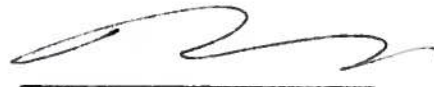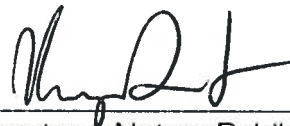I, Kayoko Imori, hereby certify that the attached Japanese to English translation has been translated by a qualified translator competent in both languages, and verified to be an accurate and complete rendering of the content of the original document to the best of our ability. The following documents are included on this certification.

Japanese Unexamined Patent Application No. H11-7453

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RYAN ALEXANDER DROST
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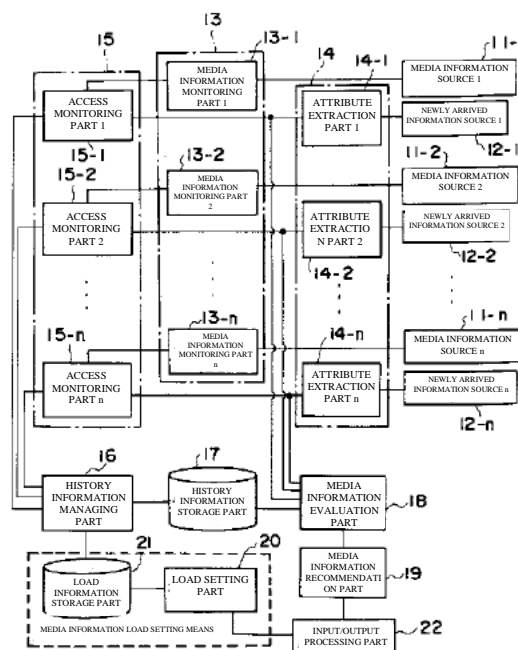| (51) Int. Cl.⁶	Identification codes	FI	
G06F 17/30		G06F 15/40	370 G
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(22) Date of application	March 17, 1998	(72) Inventor	Akira Kotani % Mitsubishi Electric Corporation 2-2-3 Marunouchi, Chiyoda-ku, Tokyo-to
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(33) Priority country	Japan (JP)		

(54) (Title of the invention) MEDIA INFORMATION RECOMMENDATION DEVICE

(57) (Abstract)

(Problem) To recommend information that coincides with a user's preferences with high reliability by collectively managing an access history for a plurality of media information sources and more accurately evaluating the user's degree of attention to the media information.

(Means for solving) The media information recommendation device comprises: respective attribute extraction parts 14 for automatically extracting keywords or the like from newly arrived information from newly arrived information sources 12 and creating attribute information; respective access monitoring parts 15 for creating monitoring information based on attribute information corresponding to media information accessed by a user; a history information managing part 16 for updating history information with reference to a load value set for each media information source by a load information setting part 20 based on monitoring information of the same format, regardless of the type of media information; and a media information evaluation part 18 for evaluating attribute information related to newly arrived information sent as a result of a comparison with the history information and displaying recommendation information; wherein information is recommended based on the user's degree of attention to each piece of media information calculated based on the access history to a plurality of media information sources.

(SCOPE OF THE PATENT CLAIMS)

(CLAIM 1) A media information recommendation device for estimating a user's preferences based on the user's history of accessing a plurality of media information sources in the past and recommending information coinciding with a user's preferences from among newly arrived information sent from a newly arrived information source, the device comprising:

an attribute extraction means for extracting and outputting attribute information from the newly arrived information;

an access monitoring means for monitoring the status of the user's access to each of the media information sources and outputting monitoring information related to media information accessed by the user based on the attribute information;

a history information storage means for storing history information for the user's access to the plurality of media information sources;

a history information managing means for updating the history information based on the monitoring information outputted by the access monitoring means; and

a media information evaluation means for evaluating whether the newly arrived information coincides with the user's preferences by comparing the attribute information outputted by each attribute extraction means and the history information stored in the history information storage means;

wherein history information based on the user's access to the plurality of media information sources is collectively managed, and information is recommended based on the history information.

(CLAIM 2) The media information recommendation device according to Claim 1, wherein a plurality of access monitoring means are provided so as to correspond to each of the media information sources.

(CLAIM 3) The media information recommendation device according to Claim 1, wherein a plurality of attribute extraction means are provided so as to correspond to each newly arrived information source when there are a plurality of newly arrived information sources.

(CLAIM 4) The media information recommendation device according to Claim 1, wherein the attribute extraction means automatically extracts keywords expressing the content of the newly arrived information or special notes from the newly arrived information.

(CLAIM 5) The media information recommendation device according to Claim 1, wherein the attribute extraction means automatically extracts genre information specifying the genre from the newly arrived information.

(CLAIM 6) The media information recommendation device according to Claim 2, wherein the access monitoring means outputs all monitoring information of the same format.

(CLAIM 7) The media information recommendation device according to Claim 3, wherein the attribute extraction means outputs all attribute information of the same format.

(CLAIM 8) The media information recommendation device according to Claim 1 having a media information source load setting means for setting a load value for each media information source;

wherein the history information managing means updates the history information by assigning a load to the monitoring information sent from the access monitoring means based on the load value.

(CLAIM 9) The media information recommendation device according to Claim 1, wherein when a television broadcasting information source which outputs a television broadcasting signal using radio waves or cables is at least one of the media sources and a program information source which outputs program information related to programs scheduled to be broadcast is the newly arrived information source,

the attribute extraction means has a program attribute extraction part for extracting and outputting program attribute information from the program information; and

the access monitoring means has a program viewing monitoring part which, when the user views a program, outputs program monitoring information based on the program attribute information of that program.

(CLAIM 10) The media information recommendation device according to Claim 1, wherein an electronic news information source which outputs article information containing electronic news is at least one of the media information sources and the newly arrived information source,

the attribute extraction means has an article attribute extraction means for extracting and outputting article attribute information from the article information; and

the access monitoring means has an article reading monitoring part which, when the user reads electronic news, outputs article monitoring information based on the article attribute information of that article.

(CLAIM 11) The media information recommendation device according to Claim 1, wherein a network information source which outputs page information is at least one of the media information sources and the newly arrived information source,

the attribute extraction means has a page attribute extraction part for extracting and outputting page attribute information from the page information; and

the access monitoring means has a page access monitoring part which, when the user reads page information, outputs page monitoring information based on the page attribute information of that page information.

(CLAIM 12) A media information recommendation device comprising:

an operation input means for receiving an input operation by a user;

an information output means for outputting media information from a media information source selected by the user via the operation input means from among a plurality of media information sources;

an information attention level evaluation means for evaluating an information attention level expressing the user's degree of attention to media information based on the user's behavior while the information output means is outputting the media information; and

a media information recommendation means for recommending media information coinciding with the user's preferences from among newly arrived information that is sent based on the information attention level.

(CLAIM 13) A media information recommendation device comprising:

an operation input means for receiving an input operation by a user;

an information output means for outputting media information from a channel selected by the user via the operation input means from among media information sources having a plurality of channels;

an information attention level evaluation means for evaluating an information attention level expressing the user's degree of

attention to media information based user's behavior while the information output means is outputting the media information; and

a media information recommendation means for recommending media information coinciding with the user's preferences from among newly arrived information that is sent based on the information attention level.

(CLAIM 14) The media information recommendation device according to Claim 13, wherein the information attention level evaluation means evaluates the information attention level for each program when the media information source provides each program that is broadcast in accordance with a broadcast schedule as each piece of media information via each channel; and

the media information recommendation means recommends a program.

(CLAIM 15) The media information recommendation device according to Claim 14, wherein the information attention level evaluation means evaluates the information attention level of each program by referencing the amount of time elapsed from when the user selects a channel broadcasting the program until the broadcast of the program is begun.

(CLAIM 16) The media information recommendation device according to Claim 12 or 13, wherein the information attention level evaluation means evaluates the information attention level based on the operation frequency by the user from the operation input means.

(CLAIM 17) The media information recommendation device according to Claim 16, wherein the information output means enables the output of information or some information by means of sound; and

the information attention level evaluation means evaluates the information attention level based on a volume adjustment operation frequency.

(CLAIM 18) The media information recommendation device according to Claim 16, wherein the information attention level evaluation means evaluates the information attention level based on a channel operation frequency.

(CLAIM 19) The media information recommendation device according to Claim 12 or 13 having a distance measurement means for measuring a distance between the user and the information output means;

wherein the information attention level evaluation means evaluates the information attention level based on the measurement value determined by the distance measurement means.

(CLAIM 20) The media information recommendation device according to Claim 12 or 13, wherein the information output means enables the output of information or some information by means of sound; and

the information attention level evaluation means evaluates the information attention level based on a volume corresponding to an adjustment operation by the user from the operation input means.

(CLAIM 21) The media information recommendation device according to Claim 14, wherein the information attention level evaluation means evaluates the information attention level based on a degree of coincidence between the time slot during which the information output means outputs a program based on a channel selection operation by the user from the operation input means and the broadcast time slot of the program based on the broadcast schedule.

(CLAIM 22) The media information recommendation device according to Claim 12 or 13 having an index value holding means in which, when the information attention level evaluation

means indicates the information attention level as an evaluation value, an index value used to obtain the evaluation value is set in advance.

(CLAIM 23) The media information recommendation device according to Claim 12 or 13, wherein the information attention level evaluation means indicates the information attention level with an evaluation value determined by a prescribed function.

(DETAILED DESCRIPTION OF THE INVENTION)

(0001)

(TECHNICAL FIELD OF THE INVENTION) The present invention relates to a media information recommendation device for recommending newly arrived media information and more particularly to the improvement of the reliability of estimating a user's preferences.

(0002)

(PRIOR ART) Devices which estimate a user's preferences based on the user's past access history of media information and recommend newly arrived media information to the user based on these preferences (media information recommendation devices) have been proposed in the past.

(0003) For example, at the time of channel selection with a video device such as a television in the "recording and channel selection method for a video device" disclosed in Japanese Unexamined Patent Application Publication H7-135621, keywords for programs selected by a user are extracted from a program guide expressed by character strings, and the obtained keywords and the frequencies of occurrence thereof are stored and accumulated. When a program guide is newly supplied thereafter, keywords are extracted from the descriptions of the program guide, and the frequency of occurrence stored for each extracted keyword is investigated. A program is then recommended by presenting the user with a program having a high total of the frequency of occurrence of the keywords.

(0004) FIG. 17 is block configuration diagram of a conventional media information recommendation device. The conventional media information recommendation device comprises a media information reading part 1, an attribute extraction part 2, an access monitoring part 3, a history information managing part 4, a history information storage part 5, a media information evaluation part 6, a media information recommendation part 7, and a display part 8. The media information reading part 1 is a means for allowing a user to access a media information source 9 which provides media information to the user. The attribute extraction part 2 extracts attribute information from newly arrived media information outputted from a newly arrived information source 10. The access monitoring part 3 monitors which media information the user has read using the media information reading part 1, selects information related to the media information read by the user from among attribute information from the attribute extraction part 2, and outputs monitoring information. The history information managing part 4 updates the history information based on the monitoring information sent from the access monitoring part 3 and stores the information in the history information storage part 5. The media information evaluation part 6 evaluates the newly arrived information by comparing the attribute information from the attribute extraction part 2 based on the newly arrived information and the history information based on the access of the user. The media information recommendation part 7 recommends newly arrived information to the user by displaying attribute information on the display part 8 in accordance with the evaluation results of the media information evaluation part 6.

(0005) In the conventional media information recommendation device having the above configuration, history information is

stored in the history information storage part 5 each time the user accesses media information. On the other hand, when the newly arrived information source 10 outputs newly arrived information and the media information evaluation part 6 receives attribute information based on the newly arrived information from the attribute extraction part 2, the media information evaluation part 6 calculates an evaluation value for the newly arrived information by comparing the attribute information and the history information stored in the history information storage part 5. If this evaluation value is equal to or greater than a certain value, the media information recommendation part 7 recommends the newly arrived information to users by displaying the attribute information of the newly arrived information on the display part 8 such as a CRT.

(0006) In the case of the device disclosed in Japanese Unexamined Patent Application Publication H7-135621 described above, the media information source 9 in FIG. 17 corresponds to a television broadcast station; the media information reading part 1 corresponds to a television receiver; the attribute information corresponds to a program keyword; the history information corresponds to the frequency of occurrence of a keyword; and the evaluation value for newly arrived information corresponds to the total frequency of appearance of a keyword.

(0007) Incidentally, in recent years, it has become possible to transmit information regarding a television broadcast program simultaneously with the broadcast as an EPG (Electronic Program Guide). In digital satellite broadcasting in Japan as well, a program broadcast schedule is sent together with a program name and other character information to a receiver simultaneously with a television broadcast.

(0008) FIG. 45 is a block configuration diagram of a conventional media information recommendation device applied to an EPG. By performing a selection operation for media information from an operation input part 51, a user selects the media information from a media information source 52 and displays the information on an information display part 53. This configuration is included in the media information reading part 1 of FIG. 17. An information attention level evaluation part 54 detects the media information selected from the media information source 52 based on the input operation by the user from the operation input part 51, evaluates the degree to which the user was paying attention to the media information, and calculates an information attention level. Further, the information attention level evaluation part 54 stores a history of the input operations received by the operation input part 51 together with the calculated information attention level as operation history information in an operation history information storage part 55. The selections of media information performed by the user in the past are accumulated in this operation history information, so the user's interests are reflected in the information recommendation made based on this information. The operation history information storage part 55 corresponds to the history information storage part 5 in FIG. 17. An information recommendation part 56 selects media information that appears to coincide with the user's interests by comparing each piece of media information from the media information source 52 and the operation history information stored in the operation history information storage part 55 and recommends the media information to the user. There are various types of recommendation methods, examples of which include a method of displaying a title if a title is included in the media information or a method of displaying the entire media information. In addition, the information recommendation part

56 corresponds to the media information recommendation part 7 in FIG. 17.

(0009) Several methods have been proposed as calculation methods for the information attention level determined by the information attention level evaluation part 54. For example, there is a method of directly setting the information attention level to a value of 1 if the user has accessed the media information and a value of 0 if the user has not accessed the media information. This is a method which uses the presence or absence of access to the media information in question as the information attention level.

(0010) Another method of calculating the information attention level is a method of determining the information attention level based on the number of times that the user has accessed media information. That is, this is a method which sets the information attention level to N when the user has accessed the same media information N times.

(0011) Yet another method for calculating the information attention level is a method of determining the information attention level based on the access time when the user accesses the media information. This is a method which sets the information attention level based on the value of 1 hour when the user has accessed the same media information for 1 hour, for example.

(0012) The information attention level calculated as described above is stored in the operation history information storage part 55 together with the operation history information based on the input operations of the user. There are also several possible methods for storing information in this operation history information storage part 55. First, there is a method of storing an identification number of media information selected by the user and the information attention level as a set. In addition, it is also possible to use a method of storing the title of the media information and the information attention level as a set when the media information is a broadcast program which is broadcast with different content for a program of the same title such as a news program providing new information every day or a drama program in which a story is divided and broadcast sequentially every week. More specifically, the title of the program and the number of times that the user has viewed the program having that title are stored as a set in the operation history information storage part 55.

(0013) Further, there is also a method in which, when some sort of additional information is included in media information, the additional information is stored in the operation history information storage part 55 as a unit. For example, Japanese Unexamined Patent Application Publication H7-135621 described above discloses a configuration in which a keyword of a program selected by a user is extracted from a program guide expressed by character strings, and the keywords obtained as a result and the frequencies of occurrence thereof are accumulated. In this case, the additional information of a keyword is provided to each program, and the information attention level is calculated as the viewing frequency of the program. The information attention level is stored in the operation history information storage part 55 as a set with the keyword.

(0014)

(PROBLEM TO BE SOLVED BY THE INVENTION) Incidentally, in recent years, various media information sources have come to be used in each household. Examples include compact discs, televisions, teletext broadcasting, electronic shopping, WWW (World Wide Web), electronic news, e-mail, and computer programs. Information obtained when the user views or accesses one of these media information sources may be useful in

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