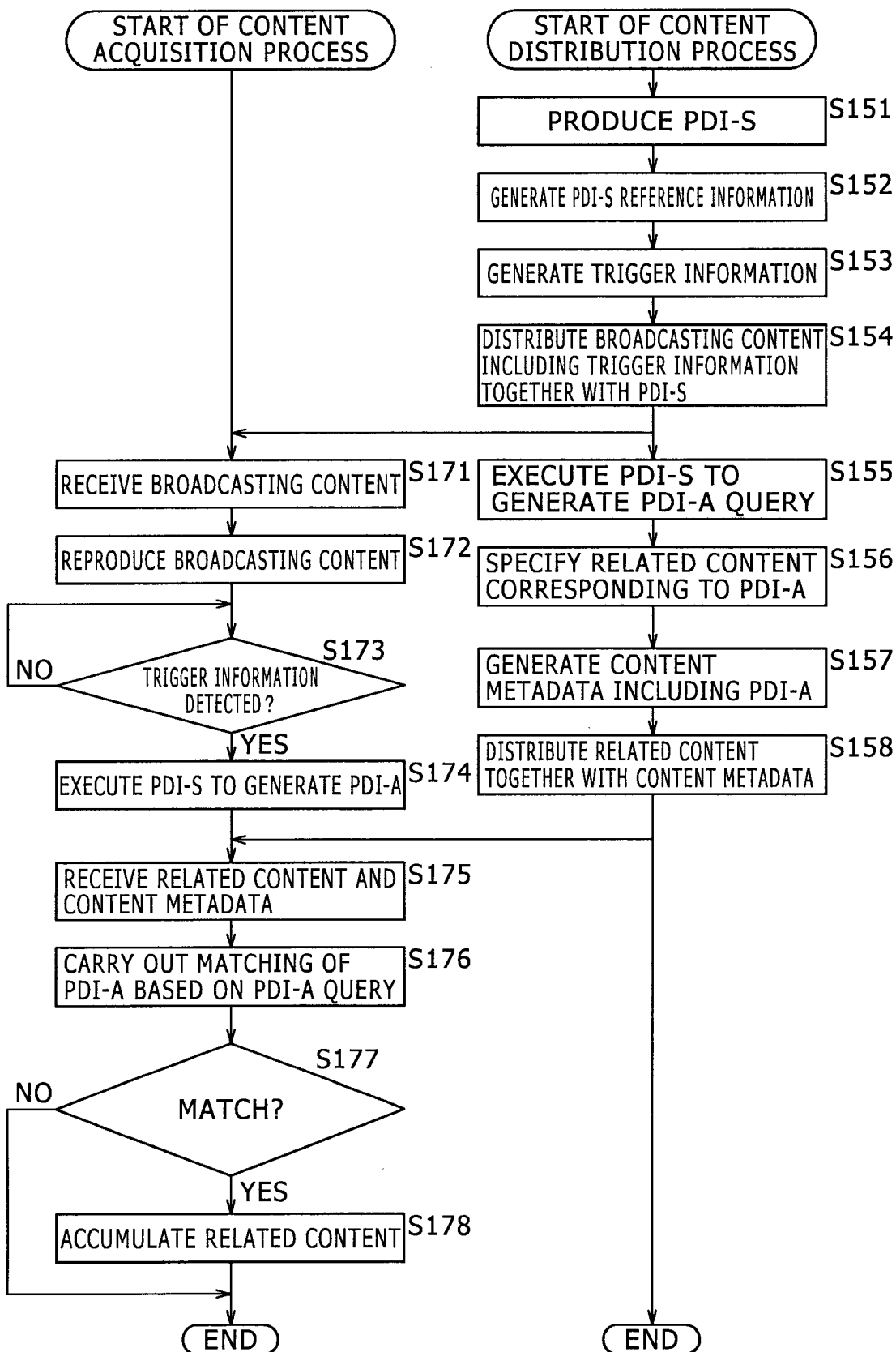
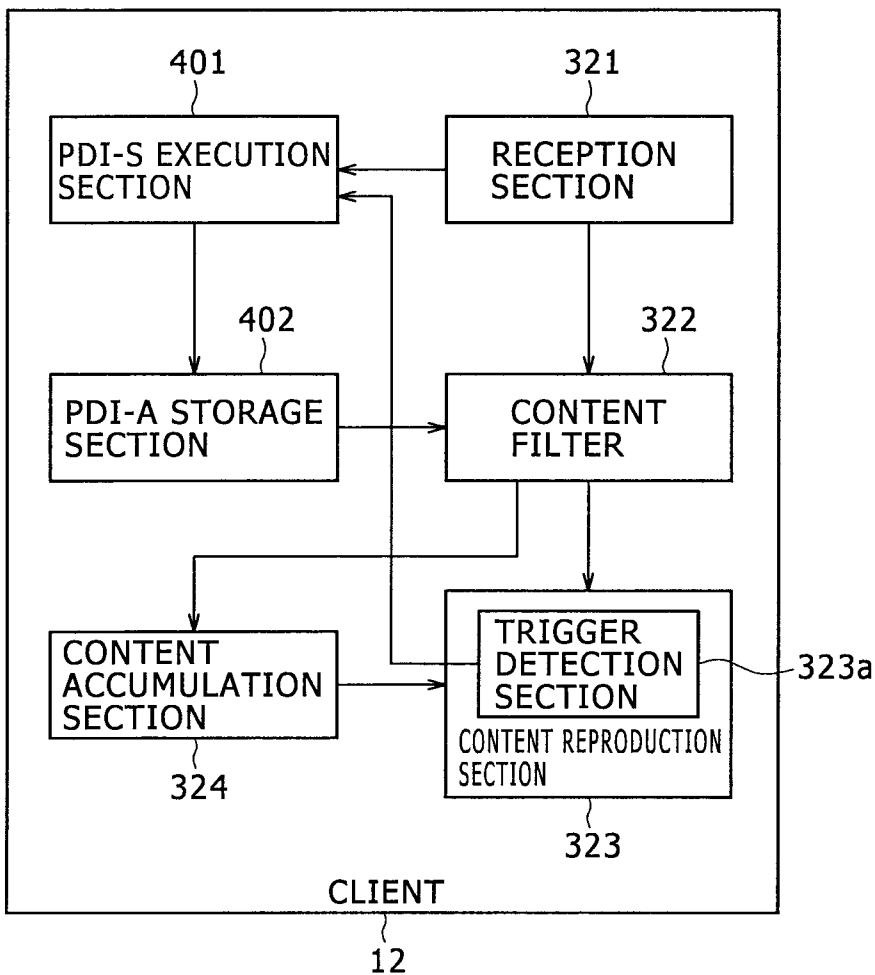


FIG. 45



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FIG. 46

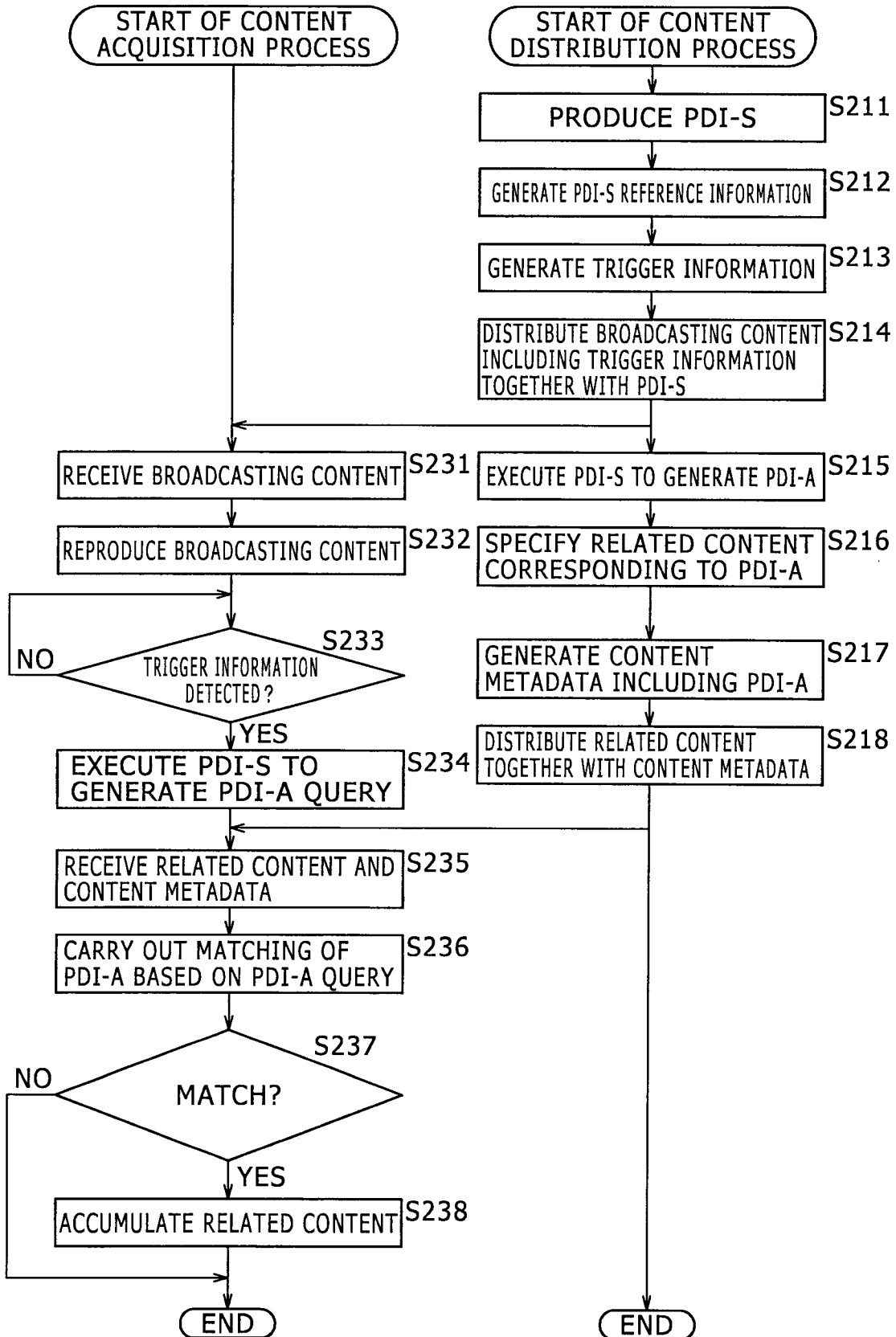


FIG. 47

1:	InteractivityData
2:	InteractivityType
3:	ServiceReference
4:	ContentReference
5:	ScheduleReference
6:	InteractivityWindow
7:	InteractiveDelivery
8:	Extension
9:	BackOffTiming
10:	TermsOfUse
11:	PrivateExt
12:	PDI-S

FIG. 48

Syntax	No. of bits	Format
PDI_descriptor() {		
descriptor_tag	8	0x (TBD)
descriptor_length	8	uimbf
length	8	uimbf
PDI_S or PDI_A or PDI_A_Query	var	-
}		



↑
10