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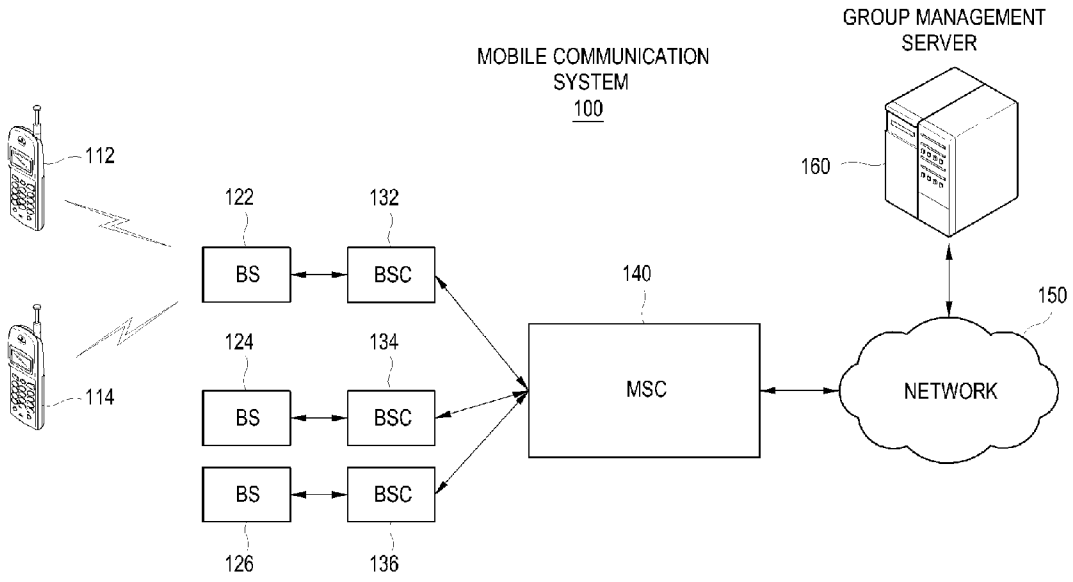
(54) **Title:** SYSTEM AND METHOD FOR FORMING A VIRTUAL GROUP OF MOBILE TERMINAL USERS



(57) **Abstract:** The present disclosure is directed to a system and method for forming and managing a group of mobile terminal users, who are predicted to share common interests or certain relationships with each other. Common interests or certain relationships are identified based on call characteristics such as contents and/or patterns of mobile communications between mobile terminal users. Based on the call characteristics, the system and method of the present disclosure automatically forms and manages a group of mobile terminal users to facilitate communication among the members.

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Description

SYSTEM AND METHOD FOR FORMING A VIRTUAL GROUP OF MOBILE TERMINAL USERS

Technical Field

[1] The present disclosure relates to grouping mobile terminal users, and more particularly, to a system and method for forming a group of mobile terminal users based on characteristics of communications between the users.

Brief Description of the Drawings

[2] The disclosure may best be understood by reference to the following description taken in conjunction with the following figures.

[3] Fig. 1 provides a schematic view of one embodiment of a mobile communication system for forming and managing a mobile terminal user group based on call characteristics of mobile communications.

[4] Fig. 2 shows a flowchart illustrating one embodiment of a method implemented by a group management server for forming and managing a virtual group of mobile terminal users.

[5] Fig. 3 shows a block diagram of one embodiment of a group management server.

[6] Fig. 4 illustrates a schematic diagram of one embodiment of inactive virtual groups stored in the virtual group database 410.

[7] Fig. 5 shows a schematic diagram of one embodiment of a mobile terminal which has received a membership request message from an inactive virtual group manager.

[8] Fig. 6 illustrates a flowchart showing one embodiment of a method for forming and managing an active virtual group of mobile terminal users.

[9] **BACKGROUND**

[10] Mobile terminals such as mobile phones, PDAs (personal digital assistants), laptop computers, portable email devices, etc. are widely used for communication. Using such mobile terminals, users communicate with each other via voice or character messages transmitted over wireless or wired networks. Indeed, millions of calls and messages are exchanged every day throughout the world.

[11] Mobile terminal communications can be classified broadly as personal, business or work, and hobby or interest related communications. Conventional mobile communication systems typically monitor and collect traffic statistics, such as information on any events that occurred during calls between mobile terminals and channel resources required for the calls. Such traffic statistics data may represent information relating to particular mobile terminals, including cell sojourn time, call holding time, call throughput, the number of handoffs, the number of calls originating from the mobile

unit, the number of calls terminating to a mobile unit, etc. Such data can be utilized to prioritize call handling within mobile communications systems and to assign customized customer service areas, as disclosed in U.S. Patent No. 5,623,535.

[12] Although such traffic statistics data collected by conventional mobile communication systems can represent information relating to calls generated by mobile terminals, they typically do not represent the communications characteristics between mobile terminal users such as certain relationships or common interests among the users. In general, there are certain characteristics or call patterns for communications between mobile terminal users. For example, phone calls may be made more frequently between users having common interests or close relationships. Further, the contents of calls between the users would vary depending on their hobbies or interests. Despite such call characteristics, conventional communications systems generally have not provided a convenient means for forming or managing groups of mobile terminal users based on call characteristics.

[13] In addition, users may create or join virtual clubs on the Internet with those having similar interests or to discuss and share their views on specific issues or topics. For example, blogs or Internet cafes have become popular on the Internet, often affecting public opinion and mass media. Such clubs, however, have generally required user's manual input to create or join the clubs.

[14] **SUMMARY**

[15] The present disclosure is directed to a system and method for forming and managing a group of mobile terminal users who share common interests or certain relationships with each other. Call characteristics such as call contents and/or statistics of mobile communications between mobile terminal users are examined to predict interests or relationships therebetween. Based on the call characteristics, the system and method of the present disclosure automatically form and manage a group of mobile terminal users to facilitate communication among the members.

[16] **DETAILED DESCRIPTION**

[17] In the following description, numerous specific details are set forth. It will be apparent, however, that these embodiments may be practiced without some or all of these specific details. In other instances, other well known process steps or elements have not been described in detail in order not to unnecessarily obscure the disclosure.

[18] The present disclosure is directed to a system and method for forming and updating a group of mobile terminal users based on characteristics of calls (e.g., communications) exchanged between mobile terminal users such as communication contents and traffic statistics of mobile communications between the users. In one embodiment, when a mobile terminal communicates with another mobile terminal, a group management server receives call contents and analyzes the call content data to determine call char-

acteristics indicating a relationship or an interest area. In another embodiment, the system monitors mobile terminal calls to generate call statistics (e.g., call metrics), which are analyzed to predict a level of relationship between the users. Based on the analysis, the system automatically forms and/or updates a group of users, who are then notified of the group to facilitate communication among the users who choose to be members of the group.

[19] Fig. 1 provides a schematic view of one embodiment of a mobile communication system 100 for forming and managing a mobile terminal user group based on call characteristics of mobile communications. The mobile communication system 100 includes mobile terminals 112 and 114, a plurality of base stations (BSs) 122, 124, and 126 for providing a wireless communication link between mobile terminals, a plurality of base station controllers (BSCs) 132, 134, and 136 for controlling the base stations 122, 124, and 126, respectively, and a mobile switching center (MSC) 140 for switching call connections. In addition, the mobile communication system 100 includes a group management server 160, which is connected to the MSC 140 through a network 150, for forming and updating a group of mobile terminal users based on characteristics of calls exchanged between mobile terminals such as call contents and traffic statistics of mobile calls between mobile terminal users.

[20] In the mobile communication system 100, the network 150 may be a wireless or wired Internet, campus or enterprise intranet, wide area network (WAN), local area network (LAN), or any other types of network. In addition, the present disclosure can be applied to networks that use any of a variety of communication techniques, including, for example, wireless data networks employing CDMA, TDMA, GSM technologies, datagram based networks (e.g., the Internet), connection based networks, and virtual circuit based networks such as Asynchronous Transfer Mode (ATM) networks, etc. Further, although the group management server 160 is connected to the MSC 140 through the network 150, it may be included in any other devices connected to the network 150, including mobile terminals, BS, BSC and MSC.

[21] In this embodiment, the MSC 140 monitors and stores traffic statistics for calls made between mobile terminals 112 and 114 through BS 122 and BSC 132. The traffic statistics may include the duration and number of calls made between mobile terminals 112 and 114 as well as geographical locations (e.g., cell locations) of the mobile terminals 112 and 114. The traffic statistics obtained by the MSC 140 is provided to the group management server 160 through the network 150. Although the mobile communication system 100 is illustrated using mobile terminals such as mobile phones 112 and 114, it should be appreciated that it is equally suitable for any type of mobile terminal devices having mobile communication capability such as PDAs (personal digital assistants), portable email devices, laptop computers, etc. In addition, although

only two mobile terminals 112 and 114 are shown in Fig. 1 for ease of explanation, it is understood that any number of mobile terminals (which access BSs 122, 124 and 126) may be employed in the mobile communication system 100.

[22] In addition, the MSC 140 monitors calls and messages between the mobile terminals 112 and 114 to store the call contents (e.g., voice conversation, text messages, etc.), which are provided to the group management server 160. For example, voice calls or messages between the mobile terminals 112 and 114 are routed via the BS122, BSC 132, and MSC 140. Specifically, the voice calls or messages encoded in the mobile terminal 112 (e.g., voice encoded digitally as PCM signal) are sent to the MSC 140 through the BS 122 and BSC 132. The MSC 140 then decodes the messages into call contents, which are stored and forwarded to the group management server 160. In one embodiment, it should be noted that since the voice/character messages communicated between mobile terminals 112 and 114 may contain privacy-related information, the system 100 is configured to request mobile terminal users' consent prior to collecting their voice/character messages.

[23] Fig. 2 shows a flowchart illustrating one embodiment of a method implemented by the group management server 160 for forming and managing a virtual group of mobile terminal users. Initially in operation 210, the group management server 160 requests and obtains mobile terminal users' consent for collecting and analyzing contents of their calls for forming or joining one or more mobile terminal user groups. This operation may be performed when the user initially signs up for a mobile service or at any time thereafter. After obtaining users' consent, the group management server 160 monitors calls between these mobile terminal users, and collects the traffic statistics data and/or call contents in operation 220. In an alternate embodiment, the group management server 160 receives the traffic statistics data and/or call contents of the calls from the MSC140, which is configured to monitor the calls and forward the information to the group management server 160.

[24] Then in operation 230, the traffic statistics data and/or call contents are then analyzed to predict and categorize the types of relationships and interests shared by the mobile terminal users. In this operation, the group management server 160 receives and analyzes the contents of voice and message calls communicated between mobile terminals to estimate a level of closeness or interest shared between the communicating parties. For example, communicating parties in a close personal relationship with each other frequently use emotional words to express views to each other in their communications. If the communicating parties have a personal relationship, they are more likely to use terms or keywords indicating a relationship in their calls such as "home," "love," etc. On the other hand, if the call contents include business-related terms or keywords such as "work," "conference," "deadline," etc., the communicating parties

can be considered to have a business relationship. Further, if the communicating parties share the same interest (e.g., sports, art, recreational activities), the messages would contain sports-related words such as "soccer,", "baseball," etc. These keywords, or any suitable combination of keywords, are provided, for example, in a memory to indicate the types of relationships. Based on the keywords or terms used in calls, the group management server 160 parses the call contents for these keywords or terms to predict a personal, business, or interest relationship between the mobile terminal users.

[25] In addition to call contents, traffic statistics of calls between communicating parties may indicate a type of their relationship and how closely they are related to each other. For example, when communicating parties frequently make lengthy phone calls with each other, it may indicate that they share a matter of interest or have a certain relationship with each other. If the mobile terminals of the communicating parties reside in a same geographical location (e.g., same cell location), they are likely to live or work in near each other. Similarly, the time when a call is made indicates a type of relationship shared between the communicating parties. For example, if the communicating parties make frequent calls with each other during daytime, they are more likely to have a business relationship. On the other hand, if they make frequent calls at night, they are more likely to have a personal relationship.

[26] With continuing reference to Fig. 2, in operation 240, the group management server 160 forms, based on the analysis of the traffic statistics data and/or call contents, a virtual group of mobile terminal users predicted to have a relationship. After the virtual group is formed, the group management server 160 may manage or update (either periodically or randomly) the virtual group of users based on new calls or traffic statistics.

[27] Fig. 3 shows a more detailed block diagram in one embodiment of the group management server 160 shown in Fig. 1. The group management server 160 is configured to receive call characteristics data, including traffic statistics data and contents of mobile terminal user calls, from the MSC 140 through an I/O interface 310. The call characteristics data are stored in a call statistics database 320 (e.g., memory, hard drive, etc.), which is accessed by a traffic statistics analyzer 330 and a message contents analyzer 340.

[28] In an alternative embodiment, the call characteristics data may not be received and stored in the database 320 but instead may be forwarded through the I/O interface 310 directly to the traffic statistics analyzer 330 and/or the message contents analyzer 340. In such case, the database 320 may not be present or used in the group management server 160, and a buffer memory for temporarily storing the call characteristics data may be installed in the I/O interface 310, the traffic statistics analyzer 330 or the message contents analyzer 340.

[29] The traffic statistics analyzer 330 analyzes the received traffic statistics data to

estimate the level of relationship formed between communicating parties. As described above, communicating parties who frequently make phone calls of long duration may be predicted to have a close relationship. Further, a time zone when communicating parties make phone calls indicates a type of their relationship. If communicating parties make frequent and/or lengthy phone calls during daytime, they may be predicted to have a business relationship. On the other hand, if such phone calls are made during the night, they are more likely to have a personal relationship.

[30] The message contents analyzer 340 analyzes the contents of calls (e.g., voice/ character messages) to categorize the types of predicted relationships between communicating parties. The message contents analyzer 340 may include a speech recognition unit or a natural language processing unit for recognizing the contents of voice messages. Further, the message contents analyzer 340 may include a plurality of template of key words, terms or phrases, which are categorized into a plurality of groups (e.g., business, personal and interest groups). For example, template terms used in sports games such as “soccer,” “baseball,” “basketball” are defined to represent an interest group related to "sports." In this case, the message contents analyzer 340 recognizes the contents (or terms) of messages and compares the recognized contents with the template terms, to categorize the messages into corresponding interest groups.

[31] Instead of receiving and storing the contents of the mobile terminal user calls and analyzing them in the message contents analyzer 340, the group management server 160 may receive only the keywords extracted from the contents of calls and analyze them in the message contents analyzer 340. In such case, the keywords may be extracted from the contents of calls in other components such as the BS, BSC or MSC of the mobile communication system 100 as shown in Fig. 1. Also, it is possible that such keywords are extracted from the contents of the calls in real time without storing the contents of the calls for any significant length of time. The traffic statistics data also can be determined in a similar manner in the components such as the BS, BSC or MSC, and be provided to the group management server 160 together with the keywords.

[32] The traffic statistics analyzer 330 and the message contents analyzer 340 transmit the analysis results to an inactive virtual group manager 350. The inactive virtual group manager 350 forms an inactive virtual group of users based on the analysis results, where the inactive virtual group includes users predicted to have a certain type of relationship and/or share common interests. For example, if the analysis of traffic statistics and messages exchanged between the users indicates that they made frequent and lengthy phone calls during daytime while the messages contain sports-related terms, the inactive virtual group may represent co-workers in a company who are commonly interested in sports. The users belonging to the inactive virtual group are not aware of

which group they belong to until they become active group members as described further below. The information on the formed inactive virtual groups is stored in a virtual group database 370. The inactive virtual group manager 350 may further analyze the information on the inactive virtual groups stored in virtual group database 370, e.g., for the purpose of managing an organization such as a company, and a school, etc.

[33] Fig. 4 illustrates a schematic diagram of one embodiment of inactive virtual groups stored in the virtual group database 410. The virtual group database 410 contains a data structure for a virtual group, and in this particular example, has four data fields, i.e., an active flag 402, a category field 404, a sub-category field 406, and a plurality of member fields 408. The virtual group database 410 stores a certain number of different categories of inactive virtual groups (e.g., business, personal and interest groups as shown in Fig. 4), each of which has a certain number of different sub-categories (e.g., marketing, research, soccer and friendship, as shown in Fig. 4).

[34] In this embodiment, user 2 and user 3, who work in the same department of a company, i.e., a research department, are predicted to share the same sports-related interest, i.e., soccer. Similarly, user 1 and user 5, who work in a marketing department of a company, are also predicted to have a close personal relationship. As such, each of mobile terminal users may belong to at least one of the inactive virtual groups formed by inactive virtual group manager 350.

[35] Once the inactive virtual group has been formed, the inactive virtual group manager 350 may perform a process of requesting the users of the inactive virtual group to confirm the formation of an active virtual group. For example, the inactive virtual group manager 350 sends messages through the I/O interface 310 to request the user members in the inactive virtual group to respond whether they will join the group or not.

[36] Fig. 5 shows a schematic diagram of one embodiment of a mobile terminal 500 which has received a membership request message from the inactive virtual group manager 350. After receiving the membership request message for requesting the user to select whether to join the inactive virtual group, the mobile terminal 500 displays a list of virtual groups (i.e., its category or sub-category and a list of group members) on display unit 510. In response, the user may accept or reject membership in one or more of the virtual groups by selecting one or more of check buttons 512 to 516 and one of "ACCEPT" and "REJECT" buttons 517 and 518. After the user has entered the selections, the mobile terminal 500 sends the selection responses to the inactive virtual group manager 350.

[37] Once the inactive virtual group manager 350 receives membership responses from one or more users of the inactive virtual group, it forms an active virtual group based

on the responses. For example, if one or more users receiving membership request messages respond to the inactive virtual group manager 350 by indicating that they will join the group, the inactive virtual group manager 350 converts the inactive virtual group into an active virtual group by setting the active field 402 in Fig. 4 to "ON" in the virtual group database 410, and inform the users belonging to the active virtual group of the group formation. The newly formed active virtual group is then managed and updated by the active virtual group manager 360 as additional calls among existing and/or new mobile terminals are monitored and analyzed.

[38] In addition, the active virtual group manager 360 may provide the users of the active virtual group a cyber space or other forum where they can share their opinions or communicate with each other. In the cyber space, e.g., a web page over the wireless data network or the Internet, various facilities such as a bulletin board, a three dimensional virtual world, a chatting tool, etc. may be provided to support their group activities.

[39] Fig. 6 illustrates a flowchart showing one embodiment of a method for forming and managing an active virtual group of mobile terminal users. Once an inactive virtual group of users has been formed, in operation 610, a virtual group manager (e.g., inactive virtual group manager 350 in Fig. 3) is configured to send a request to the users of the inactive virtual group to select whether they will join the group or not. For example, as shown in Fig. 5 above, when the mobile terminal 500 receives the membership request message requesting its user to determine whether to join the inactive virtual group, the mobile terminal 500 displays a list of virtual groups on a display unit 510. The user may then accept or reject joining one or more of the virtual groups by selecting one or more of check buttons 512 to 516 and one of "ACCEPT" and "REJECT" buttons 517 and 518. Based on the selections, the mobile terminal 500 sends a response for the message to the virtual group manager.

[40] The virtual group manager receives responses from the users of the inactive virtual group in operation 620 and forms an active virtual group based on the response in operation 630 as described above. At this point, the virtual group becomes an “active virtual group,” which means that members in the virtual group actively participate in the formation of the group and are also aware of which virtual group he/she belongs to.

[41] While the embodiments of the present disclosure have been described to use traffic statistics data and/or voice/character messages to analyze characteristics of mobile terminal users, any other types of data representative of the characteristics of the users, such as photo images and moving picture files, may be employed in implementing the embodiments. Further, any other types of groups as well as template terms and traffic statistics used in categorizing messages into the types of groups may be employed to implement the embodiments.

[42] Further, while various functional components have been described in the em-

bodiments of the present disclosure, it should be appreciated the embodiments can be implemented in hardware, software, firmware, middleware or a combination thereof and utilized in systems, subsystems, components, or sub-components thereof. When implemented in software, the elements of the embodiments may be the instructions/ code segments to perform the necessary tasks. The program or code segments can be stored in a machine readable medium, such as a processor readable medium or a computer program product, or transmitted by a computer data signal embodied in a carrier wave, or a signal modulated by a carrier, over a transmission medium or communication link. The machine-readable medium or processor-readable medium may include any medium that can store or transfer information in a form readable and executable by a machine (e.g. a processor, a computer, etc.).

Claims

[1] A system for forming a group of mobile terminal users, comprising:
a message processing unit configured to analyze characteristics of communications exchanged between mobile terminal users to predict a relationship between the users; and
a group manager configured to form a virtual group of mobile terminal users based on the predicted relationship.

[2] The system of claim 1, wherein the characteristics include contents of the communications exchanged between the mobile terminal users.

[3] The system of claim 1, wherein the characteristics include one or more keywords indicating a type of relationship between the mobile terminal users.

[4] The system of claim 1, wherein the characteristics include information on traffic statistics of the communications between the mobile terminal users.

[5] The system of claim 4, wherein the traffic statistics include information about the frequency, duration, time or location of the communications.

[6] The system of claim 1, wherein the system is configured to send a request to join the group to the users predicted to have the relationship.

[7] The system of claim 6, wherein the system is configured to form an active group of users who agree to join the group.

[8] The system of claim 1, wherein the system is configured to update the formed group based on new communications of the mobile terminal users.

[9] The system of claim 1, further comprising:
a mobile switching unit configured to monitor and store the characteristics of the communications exchanged between the mobile terminal users,
wherein the mobile switching unit is configured to provide the characteristics of the communications to the message processing unit.

[10] The system of claim 1, wherein the message processing unit includes:
a memory unit configured to store keywords indicating types of relationships between the mobile terminal users,
wherein the message processing unit is configured to analyze the communications based on the keywords stored in the memory unit.

[11] The system of claim 10, wherein the keywords include at least one of an emotional word indicating a personal relationship between the users and a business-related word indicating a business relationship between the users.

[12] A method for forming a group of mobile terminal users, comprising:
obtaining mobile terminal users' consent for analyzing characteristics of communications exchanged between the mobile terminal users;

analyzing the characteristics of the communications exchanged between mobile terminal users to predict a relationship between the users; and

forming a virtual group of mobile terminal users based on the predicted relationship.

[13] The method of claim 12, wherein the characteristics include contents of the communications exchanged between the mobile terminal users.

[14] The method of claim 12, wherein the characteristics include one or more keywords indicating a type of relationship between the mobile terminal users.

[15] The method of claim 12, wherein the characteristics include traffic statistics of the communications between the mobile terminal users.

[16] The method of claim 15, wherein the traffic statistics include information about the frequency, duration, time or location of the communications.

[17] The method of claim 12, further comprising:

sending a request to join the group to the users of the group predicted to have the relationship.

[18] The method of claim 17, further comprising:

forming an active group of users who agree to join the group.

[19] The method of claim 12, further comprising:

updating the group based on new communications of the mobile terminal users.

[20] The method of claim 12, further comprising:

storing keywords indicating types of relationships between the mobile terminal users;

wherein the operation of analyzing the characteristics of the communications is performed based on the keywords.

[21] The method of claim 20, wherein the keywords include at least one of an emotional word indicating a personal relationship between the users and a business-related word indicating a business relationship between the users.

[22] A computer-readable medium having a computer program stored thereon for forming a group of mobile terminal users, the computer program comprising instructions which performs:

accessing communications exchanged between mobile terminal users;

analyzing characteristics of the communications to predict a relationship between the users; and

forming a group of users based on the predicted relationship.

[23] The computer-readable medium of claim 22, wherein the characteristics include contents of the communications exchanged between the mobile terminal users.

[24] The computer-readable medium of claim 22, wherein the characteristics include one or more keywords indicating a type of relationship between the mobile

terminal users.

[25] The computer-readable medium of claim 22, wherein the characteristics include traffic statistics of the communications between the mobile terminal users.

[26] The computer-readable medium of claim 22, wherein the traffic statistics include information about the frequency, duration, time or location of the communications.

[27] The computer-readable medium of claim 22, further comprising instructions for: sending a request to join the group to the users of the group who are predicted to have the relationship.

[28] The computer-readable medium of claim 27, further comprising instructions for: forming an active group of users who agree to join the group.

[29] The computer-readable medium of claim 22, further comprising instructions for: updating the group based on new communications of the mobile terminal users.

[30] The computer-readable medium of claim 22, further comprising instructions for: storing keywords indicating types of relationships between the mobile terminal users;
wherein the instructions for analyzing the characteristics of the communications are performed based on the keywords.

[31] The computer-readable medium of claim 30, wherein the keywords include at least one of an emotional word indicating a personal relationship between the users and a business-related word indicating a business relationship between the users.

[32] A system for forming a virtual group of mobile terminal users, comprising:
a message processing unit configured to analyze characteristics of communications exchanged between mobile terminal users to predict users having common interests; and
a group manager configured to form groups of users predicted to have common interests.

[33] The system of claim 32, wherein the characteristics include contents of the communications exchanged between the mobile terminal users.

[34] The system of claim 32, wherein the characteristics include one or more keywords indicating corresponding interests of the mobile terminal users.

[35] The system of claim 32, wherein the characteristics include information on traffic statistics of the communications between the mobile terminal users.

[36] The system of claim 35, wherein the traffic statistics include information about the frequency, duration, time or location of the communications.

[37] The system of claim 32, wherein the system is configured to send a request to join the group to the users predicted to have the common interests.

[38] The system of claim 37, wherein the system is configured to form an active group of the users who are predicted to have the common interests and who agree to join the group.

[39] The system of claim 32, wherein the system is configured to update the formed group based on new communications of mobile terminal users.

[40] The system of claim 32, further comprising:
a mobile switching unit configured to monitor and store the characteristics of the communications exchanged between the mobile terminal users,
wherein the mobile switching unit is configured to provide the characteristics of the communications to the message processing unit.

[41] The system of claim 32, wherein the message processing unit includes:
a memory unit configured to store keywords indicating types of common interests shared between mobile terminal users,
wherein the message processing unit is configured to analyze the communications based on the keywords stored in the memory unit.

[42] A method for forming a virtual group of mobile terminal users, comprising:
obtaining mobile terminal users' consent for analyzing characteristics of communications exchanged between the mobile terminal users;
analyzing the characteristics of the communications exchanged between the mobile terminal users to predict users having common interests; and
forming a group of users predicted to have the common interests.

[43] The method of claim 42, wherein the characteristics include contents of the communications exchanged between the mobile terminal users.

[44] The method of claim 42, wherein the characteristics include one or more keywords indicating the common interests of the mobile terminal users.

[45] The method of claim 42, wherein the characteristics include information on traffic statistics of the communications between the mobile terminal users.

[46] The method of claim 45, wherein the traffic statistics include information about the frequency, duration, time or location of the communications.

[47] The method of claim 42, further comprising:
sending a request to join the group to the users predicted to have the common interests.

[48] The method of claim 47, further comprising:
forming an active group of the users who are predicted to have the common interests and who agree to join the group.

[49] The method of claim 42, further comprising:
updating the formed group based on new communications of the mobile terminal users.

[50] The method of claim 42, further comprising:
storing keywords indicating types of common interests shared between the mobile terminal users;
wherein the operation of analyzing the characteristics of the communications is performed based on the keywords.

[51] A system for forming a group of mobile terminal users, wherein a virtual group of mobile terminal users is formed based on characteristics of communications exchanged between the mobile terminal users, wherein the characteristics include communication contents and traffic statistics of the communications between the users.

[52] The system of claim 51, wherein the communication contents include one or more keywords indicating common interests or relationships between the mobile terminal users.

[53] The system of claim 52, wherein the keywords include at least one of an emotional word indicating a personal relationship between the users and a business-related word indicating a business relationship between the users.

[54] The system of claim 51, wherein the traffic statistics include information about the frequency, duration, time or location of the communications.

[55] The system of claim 51, wherein the system is configured to send a request to join the group to the users of the group predicted to have the common interests or the relationships.

[56] The system of claim 55, wherein the system is configured to form an active group of users who agree to join the group.

[57] The system of claim 51, wherein the system is configured to update the formed group based on new communications of mobile terminal users.

[58] A method for forming a group of mobile terminal users,
obtaining mobile terminal users' consent for analyzing characteristics of communications exchanged between the mobile terminal users;
forming a virtual group of mobile terminal users based on the characteristics of communications exchanged between the mobile terminal users,
wherein the characteristics include communication contents and traffic statistics of the communications between the users.

[59] The method of claim 58, wherein the communication contents include one or more keywords indicating common interests or relationships between the mobile terminal users.

[60] The method of claim 59, wherein the keywords include at least one of an emotional word indicating a personal relationship between the users and a business-related word indicating a business relationship between the users.

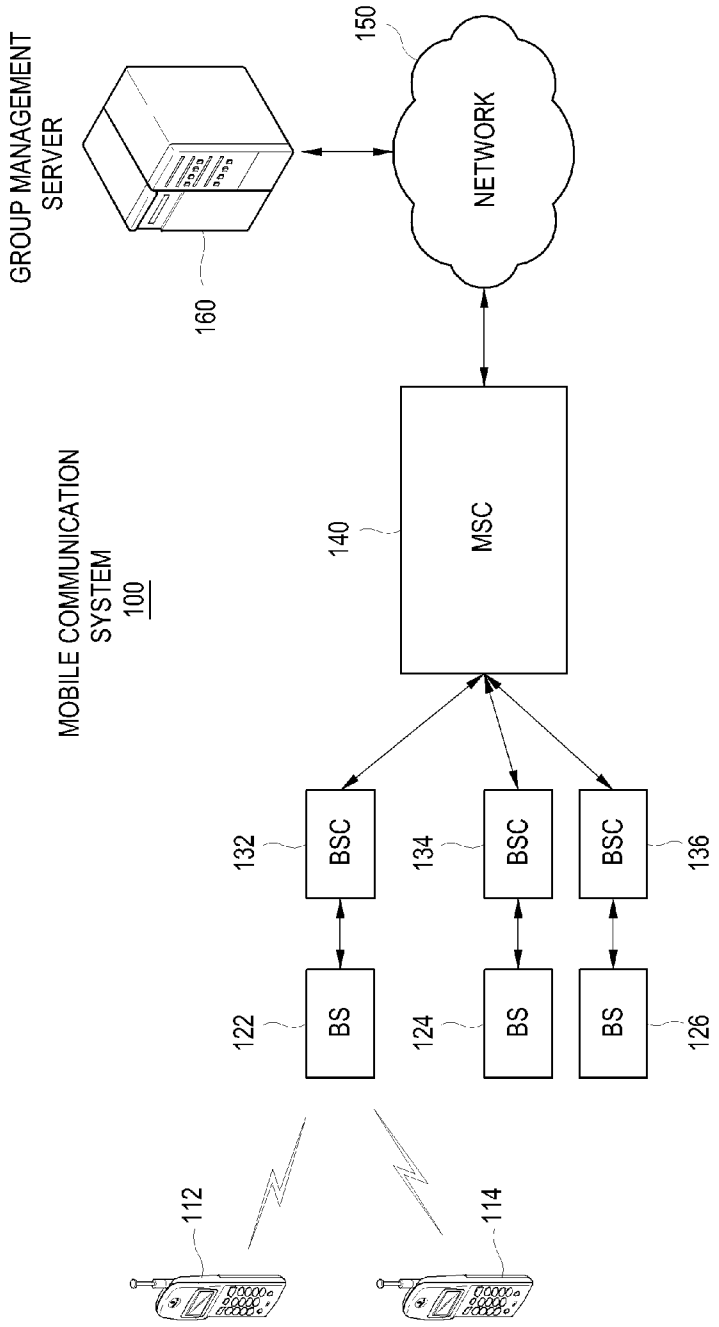
[61] The method of claim 58, wherein the traffic statistics include information about the frequency, duration, time or location of the communications.

[62] The method of claim 58, further comprising:
sending a request to join the group to the users of the group predicted to have the common interests or the relationships.

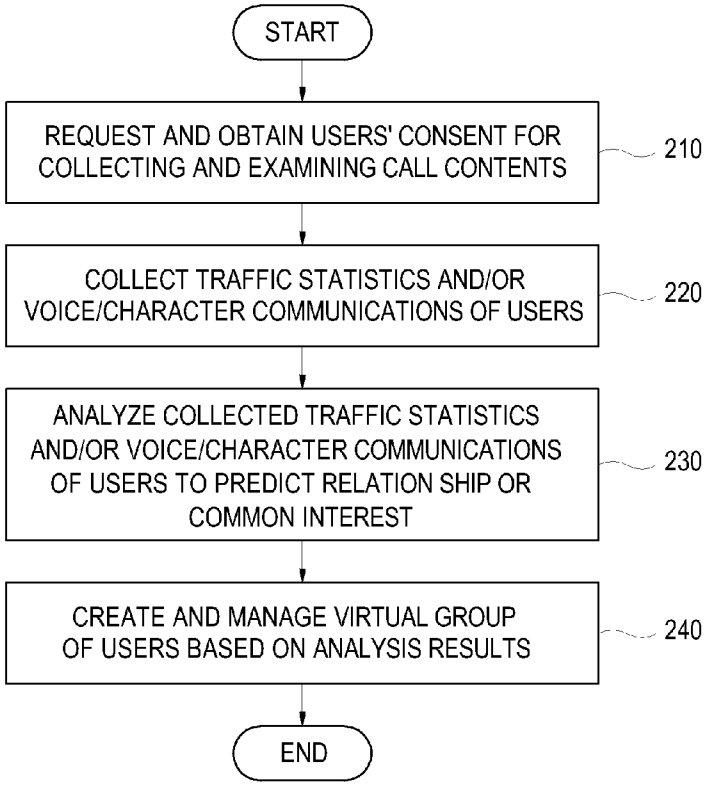
[63] The method of claim 62, further comprising:
forming an active group of users who agree to join the group.

[64] The method of claim 58, further comprising:
updating the formed group based on new communications of mobile terminal users.

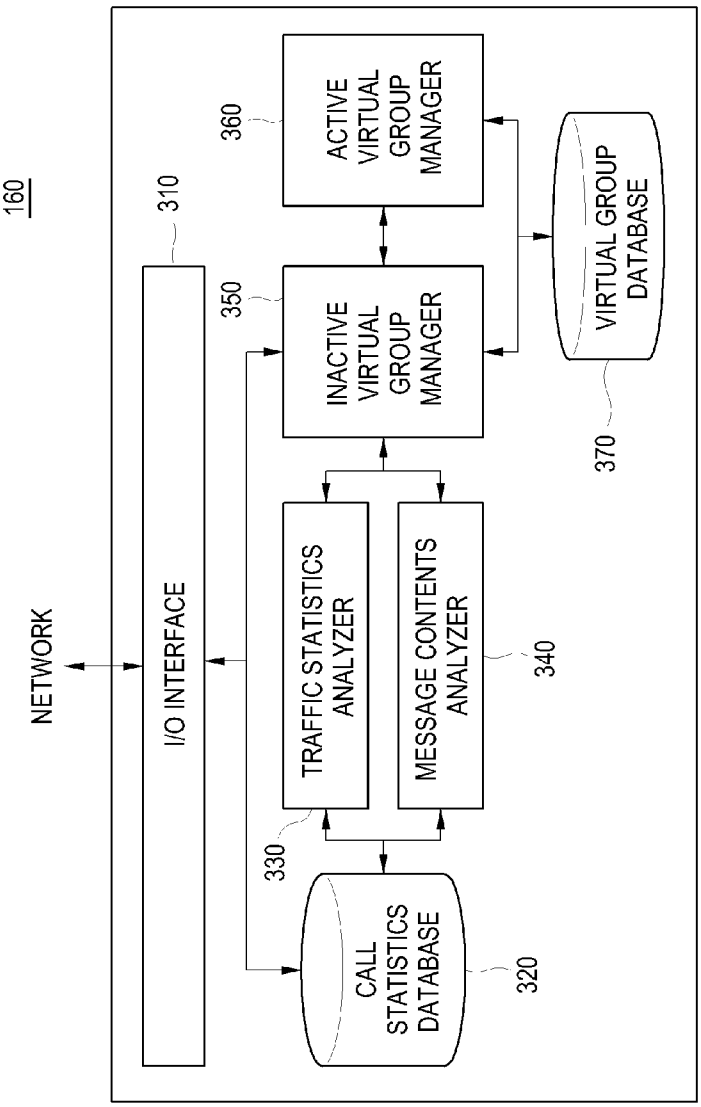
[Fig. 1]


GROUP MANAGEMENT SERVER
160
150
NETWORK
MOBILE COMMUNICATION SYSTEM
100
140
MSC
132
BSC
134
BSC
BSC
136
122
BS
124
BS
BS
126
112
114

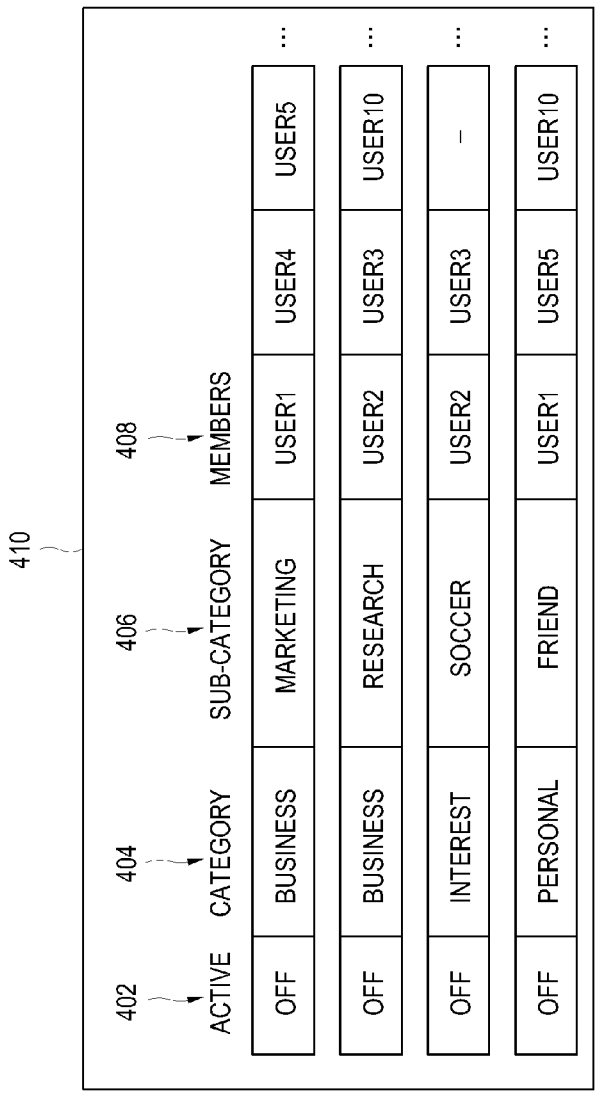
[Fig. 2]


START
REQUEST AND OBTAIN USERS' CONSENT FOR COLLECTING AND EXAMINING CALL CONTENTS
210
COLLECT TRAFFIC STATISTICS AND/OR VOICE/CHARACTER COMMUNICATIONS OF USERS
220
ANALYZE COLLECTED TRAFFIC STATISTICS AND/OR VOICE/CHARACTER COMMUNICATIONS OF USERS TO PREDICT RELATION SHIP OR COMMON INTEREST
230
CREATE AND MANAGE VIRTUAL GROUP OF USERS BASED ON ANALYSIS RESULTS
240
END

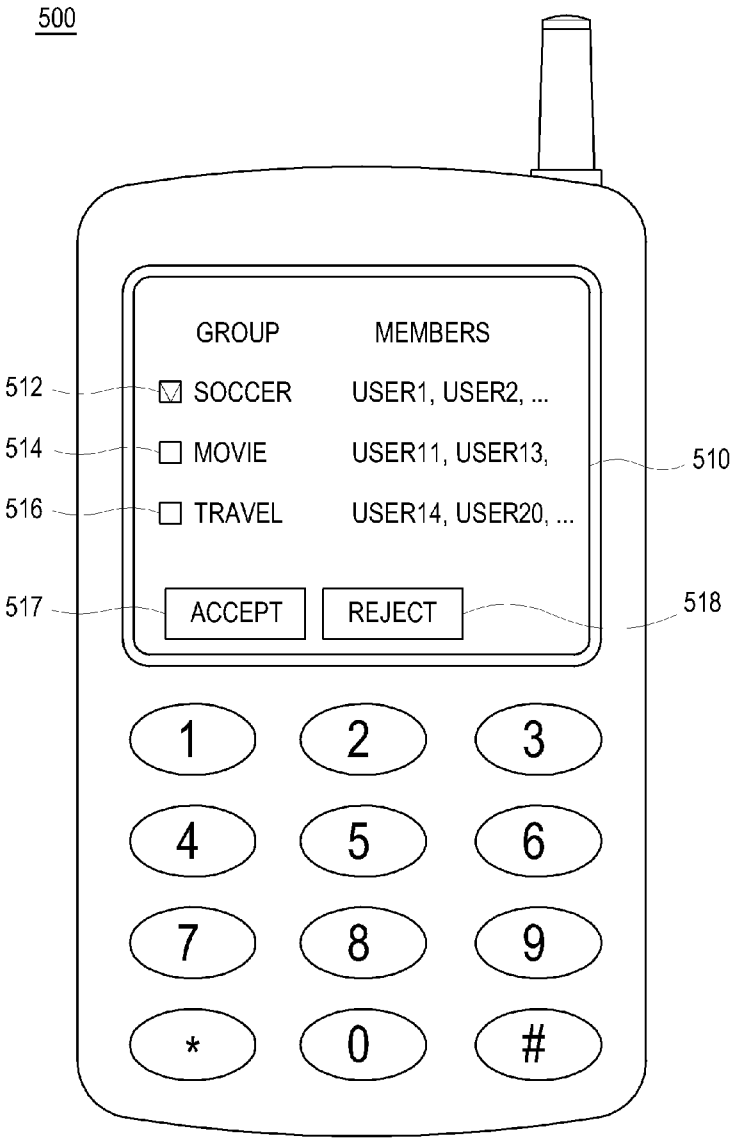
[Fig. 3]


160
NETWORK
I/O INTERFACE
310
ACTIVE VIRTUAL GROUP MANAGER
360
INACTIVE VIRTUAL GROUP MANAGER
350
VIRTUAL GROUP DATABASE
370
TRAFFIC STATISTICS ANALYZER
MESSAGE CONTENTS ANALYZER
340
330
CALL STATISTICS DATABASE
320

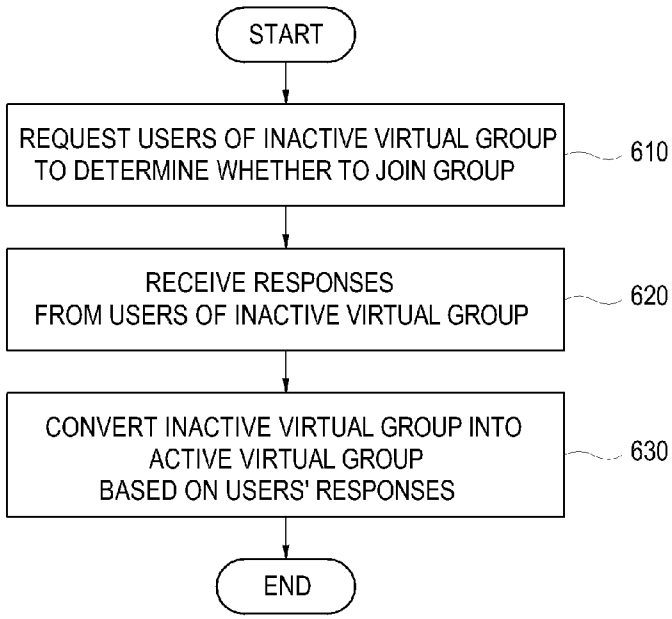
[Fig. 4]


410
402
ACTIVE
404
CATEGORY
406
SUB-CATEGORY
408
MEMBERS
OFF
BUSINESS
MARKETING
USER1
USER4
USER5
OFF
BUSINESS
RESEARCH
USER2
USER3
USER10
OFF
INTEREST
SOCCER
USER2
USER3
–
OFF
PERSONAL
FRIEND
USER1
USER5
USER10

[Fig. 5]


500
GROUP
MEMBERS
512
SOCCER
USER1, USER2, ...
514
MOVIE
USER11, USER13,
516
TRAVEL
USER14, USER20, ...
510
517
ACCEPT
REJECT
518
1
2
3
4
5
6
7
8
9
*
0
#

[Fig. 6]


START
REQUEST USERS OF INACTIVE VIRTUAL GROUP TO DETERMINE WHETHER TO JOIN GROUP
610
RECEIVE RESPONSES FROM USERS OF INACTIVE VIRTUAL GROUP
620
CONVERT INACTIVE VIRTUAL GROUP INTO ACTIVE VIRTUAL GROUP BASED ON USERS' RESPONSES
630
END

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2007/006900

A. CLASSIFICATION OF SUBJECT MATTER

H04Q 7/24(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 : H04Q 7/24

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility Models since 1975

Japanese Utility models and applications for Utility Models since 1975

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

eKIPASS(KIPO internal) "mobile, virtual, group"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2001-0106855 A (WEVUS CO., LTD) 07 Dec. 2001 See abstract, figures 1-3, claims 1-4 and page 2, line 21 - page 3, line 17	1-64
A	KR 10-2004-0069928 A (YOO, KYEONG S. et al.) 06 Aug. 2004 See abstract, figures 1-4, claims 1-6 and page 4, line 5 - page 5, line 11	1-64
A	KR 10-2001-0097753 A (HAHMO.COM CO., LTD) 08 Nov. 2001 See abstract, figure 3, claims 1-3 and page 3, line 5 - page 4, line 9	1-64
A	US 2001-0023187 A1 (Wilhelm, Michael) 20 Sep. 2001 See abstract, figure 1, claim 1, and paragraphs [0020]-[0032]	1-64
A	US 06839680 B1 (Liu, Albert M. et al.) 04 Jan. 2005 See abstract, figure 1, claims 1-2, and column 9, line 22 - column 10, line 56	1-64
A	JP 17062932 A (NTT DOCOMO INC) 10 Mar. 2005 See abstract, and figure 1	1-64

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 MARCH 2008 (20.03.2008)	**21 MARCH 2008 (21.03.2008)**

Name and mailing address of the ISA/KR

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Facsimile No. 82-42-472-7140

Authorized officer

KIM, Kwang Sik

Telephone No. 82-42-481-8355

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2007/006900

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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KR 1020040069928 A	06.08.2004	None	
KR 1020010097753 A	08.11.2001	None	
US 20010023187 A1	20.09.2001	EP01134997A1 JP2001313986A	19.09.2001 09.11.2001
US 06839680 B1	04.01.2005	JP2001142907A	25.05.2001
JP 17062932 A	10.03.2005	None	