Among so much software, the quality of the software may be good or bad. For a user, he tends to hope that a software management system can recommend software with a high quality and more targeted for him. Therefore, currently most of the software management systems are integrated with a function of software recommendation.

[0006] In traditional art, a software management system recommends software based on the number of times of being downloaded or hotness of the software and software that has been installed. A way or channel of recommendation may include: pushing hot target software by using a rank list in a software repository, a recommendation page of special topics in a software repository, a tooltip, etc.

[0007] However, for existing solutions of recommending target software, relevance between recommended software and a specific user is low, which results in that recommendation may not be that accurate, and target software that meets usage features of a user may not be accurately recommended.

SUMMARY

[0008] In view of this, a method and a system for processing recommended software are disclosed to improve relevancy between recommended target software and a specific user, and improve accuracy of recommendation.

[0009] The technical solution is implemented as follows.

[0010] A method for processing recommended target software includes:

[0011] performing a cluster analysis for at least one ~~users~~user of at least one user client device based on software using information reported by the at least one ~~users~~user client device to determine a software list corresponding to each user cluster, and sorting software in the software list according to using condition of the software; and

[0012] determining a user cluster that is the most relevant to a specific user based on software using information of the specific user; and selecting top N pieces of software from a software list corresponding to the user cluster to recommend the selected top N pieces of software to the specific user, where N is a predefined value.

[0013] A system for processing recommended target software includes:

[0014] a cluster analysis module configured to perform a cluster analysis for at least one user of at least one user client device~~users~~ based on software using information reported by the ~~users~~at least one user client device to determine a software list corresponding to each user cluster, and sort software in the software list according to using condition of the software; and

[0015] a recommendation module configured to determine a user cluster that is the most relevant to a specific user based on software using information of the specific user; and select top N pieces of software from a software list corresponding to the user cluster to recommend the selected top N pieces of software to the specific user, where N is a predefined value.

[0016] Compared to that in the traditional art, in the present disclosure, software using information of users is fully considered, and based on this, a cluster analysis is performed for the users, different software lists are recommended to different user clusters; during use of a specific user, a user cluster (equivalent to the using feature type of a user) to which the specific user belongs is determined, and software that is in the front rank of a software list corresponding to the specific user is recommended. In this way, the recommended target software according to the present disclosure may have a high relevancy with the specific user, and the accuracy of recommendation is relatively high.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] For a better understanding of the present disclosure, reference should be made to the Detailed Description below, in conjunction with the following drawings in which like reference numerals refer to corresponding parts throughout the figures.

[0018] FIG.1 is a schematic diagram illustrating a flow of a method for processing recommended target software according to an embodiment of the present disclosure;

[0019] FIG.2 is a schematic diagram illustrating a structure of a system for processing recommended target software according to an embodiment of the present disclosure;

[0020] FIG.3 is a schematic diagram illustrating another structure of the system for processing recommended target software according to an embodiment of the present disclosure;

[0079] In this situation, since the program codes per se read from the storage medium may implement functions in any instance of the above embodiments, the program codes and the storage medium storing the program codes constitute a part of the mapping management technical solution.

[0080] Embodiments of the storage medium that stores the program codes include floppy disk, hard disk, magnetic disk, disc (e.g., CD-ROM, CD-R, CD-RW, DVD-ROM, DVD-RAM, DVD-RW, DVD+RW), magnetic tape, non-volatile memory and ROM. Alternatively, the program codes may be downloaded from a server computer via a communication network.

[0081] In addition, it should be understood that a part of or all actual operations may be carried out not only by executing the program codes read by a computer, but also by an operating system on a computer according to instructions based on program codes, so as to realize the functions of any of forgoing embodiments.

[0082] For example, Fig.6a is a schematic diagram illustrating another structure of the system for processing recommended target software according to an embodiment of the present disclosure~~Fig.6a is a schematic diagram illustrating another structure of the electronic map distance measurement apparatus according to an embodiment of the present disclosure~~. As shown in Fig.6a, the system may include a server and a client. The server includes a first memory and a first processor that communicates with the first memory, in which the first memory stores a cluster analysis instruction and a recommendation instruction executable by the first processor.

[0083] The cluster analysis instruction is configured to instruct performing a cluster analysis for users based on software using information reported by clients of the users, determining a software list corresponding to each user cluster, and sorting software in the software list according to using condition of the software.

[0084] The recommendation instruction is configured to instructing determining a user cluster which is the most relevant to a specific user according to software using information of a client of the specific user; and selecting first N pieces of software from a software list corresponding to the user cluster and recommending them to the specific user, where N is a predefined value.

[0085] Accordingly, the client may include a second memory and a second processor that

communicates with the second memory. The second memory stores data a collection instruction that is executable for the second processor and is configured to instruct collecting software using information of users who have a right of reporting data, and reporting data to the server.

[0086] Fig.6b is a schematic diagram illustrating another structure of the system for processing recommended target software according to an embodiment of the present disclosure.~~Fig.6b is a schematic diagram illustrating another structure of the electronic map distance measurement apparatus according to an embodiment of the present disclosure.~~ As shown in Fig.6b, the system may include a server and a client. The server includes a first memory and a first processor that communicates with the first memory, in which the first memory stores a cluster analysis instruction that is executable for the first processor.

[0087] The cluster analysis instruction is configured to instruct performing a cluster analysis for users based on software using information reported by clients of the user, determining a software list corresponding to each user cluster, sorting software in the software list according to using condition of the software, and sending information of each user cluster and a sorted software list corresponding to each user cluster to the client.

[0088] The client may include a second memory and a second processor that communicates with the second memory. The second memory stores a data collection instruction and a recommendation instruction that are executable for the second processor.

[0089] The data collection instruction is configured to instruct collecting software using information of users who have a right of reporting data, and reporting the software using information to the server; or instruct collecting software using information of users who have no a right of reporting data.

[0090] The recommendation instruction is configured to instruct obtaining software using information of a specific user on a client device by using data collection instruction on the client device, and instruct determining a user cluster that is the most relevant to the specific user according to the software using information of the client of the specific user; and selecting top N pieces of software from a software list corresponding to the user cluster and showing them as recommended software, where N is a predefined value.

[0091] As described in the above, the technical solution in the embodiments of the

WHAT IS CLAIMED IS:

1. A method for processing recommended target software, comprising:

performing a cluster analysis for at least one users of at least one user client device based on software using information reported by the at least one users client device to determine a software list corresponding to each user cluster, and sorting software in the software list according to using condition of the software; and

determining a user cluster that is the most relevant to a specific user based on software using information of the specific user; and selecting top N pieces of software from a software list corresponding to the user cluster and recommending the selected top N pieces of software to the specific user, where N is a predefined value.

2. The method according to claim 1, wherein the software using information reported by the at least one users client device comprises: software information of software that has been installed on the at least one user client devices; and

performing the cluster analysis for the at least one users of the at least one user client device based on the software using information reported by the at least one users client device comprises:

counting the amount of respective categories of installed software that is reported by respective sample users;

determining categories of software that has been installed the most by the respective sample users; and

performing cluster partition for the sample users by using the categories of the software that has been installed the most as similarity to obtain user clusters of different software using features.

3. The method according to claim 1, wherein sorting the software in the software list according to the using condition of the software comprises:

collecting the number of downloads of the respective software and the number of times of being started and running time of the respective software on ~~user~~ the at least one user client device~~s reported by sample users~~;

for each piece of software, respectively multiplying the number of downloads, the number of times of being started, and running time of the software by corresponding weights, and making a sum to obtain overall running hotness of the software, the overall running hotness of the software being the using condition of the software; and

sorting the software in the software list according to overall running hotness of the software.

4. The method according to claim 1, wherein the software using information of the specific user comprises: information of software that has been installed and/or information of software that is frequently started on a client device of the specific user; and

determining the user cluster that is the most relevant to the specific user based on the software using information of the specific user comprises:

in a software list corresponding to each user cluster, determining a cluster relevancy degree between each piece of software and the user cluster according to a rank of the software;

determining user clusters to which the respective software that has been installed and/or the respective software that is frequently started on the client device of the specific user belongs according to software lists corresponding to respective user clusters and cluster relevancy degrees of software in the software lists, and determining cluster relevancy degrees between the respective software that has been installed and/or the respective software that is frequently started and the user clusters to which they belong;

adding cluster relevancy degrees of software that belongs to a same user cluster to obtain a matching score of the user cluster; and

selecting a user cluster that has a highest matching score to be the user cluster that is the most relevant to the user.

5. The method according to claim 4, wherein adding the cluster relevancy degrees of the software that belongs to the same user cluster to obtain the matching score of the user cluster comprises:

allocating a higher weight to a piece of software that is frequently started than a weight allocated to a piece of software that has been installed, adding the cluster relevance degrees of the software that belongs to the same user cluster

according to software weights, and using a weighted sum as the matching score of the user cluster.

6. The method according to claim 1, wherein

performing the cluster analysis for the at least one user of the at least one user client devices based on the software using information reported by the at least one users client device to determine the software list corresponding to each user cluster, and sorting the software in the software list according to the using condition of the software are executed by a server;

the specific user is a user who has a right of reporting data; and

determining the user cluster that is the most relevant to the specific user based on the software using information of the specific user, and selecting the top N pieces of software from the software list corresponding to the user cluster to recommend the selected top N pieces of software to the specific user, comprise:

a client device of the specific user obtaining the software using information ~~of a client device~~ and uploading the software using information to the server;

the server determining the user cluster that is the most relevant to the specific user based on the software using information reported by the client device of the specific user, sending the top N pieces of software selected from the software list corresponding to the user cluster to the client device of the specific user; and

the client device of the specific user showing the top N pieces of software as recommended software.

7. The method according to claim 6, wherein after the client device of the specific user showing the top N pieces of software as the recommended software, the method further comprises:

the client device of the specific user sending using information of the recommended software to the server;

the server determining recommendation hotness of the recommended software according to the using information of the recommended software;

adjusting ranks of the recommended software in the software list corresponding to the user cluster according to the recommendation hotness of the recommended

software, raising a rank of recommended software whose recommendation hotness is larger than a specific threshold, and lowering a rank of recommended software whose recommendation hotness is smaller than the specific threshold.

8. The method according to claim 7, wherein the using information of the recommended software comprises at least one of: the number of installations of the software, time from starting the software to ending the software, and the number of secondary start-ups after the software is installed.

9. The method according to claim 1, wherein

performing the cluster analysis for the at least one users of the at least one user client device based on the software using information reported by the ~~total~~at least one user client device to determine the software list corresponding to each user cluster, and sorting the software in the software list according to the using condition of the software are executed by a server;

the specific user is a user who has no right of reporting data;

determining the user cluster that is the most relevant to the specific user based on the software using information of the specific user, and selecting the top N pieces of software from the software list corresponding to the user cluster to recommend the selected top N pieces of software to the specific user comprise:

the server sending information of each user cluster and a sorted software list corresponding to each user cluster to a client device of the specific user;

the client device of the specific user obtaining software using information on a device of the client device; and

the client device of the specific user determining the user cluster that is the most relevant to the specific user according to the software using information on the device of the client device, selecting the top N pieces of software from the software list corresponding to the user cluster as recommended software, and showing the recommended software.

10. The method according to any of claims 1 to 9, wherein selecting the top N pieces of software from the software list corresponding to the user cluster and recommending the selected top N pieces of software to the specific user comprise:

removing software that the specific user has installed from a list of software to be recommended of the user cluster, and selecting top N pieces of software from remaining software to recommend the selected top N pieces of software to the specific user.

11. The method according to claim 10, wherein N=1.

12. A system for processing recommended target software, comprising:

a cluster analysis module configured to perform a cluster analysis for at least one users of at least one user client device based on software using information reported by the at least one users client device to determine a software list corresponding to each user cluster, and sort software in the software list according to using condition of the software; and

a recommendation module configured to determine a user cluster that is the most relevant to a specific user based on software using information of the specific user; and select top N pieces of software from a software list corresponding to the user cluster to recommend the selected top N pieces of software to the specific user, where N is a predefined value.

13. The system according to claim 12, wherein the system further comprises: a data collection module, which is set at a client, configured to collect software using information of a user who has a right of reporting data, and report the collected software using information to the cluster analysis module and the recommendation module.

14. The system according to claim 13, wherein the cluster analysis module and the recommendation module are set at a server.

15. The system according to claim 13, wherein

the cluster analysis module is set at a server, and the recommendation module is set at the client;

the cluster analysis module is further configured to send information of each user cluster and a sorted software list corresponding to each user cluster to the client; and

the recommendation module is further configured to obtain the software using information of the specific user of a client device from the data collection module on the client device, determine the user cluster that is the most relevant to the specific user according to the software using information of the specific user, select the top N pieces of software from the software list corresponding to the user cluster as recommended software, and show the recommended software.

16. The system according to claim 12, wherein

the software using information reported by the at least one users comprises: software information of software that has been installed on client devices of the at least one users; and

the software using information of the specific user comprises: software information of software that has been installed on a client device of the specific user, and/or software information of software that is frequently started.

17. A system for processing recommended software, comprising a server and a client, wherein the server comprises a first memory and a first processor that communicates with the first memory, and the first memory stores a cluster analysis instruction and a recommendation instruction executable by the first processor;

the cluster analysis instruction is configured to perform a cluster analysis for at least one user of at least one user client device s based on software using information reported by the at least one user clientusers to determine a software list corresponding to each user cluster, and sort software in the software list according to using condition of the software; and

the recommendation instruction is configured to determine a user cluster that is the most relevant to a specific user based on software using information of the specific user; and select top N pieces of software from a software list corresponding to the user cluster to recommend the selected top N pieces of software to the specific user, where N is a predefined value.

18. The system according to claim 17, wherein the client comprises a second memory and a second processor that communicates with the second memory, wherein the second memory stores a data collection instruction that is executable for the second processor, and configured to collect software using information of a user having a right of reporting data and report the software using information to the server.

19. A system for recommending target software, comprising: a server and a client, wherein the server comprises a first memory and a processor that communicates with the first memory, wherein the first memory stores a cluster analysis instruction that is executable for the first processor; the client comprises a second memory and a second processor that communicates with the second memory, wherein the second memory stores a data collection instruction and a recommended instruction that are executable for the second processor;

the cluster analysis instruction is configured to instruct performing a cluster analysis for at least one users of at least one user client device based on software using information reported by the at least one user client device to determine a software list corresponding to each user cluster, sorting software in the software list according to using condition of the software, and sending information of each user cluster and the sorted software list corresponding to each user cluster to the client;

the data collection instruction is configured to instruct collecting software using information of a user who has a right of reporting data, and report the collected software using information to the server; or instruct collecting software using information of a user who has no right of reporting data; and

the recommendation instruction is configured to instruct obtaining the software using information of the specific user of a client device based on the data collection instruction of the client device, and instruct determining a user cluster that is the most relevant to the specific user based on the software using information of the client of the specific user; selecting top N pieces of software from the software list corresponding to the user cluster as recommended software and showing the recommended software, where N is a predefined value.

20. A computer readable storage medium, storing a computer program, wherein the computer program is configured to execute the method for processing recommended software according to any of claims 1 to 11.