Outbound Call Scheduling Method, Outbound Call System, Storage Medium and Electronic Device

The present disclosure claims priority to Chinese Patent Application No. 202410026660.0, filed on January 8, 2024, the entire contents of which are incorporated herein by reference.

Technical Field

The present disclosure relates to the technical field of data processing, and in particular, to an outbound call scheduling method, an outbound call system, a storage medium and an electronic device.

Background Art

An outbound call system (for example, an intelligent outbound call robot) can integrate conventional call center communication technologies, intelligent AI and other computer technologies, and actively initiate calls to customers (that is, called objects) by allocating outbound call line resources through a server. A server side has relevant information of the customers (that is, called object data), such as communication information and priority levels during calling. The server configures weights for the customers based on the relevant information of the customers, allocates the outbound call line resources to the customers according to the weights of the customers, and then enables multiple outbound call line resources in the outbound call system to execute outbound call operation at a target ratio. In some business scenarios (for example, banks conducting questionnaire surveys on customers), initiating outbound calls to customers at the target ratio can improve an outbound call connection rate.

However, missing attribute values in the called object data in the outbound call system may lead to outbound call failures. For example, the called object data acquired by the server lacks communication information of customers. Customers with failed outbound calls occupy outbound call line resources, which further prevents outbound call operation across multiple outbound call line resources from being executed at target ratios. Therefore, how to increase the connection rate of the outbound call system is an urgent problem to be solved at present.

Summary of the Invention

In view of the above problem, the present disclosure provides an outbound call scheduling method, an outbound call system, a storage medium and an electronic device, which solve the problem of how to increase a connection rate of the outbound call system.

To solve the above technical problem, the present disclosure provides the following solutions.

In a first aspect, the present disclosure provides an outbound call scheduling method applied to an outbound call system, wherein the outbound call system includes a plurality of storage modules, the plurality of storage modules being in one-to-one correspondence with a plurality of outbound call lines, and the method includes: acquiring called object data; when an integrity check result of the called object data indicates that the called object data is complete, calculating a first ratio of each storage module after the called object data is received by each storage module, the first ratio being used for indicating a percentage of a quantity of called object data in each storage module after importing the called object data relative to a total quantity of called object data in the plurality of storage modules after importing the called object data; and determining a target outbound call line for the called object data according to the first ratio and a second ratio, the second ratio being used for indicating a target ratio among the plurality of storage modules.

In combination with the first aspect, in a possible implementation manner, determining a target outbound call line for the called object data according to the first ratio and a second ratio, includes: calculating a difference between the first ratio and the second ratio of each storage module; and taking an outbound call line corresponding to the storage module with a minimum difference among the plurality of storage modules as the target outbound call line.

In combination with the first aspect, in another possible implementation manner, before calculating a first ratio of each storage module after the called object data is received byeach storage module, the method further includes: when there exists a storage module with a quantity of called object data being zero among the plurality of storage modules, taking an outbound call line corresponding to the storage module with the quantity of the called object data being zero as the target outbound call line.

In combination with the first aspect, in another possible implementation manner, outbound calls are initiated to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line.

In combination with the first aspect, in another possible implementation manner, initiating outbound calls to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line, includes: calculating a time difference between current time and expected outbound time indicated by each piece of called object data in the target outbound call line; sorting the plurality of pieces of called object data in the target outbound call line according to the time difference to obtain an outbound call sequence; and initiating outbound calls to mobile terminals corresponding to communication information

indicated by the plurality of pieces of called object data in the target outbound call line according to the outbound call sequence.

In combination with the first aspect, in another possible implementation manner, an integrity check result of the called object data indicating that the called object data is complete, includes: attribute values corresponding to various attributes in the called object data being non-null values, and a format of communication information in the called object data satisfying a preset format.

In a second aspect, the present disclosure provides an outbound call system, including: a plurality of storage modules, the plurality of storage modules being in one-to-one correspondence with a plurality of outbound call lines;

an acquisition module configured to receive called object data; and

a calculation module configured to: when an integrity check result of the called object data indicates that the called object data is complete, calculate a first ratio of each storage module after the called object data is received by each storage module, the first ratio being used for indicating a percentage of a quantity of called object data in each storage module after importing the called object data relative to a total quantity of called object data in the plurality of storage modules after importing the called object data; and determine a target outbound call line for the called object data according to the first ratio and a second ratio, the second ratio being used for indicating a target ratio among the plurality of storage modules.

In combination with the second aspect, in a possible implementation manner, the calculation module is specifically configured to: calculate a difference between the first ratio and the second ratio of each storage module; and take an outbound call line corresponding to the storage module with a minimum difference among the plurality of storage modules as the target outbound call line.

In combination with the second aspect, in another possible implementation manner, the calculation module is further configured to: when there exists a storage module with a quantity of called object data being zero among the plurality of storage modules, take an outbound call line corresponding to the storage module with the quantity of the called object data being zero as the target outbound call line.

In combination with the second aspect, in another possible implementation manner, the outbound call system further includes a call module configured to initiate outbound calls to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line.

In combination with the second aspect, in another possible implementation manner, the call module is specifically configured to: calculate a time difference between current time and

expected outbound time indicated by each piece of called object data in the target outbound call line; sort the plurality of pieces of called object data in the target outbound call line according to the time difference to obtain an outbound call sequence; and initiate outbound calls to mobile terminals corresponding to communication information indicated by the plurality of pieces of called object data in the target outbound call line according to the outbound call sequence.

In combination with the second aspect, in another possible implementation manner, the outbound call system further includes a filter module configured to: attribute values corresponding to various attributes in the called object data being non-null values, and a format of communication information in the called object data satisfying a preset format.

To achieve the above objective, according to a third aspect of the present disclosure, a storage medium is provided, including a program stored therein, wherein the program, when running, controls a device where the storage medium is located to execute the outbound call scheduling method according to the first aspect.

To achieve the above objective, according to a fourth aspect of the present disclosure, an electronic device is provided, including at least one processor, at least one memory connected to the processor, and a bus; wherein the processor and the memory communicate with each other via the bus; and the processor is configured to invoke program instructions in the memory to execute the outbound call scheduling method according to the first aspect.

With the above technical solutions, the technical solutions provided by the present disclosure have at least the following advantages.

For the outbound call scheduling method, the outbound call system, the storage medium and the electronic device provided by the present disclosure, in the present disclosure, by adding a plurality of storage modules in the outbound call system, outbound call scheduling of the acquired called object data is achieved, and the target outbound call line is selected for the called object data according to the first ratio of each storage module after the called object data is received by each storage module and the user-configured target ratio among the plurality of storage modules, which enables each outbound call line in the outbound call system to execute outbound call operation at the user-configured ratio, thereby improving an outbound call connection rate of the outbound call system.

The above description is merely an overview of the technical solutions of the present disclosure. To enable a clearer understanding of the technical means of the present disclosure and implementation in accordance with the contents of the specification, and to make the above and other objectives, features and advantages of the present disclosure more apparent, specific embodiments of the present disclosure are set forth below.

Brief Description of the Drawings

Various other advantages and benefits will become apparent to those of ordinary skill in the art upon reading the following detailed description of the preferred embodiments. The accompanying drawings are only for the purpose of illustrating preferred embodiments and shall not be construed as limiting the present disclosure. Throughout the drawings, identical reference numerals denote identical components. In the drawings:

FIG. 1 shows a schematic structural diagram of an electronic device provided by an example of the present disclosure;

FIG. 2 shows a schematic flow diagram of an outbound call scheduling method provided by an example of the present disclosure;

FIG. 3 shows a schematic diagram of importing called object data into storage modules provided by an example of the present disclosure;

FIG. 4 shows another schematic diagram of importing called object data into storage modules provided by an example of the present disclosure;

FIG. 5 shows a schematic flow diagram of another outbound call scheduling method provided by an example of the present disclosure; and

FIG. 6 shows a schematic structural diagram of an outbound call system provided by an example of the present disclosure.

Detailed Description of the Invention

Illustrative examples of the present disclosure will be described in more detail below with reference to the accompanying drawings. Although the illustrative examples of the present disclosure are shown in the accompanying drawings, it should be understood that the present disclosure may be implemented in various forms and shall not be limited by the examples set forth herein. On the contrary, these examples are provided to facilitate a thorough understanding of the present disclosure and to fully convey the scope of the present disclosure to those skilled in the art.

Terms such as “first” and “second” in the examples of the present disclosure have no logical or chronological dependency, nor do they limit quantity or execution sequence. It should also be understood that although the terms first, second, and the like are used to describe various elements in the following description, these elements shall not be limited by the terms. These terms are only used to distinguish one element from another.

The term “at least one” in the examples of the present disclosure means one or more, and the term “a plurality of” in the examples of the present disclosure means two or more.

It should also be understood that the term “if” may be interpreted as “when” or “upon” or “in response to determining” or “in response to detecting”. Similarly, depending on the context, the

phrase “if it is determined that...” or “if [the stated condition or event] is detected” may be interpreted as “when it is determined that...” or “in response to determining that...” or “when [the stated condition or event] is detected” or “in response to detecting [the stated condition or event]”.

For ease of understanding the solutions of the present disclosure, brief introductions to relevant concepts are provided as follows.

Outbound call: automatically dialing outbound called objects (for example, customers) via electronic devices (for example, computers) and playing pre-recorded voice to users.

The above is an introduction to technical terms involved in the examples of the present disclosure, which will not be repeated hereinafter.

As described in the Background Art, an outbound call system (for example, an intelligent outbound call robot) can integrate conventional call center communication technologies, intelligent AI and other computer technologies, and actively initiate calls to customers (that is, called objects) by allocating outbound call line resources through a server. A server side has relevant information of the customers (that is, called object data), such as communication information and priority levels of the customers during calling. The server configures weights for the customers based on the relevant information of the customers, allocates the outbound call line resources to the customers according to the weights of the customers, and then enables multiple outbound call line resources in the outbound call system to execute outbound call operation at a target ratio. In some business scenarios, initiating outbound calls to customers at the target ratio can improve an outbound call connection rate.

However, missing attribute values in the called object data in the outbound call system may lead to outbound call failures. For example, the called object data acquired by the server lacks communication information. Customers with failed outbound calls occupy outbound call line resources, which further prevents outbound call operation across multiple outbound call line resources from being executed at target ratios. Therefore, how to increase the connection rate of the outbound call system is an urgent problem to be solved at present.

In view of this, an example of the present disclosure provides an outbound call scheduling method, which specifically includes: acquiring called object data; when an integrity check result of the called object data indicates that the called object data is complete, calculating a first ratio of each storage module after the called object data is transmitted toeach storage module, the first ratio being used for indicating a percentage of a quantity of called object data in each storage module after importing the called object data relative to a total quantity of called object data in a plurality of storage modules after importing the called object data; and determining a target outbound call line for the called object data according to the first ratio and a second ratio, the second ratio being used for indicating a target ratio among the plurality of storage modules.

In the example of the present disclosure, by adding a plurality of storage modules in the outbound call system, outbound call scheduling of the acquired called object data is achieved, and the target outbound call line is selected for the called object data according to the first ratio of each storage module after the called object data is received byeach storage module and the user-configured target ratio among the plurality of storage modules, which enables each outbound call line in the outbound call system to execute outbound call operation at the user-configured ratio, thereby improving an outbound call connection rate of the outbound call system.

An example of the present disclosure further provides an outbound call system, which can be configured to execute the above outbound call scheduling method. Optionally, the outbound call system may be an electronic device with data processing capability or a functional module in the electronic device, which is not limited herein.

For example, the electronic device may be a server, which may be a single server or a server cluster composed of multiple servers. For another example, the electronic device may be a mobile phone, a tablet computer, a desktop computer, a laptop computer, a handheld computer, a notebook computer, an Ultra-mobile Personal Computer (UMPC), a netbook, a cellular phone, a Personal Digital Assistant (PDA), an Augmented Reality (AR) device, a Virtual Reality (VR) device and other terminal devices. For another example, the electronic device may also be a video recording device, a video monitoring device, and the like. The present disclosure imposes no special restrictions on the specific form of the electronic device.

Hereinafter, taking the outbound call system as an electronic device as an example, as shown in FIG. 1, FIG. 1 illustrates a hardware structure of an electronic device 100 provided by the present disclosure.

As shown in FIG. 1, the electronic device 100 includes a processor 110, a communication line 120 and a communication interface 130.

Optionally, the electronic device 100 may further include a memory 140, wherein the processor 110, the memory 140 and the communication interface 130 may be connected via the communication line 120;

wherein the processor 110 may be a Central Processing Unit (CPU), a general-purpose processor, a Network Processor (NP), a Digital Signal Processor (DSP), a microprocessor, a microcontroller, a Programmable Logic Device (PLD), or any combination thereof. The processor 110 may also be any other apparatus with processing functions, such as a circuit, an element or a software module, which is not limited herein.

In one instance, the processor 110 may include one or more CPUs, such as CPU0 and CPU1 in FIG. 1.

As an optional implementation manner, the electronic device 100 includes a plurality of

processors. For example, the electronic device 100 may further include a processor 170 in addition to the processor 110. The communication line 120 is configured to transmit information between various components included in the electronic device 100.

The communication interface 130 is configured to communicate with other devices or other communication networks. The other communication networks may be Ethernet, a Radio Access Network (RAN), Wireless Local Area Networks (WLANs), and the like. The communication interface 130 may be a module, a circuit, a transceiver or any apparatus capable of achieving communication.

The memory 140 is configured to store instructions, wherein the instructions may be computer programs;

wherein the memory 140 may be a Read-only Memory (ROM) or other types of static storage devices capable of storing static information and/or instructions, a Random Access Memory (RAM) or other types of dynamic storage devices capable of storing information and/or instructions, an Electrically Erasable Programmable Read-Only Memory (EEPROM), a Compact Disc Read-Only Memory (CD-ROM) or other optical disk storage, optical disc storage (including compact discs, laser discs, optical discs, digital versatile discs, Blu-ray discs, and the like), magnetic disk storage media or other magnetic storage devices, which is not limited herein.

It should be noted that the memory 140 may exist independently of the processor 110 or be integrated with the processor 110. The memory 140 may be configured to store instructions, program codes or some data, and the like. The memory 140 may be located inside or outside the electronic device 100, which is not limited herein.

The processor 110 is configured to execute instructions stored in the memory 140 to implement communication methods provided by the following examples of the present disclosure. For example, when the electronic device 100 is a terminal or a chip in the terminal, the processor 110 may execute instructions stored in the memory 140 to implement steps executed by a transmitting end in the following examples of the present disclosure.

As an optional implementation manner, the electronic device 100 further includes an output element 150 and an input element 160, wherein the output element 150 may be a display screen, a speaker or other elements capable of outputting data of the electronic device 100 to a user, and the input element 160 may be a keyboard, a mouse, a microphone, a joystick or other elements capable of inputting data to the electronic device 100.

It should be noted that the structure shown in FIG. 1 does not constitute a limitation on the electronic device. In addition to the components shown in FIG. 1, the electronic device may include more or fewer components than those illustrated, combine certain components, or adopt different component arrangements.

The outbound call system and application scenarios described in the examples of the present disclosure are intended to more clearly illustrate the technical solutions of the examples of the present disclosure, and do not constitute limitations on the technical solutions provided by the examples of the present disclosure. Those of ordinary skill in the art will recognize that as outbound call systems evolve and new business scenarios emerge, the technical solutions provided by the examples of the present disclosure are also applicable to similar technical problems.

The outbound call scheduling method will be described in detail below with reference to the accompanying drawings. FIG. 2 is a schematic flow diagram of an outbound call scheduling method provided by the present disclosure. The method is applied to an outbound call system with the hardware structure shown in FIG. 1, and specifically includes the following steps 210 to 230.

210. Acquiring called object data.

The outbound call system mainly includes two functions: acquiring called object data and initiating outbound call actions. Since different business scenarios require different called object data, in the examples of the present disclosure, the outbound call system receives a data generation request sent by a user, acquires data satisfying business scenario conditions from business data stored in the outbound call system, and generates called object data by filling data satisfying the business scenario conditions into a template corresponding to a business scenario.

Taking the business scenario of a bank conducting a questionnaire survey on a customer as an example, when the outbound call system receives the data generation request sent by the user, the outbound call system acquires data related to the bank conducting the questionnaire survey on the customer, such as a security level of the customer, an asset volume of the customer, customer name, telephone number, and the like. The acquired data is filled into the template corresponding to the business scenario to generate called object data of one customer, and the called object data includes information such as the security level of the customer, the asset volume of the customer, name and telephone number.

In addition, to solve the problems that missing attribute values in the called object data leads to outbound call failures, which further prevents outbound call operation across multiple outbound call line resources from being executed at target ratios, and results in low outbound call connection rates, in the examples of the present disclosure, integrity check is performed on the acquired called object data after acquiring the called object data.

In one embodiment, integrity check of the called object data is performed according to attribute values in the called object data and a format of communication information in the called object data. Taking a user telephone number as communication information as an example, firstly, it is determined whether attribute values corresponding to various attributes in the called object data are null values. If any attribute values corresponding to various attributes in the called object data

are null values, it is indicated that the called object data is incomplete, and the called object data is filtered out at this time, which avoids the problems that the outbound call system performs outbound call operation according to such called object data to occupy outbound call lines and result in low connection rates, and also prevents the outbound call operation ratio of multiple outbound call lines in the outbound call system from failing to satisfy the target ratio, thereby resulting in the phenomenon that the outbound call system cannot satisfy the business scenario corresponding to the target ratio. If none of the attribute values corresponding to various attributes in the called object data is null, further check is performed on the called object data. A format of the user telephone number in the called object data is checked for correctness (that is, whether the format of the user telephone number in the called object data is a preset format). If the format of the user telephone number in the called object data is incorrect, the outbound call system cannot extract a correct telephone number from the called object data, thereby leading to outbound call failure for this piece of called object data. Therefore, the called object data is deemed incomplete if the format of the user telephone number in the called object data is incorrect. Conversely, if the format of the user telephone number in the called object data is correct, the outbound call system can extract the correct telephone number from the called object data and initiate a call to this telephone number, and the called object data is deemed complete at this time.

For example, the called object data includes the user telephone number, an operator and an affiliated region. The user telephone number consists of 9 digits. The first piece of called object data acquired by the outbound call system has a user telephone number of 123456789, an operator AA and an affiliated region BB. The second piece of called object data has a user telephone number of 1234598AC, an operator CC and an affiliated region DD. The third piece of called object data has a user telephone number of 123459876, an operator EE and an affiliated region being a null value. Integrity check is performed on the first piece of called object data, the second piece of called object data and the third piece of called object data respectively. It can be seen that the first piece of called object data has no null attribute values and a correct telephone number format, so that the first piece of called object data is complete. The second piece of called object data has no null attribute values but an incorrect telephone number format, so that the second piece of called object data is incomplete. The third piece of called object data has a null attribute value, that is, an unknown affiliated region, so that the third piece of called object data is incomplete.

It should be noted that the integrity check of the called object data in the present disclosure is not limited to checking the attribute values in the called object data and the format of communication information in the called object data. The integrity check of the called object data may also include checking whether the user telephone number indicated by the called object data is in a blacklist,

and the like. In the examples of the present disclosure, other implementation manners included in the integrity check are not specifically limited, and the above steps included in the integrity check are only used as one implementation manner to explain the present disclosure.

220. When an integrity check result of the called object data indicates that the called object data is complete, calculating a first ratio of each storage module after the called object data is received byeach storage module.

To enable multiple outbound call lines in the outbound call system to execute outbound call operation at the target ratio, the outbound call system of the present disclosure includes a plurality of storage modules, and the storage modules are used by the outbound call system to determine the ratio of outbound call operation executed by each outbound call line after each outbound call line executes the called object data.

In one instance, the quantity of storage modules is the same as the quantity of outbound call lines in the outbound call system, and the plurality of storage modules in the outbound call system are in one-to-one correspondence with the plurality of outbound call lines. For example, if the outbound call system is provided with 3 outbound call lines, namely an outbound call line A, an outbound call line B and an outbound call line C respectively, 3 storage buckets, that is, a storage bucket 1, a storage bucket 2 and a storage bucket 3 are created, and the storage buckets are understood as storage modules, the storage bucket 1 corresponding to the outbound call line A, the storage bucket 2 corresponding to the outbound call line B, and the storage bucket 3 corresponding to the outbound call line C.

In one embodiment, when the outbound call system starts to execute outbound call operation, a plurality of pieces of called object data acquired are sequentially received bythe plurality of storage modules in the outbound call system. When the outbound call system starts to execute outbound call operation, none of the plurality of storage modules in the outbound call system contains called object data, and the ratio among the plurality of storage modules is zero at this time. If any one of the storage modules in the outbound call system contains no called object data, the ratio among the plurality of storage modules remains zero. To ensure that the outbound call system can finally execute outbound call operation at the target ratio, when the outbound call system starts to execute outbound call operation, one piece of called object data is received by each storage module, and each storage module receives different called object data. That is, when the outbound call system starts to execute outbound call operation and there exists a storage module with a quantity of called object data being zero among the plurality of storage modules, an outbound call line corresponding to the storage module with the quantity of the called object data being zero is taken as the target outbound call line.

FIG. 3 provides a schematic diagram of importing called object data into storage modules. As

shown in FIG. 3, the target ratio set by the user is 6:3:1, that is, the outbound call system includes 3 outbound call lines. The quantity of outbound call operation executed by the first outbound call line for the called object data accounts for 60% of the quantity of outbound call operation executed by the outbound call system, the quantity of outbound call operation executed by the second outbound call line for the called object data accounts for 30% of the quantity of outbound call operation executed by the outbound call system, and the quantity of outbound call operation executed by the third outbound call line for the called object data accounts for 10% of the quantity of outbound call operation executed by the outbound call system. Correspondingly, the first storage module corresponding to the first outbound call line receives 60% of the called object data in the outbound call system, the second storage module corresponding to the second outbound call line receives 30% of the called object data in the outbound call system, and the third storage module corresponding to the third outbound call line receives 10% of the called object data in the outbound call system.

When the outbound call system starts to execute outbound call operation, none of the first storage module, the second storage module and the third storage module contains called object data. At this time, the first piece of called object data is received by the first storage module, the second piece of called object data is received by the second storage module, and the third piece of called object data is received by the third storage module. At this time, the data quantity ratio among the first storage module, the second storage module and the third storage module is 1:1:1.

When each storage module in the outbound call system contains called object data, and when the outbound call system selects the storage module for the called object data, the first ratio of each storage module after the called object data is received byeach storage module is calculated. The first ratio is used for indicating a percentage of a quantity of called object data in each storage module after importing the called object data relative to a total quantity of called object data in the plurality of storage modules after importing the called object data.

FIG. 4 provides another schematic diagram of importing called object data into storage modules. As shown in FIG. 4, the outbound call system includes 3 outbound call lines and correspondingly includes 3 storage modules, and the target ratio set by the user is 6:3:1. A total of 10 pieces of called object data have been received by the 3 storage modules at present, and each of the 3 storage modules shown in FIG. 4 contains multiple pieces of called object data. Six pieces of called object data are received by the first storage module, 3 pieces of called object data are received by the second storage module, and 1 piece of called object data is received by the third storage module. At this time, the data quantity ratio among the first storage module, the second storage module and the third storage module is 6:3:1. The 11th piece of called object data is to be received bythe first storage module, the second storage module or the third storage module at this

time. Assuming that the 11th piece of called object data is received by the first storage module, the first storage module stores 7 pieces of called object data at this time, and the outbound call system has a total of 11 pieces of called object data. The first ratio of the first storage module after importing the 11th piece of called object data into the first storage module is calculated as 63.6%. Assuming that the 11th piece of called object data is received bythe second storage module, the second storage module stores 4 pieces of called object data at this time, and the outbound call system has a total of 11 pieces of called object data. The first ratio of the second storage module after importing the 11th piece of called object data into the second storage module is calculated as 36.4%. Assuming that the 11th piece of called object data is received by the third storage module, the third storage module stores 2 pieces of called object data at this time, and the outbound call system has a total of 11 pieces of called object data. The first ratio of the third storage module after importing the 11th piece of called object data into the third storage module is calculated as 18.2%.

230. Determining a target outbound call line for the called object data according to the first ratio and a second ratio.

After calculating the first ratio of each storage module after the called object data is received by each storage module in 220, the target outbound call line for the called object data is determined according to the first ratio and the second ratio. The second ratio is used for indicating a target ratio among the plurality of storage modules, that is, a preset percentage of the quantity of called object data stored in each storage module in the outbound call system relative to the total quantity of called object data stored in all storage modules in the outbound call system. It should be noted that the second ratio does not change with the quantity of called object data in each storage module, but can be specifically set according to scenario requirements.

In one embodiment, after obtaining the first ratio of each storage module after the called object data is received by storage module, a difference between the first ratio and the second ratio of each storage module is calculated. In some examples of the present disclosure, the target outbound call line for each piece of called object data is determined based on a difference value between the first ratio and the second ratio of each storage module or an absolute value of the difference value. For example, an outbound call line corresponding to the storage module with a minimum absolute value of the difference value among the plurality of storage modules is taken as the target outbound call line.

Taking FIG. 4 as an example, in 220, it is calculated that if the 11th piece of called object data is received by the first storage module, the first ratio of the first storage module is 63.6%; if the 11th piece of called object data is received bythe second storage module, the first ratio of the second storage module is 36.4%; and if the 11th piece of called object data is received by the third storage

module, the first ratio of the third storage module is 18.2%. Since before importing the 11th piece of called object data into the first storage module, the second storage module and the third storage module, the ratio among the first storage module, the second storage module and the third storage module is 6:3:1, that is, the second ratio of the first storage module before importing the 11th piece of called object data is 60%, the second ratio of the second storage module before importing the 11th piece of called object data is 30%, and the second ratio of the third storage module before importing the 11th piece of called object data is 10%, the absolute value of the difference value between the first ratio and the corresponding second ratio of each storage module is calculated according to the first ratio and second ratio of each storage module. The absolute value of the difference value of the first storage module is |63.6%−60%|=0.036, the absolute value of the difference value of the second storage module is |36.4%−30%|=0.064, and the absolute value of the difference value of the third storage module is |18.2%−10%|=0.082. By comparison, it can be seen that the first storage module has the minimum absolute value of the difference value among the 3 storage modules of the outbound call system, so that the outbound call line corresponding to the first storage module is taken as the target outbound call line for the 11th piece of called object data.

Since the business scenarios applied by the present disclosure require a large volume of outbound call data, for example, banks need to regularly make telephone questionnaire surveys to customers, and the customer volume of a bank may reach more than millions or tens of millions, the quantity of called object data acquired by the outbound call system when executing the bank questionnaire survey task also reaches more than millions or tens of millions. For outbound call systems with large data volumes, the method provided by the examples of the present disclosure can be adopted to enable outbound call lines in the outbound call system to execute outbound call operation at a pre-configured ratio.

In addition, after selecting the target outbound call line for the called object data, the ratio among various storage modules in the outbound call system needs to be recalculated for use when the outbound call system schedules the next piece of called object data.

Taking FIG. 4 as an example, the outbound call system schedules the 11th piece of called object data to the outbound call line corresponding to the first storage module. At this time, 7 pieces of called object data are received by the first storage module, 3 pieces of called object data are received by the second storage module, and 1 piece of called object data is received by the third storage module. At this time, the data quantity ratio among the first storage module, the second storage module and the third storage module is 6.4:2.7:0.9.

FIG. 5 is a schematic flow diagram of another outbound call scheduling method provided by an example of the present disclosure. Different from the above method shown in FIG. 2, after

determining the target outbound call line for the called object data according to the first ratio and the second ratio, outbound calls are initiated to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line.

510. Initiating outbound calls to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line.

In the present disclosure, after allocating a corresponding target outbound call line for the acquired called object data, the called object data in each outbound call line is sorted, and outbound calls are initiated to mobile terminals corresponding to user telephone numbers indicated by the called object data in each outbound call line according to a sorting result.

In one embodiment, a time difference between current time and expected outbound time indicated by each piece of called object data in the target outbound call line is calculated; the plurality of pieces of called object data in the target outbound call line are sorted according to the time difference to obtain an outbound call sequence; and outbound calls are initiated to mobile terminals corresponding to communication information indicated by the plurality of pieces of called object data in the target outbound call line according to the outbound call sequence.

In the examples of the present disclosure, the current time may be a current date, the expected outbound time is an expected outbound date, and then the time difference is calculated by days, that is, the time difference is a date difference. For example, the current time is December 25, 2023, the expected outbound time is December 30, 2023, and then the time difference is the date difference between December 25, 2023 and December 30, 2023, that is, -5 days; the current time is December 25, 2023, the expected outbound time is December 20, 2023, and then the time difference is the date difference between December 25, 2023 and December 20, 2023, that is, +5 days; that is, the earlier the expected outbound time indicated by the called object data, the larger the time difference. The time difference being a positive integer indicates that the current time has exceeded the expected outbound time, and the time difference being a negative integer indicates that the current time has not reached the expected outbound time yet.

For multiple pieces of called object data with the same expected outbound time, the time differences are also the same. When sorting a plurality of pieces of called object data in each outbound call line in a descending order of time differences, these pieces of called object data are sorted in parallel. For example, called object data 1 is ranked first (sequence number 1), called object data 2, called object data 3 and called object data 4 are ranked second (sequence numbers 2, 3 and 4 respectively), and called object data 2, called object data 3 and called object data 4 are parallel called object data. In this case, the outbound sequence may be determined directly in an

ascending order of sequence numbers, or the parallel called object data may be sorted randomly.

After obtaining the outbound call sequence of each outbound call line, outbound calls are initiated to mobile terminals corresponding to communication information indicated by the plurality of pieces of called object data in the target outbound call line according to the outbound call sequence, thereby achieving outbound call scheduling of the outbound call system.

In summary, in the present disclosure, by adding a plurality of storage modules in the outbound call system, outbound call scheduling of the acquired called object data is achieved, and the target outbound call line is selected for the called object data according to the first ratio of each storage module after the called object data is received by each storage module and the user-configured target ratio among the plurality of storage modules, which enables each outbound call line in the outbound call system to execute outbound call operation at the user-configured ratio, thereby improving an outbound call connection rate of the outbound call system.

It can be understood that to achieve the functions in the above examples, a computer device includes corresponding hardware structures and/or software modules for executing various functions. Those skilled in the art will readily recognize that the present disclosure can be implemented in hardware or a combination of hardware and computer software with reference to each illustrated unit and method step described in the examples disclosed in the present disclosure. Whether a certain function is executed by hardware or computer software driving hardware depends on the specific application scenario and design constraints of the technical solution.

Further, as an implementation of the method example shown in FIG. 2 or FIG. 3, an example of the present disclosure provides an outbound call system. The example of the outbound call system corresponds to the foregoing method examples. For ease of reading, details of the foregoing method examples will not be repeated one by one in this example, but it shall be clear that the outbound call system in this example can correspondingly implement all contents of the foregoing method examples. As specifically shown in FIG. 6, the outbound call system 600 includes:

a plurality of storage modules 610, the plurality of storage modules being in one-to-one correspondence with a plurality of outbound call lines;

an acquisition module 620, configured to receive called object data; and

a calculation module 630, configured to: when an integrity check result of the called object data indicates that the called object data is complete, calculate a first ratio of each storage module after the called object data is received by each storage module, the first ratio being used for indicating a percentage of a quantity of called object data in each storage module after importing the called object data relative to a total quantity of called object data in the plurality of storage modules after importing the called object data; and determine a target outbound call line for the called object data according to the first ratio and a second ratio, the second ratio being used for indicating a

target ratio among the plurality of storage modules.

Further, as shown in FIG. 6, the calculation module 630 is specifically configured to: calculate a difference between the first ratio and the second ratio of each storage module; and take an outbound call line corresponding to the storage module with a minimum difference among the plurality of storage modules as the target outbound call line.

Further, as shown in FIG. 6, the calculation module 630 is further configured to: when there exists a storage module with a quantity of called object data being zero among the plurality of storage modules, take an outbound call line corresponding to the storage module with the quantity of the called object data being zero as the target outbound call line.

Further, as shown in FIG. 6, the outbound call system further includes a call module 640 configured to initiate outbound calls to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line.

Further, as shown in FIG. 6, the call module 640 is specifically configured to: calculate a time difference between current time and expected outbound time indicated by each piece of called object data in the target outbound call line; sort the plurality of pieces of called object data in the target outbound call line according to the time difference to obtain an outbound call sequence; and initiate outbound calls to mobile terminals corresponding to communication information indicated by the plurality of pieces of called object data in the target outbound call line according to the outbound call sequence.

Further, as shown in FIG. 6, the outbound call system further includes a filter module 650 configured to: attribute values corresponding to various attributes in the called object data being non-null values, and a format of communication information in the called object data satisfying a preset format.

An example of the present disclosure provides a storage medium having a program stored thereon, wherein the program, when executed by a processor, implements the outbound call scheduling method.

An example of the present disclosure provides a processor configured to run a program, wherein the program, when running, executes the outbound call scheduling method.

The present disclosure further provides a computer program product which, when executed on a data processing device, is suitable for executing a program initialized with the following method steps: acquiring called object data; when an integrity check result of the called object data indicates that the called object data is complete, calculating a first ratio of each storage module after the called object data is received by each storage module, the first ratio being used for indicating a percentage of a quantity of called object data in each storage module after importing

the called object data relative to a total quantity of called object data in a plurality of storage modules after importing the called object data; and determining a target outbound call line for the called object data according to the first ratio and a second ratio, the second ratio being used for indicating a target ratio among the plurality of storage modules.

Further, determining a target outbound call line for the called object data according to the first ratio and a second ratio, includes: calculating a difference between the first ratio and the second ratio of each storage module; and taking an outbound call line corresponding to the storage module with a minimum difference among the plurality of storage modules as the target outbound call line.

Further, before calculating a first ratio of each storage module after the called object data is received byeach storage module, the method further includes: when there exists a storage module with a quantity of called object data being zero among the plurality of storage modules, taking an outbound call line corresponding to the storage module with the quantity of the called object data being zero as the target outbound call line.

Further, outbound calls are initiated to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line.

Further, initiating outbound calls to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line, includes: calculating a time difference between current time and expected outbound time indicated by each piece of called object data in the target outbound call line; sorting the plurality of pieces of called object data in the target outbound call line according to the time difference to obtain an outbound call sequence; and initiating outbound calls to mobile terminals corresponding to communication information indicated by the plurality of pieces of called object data in the target outbound call line according to the outbound call sequence.

Further, integrity check of called object data includes: attribute values corresponding to various attributes in the called object data being non-null values, and a format of communication information in the called object data satisfying a preset format.

The present disclosure is described with reference to flowcharts and/or block diagrams of methods, devices (systems), and computer program products according to the examples of the present disclosure. It shall be understood that each flow and/or block in the flowcharts and/or block diagrams, as well as combinations of flows and/or blocks in the flowcharts and/or block diagrams, may be implemented by computer program instructions. These computer program instructions may be provided to a processor of a general-purpose computer, a special-purpose computer, an

embedded processor, or other programmable data processing devices to create a machine, so that the instructions executed by the processor of the computer or other programmable data processing devices create apparatuses for implementing the functions specified in one or more flows of the flowchart and/or one or more blocks of the block diagram.

In a typical configuration, a device includes one or more central processing units (CPUs), a memory and a bus. The device may further include an input/output interface, a network interface, and the like.

The memory may include a non-persistent memory in a computer-readable medium, a Random Access Memory (RAM), and/or a non-volatile memory, and other forms, such as a Read-Only Memory (ROM) or a flash RAM. The memory includes at least one storage chip. The memory is an instance of the computer-readable medium.

The computer-readable media include permanent and non-permanent, removable and non-removable media implemented by any method or technology for information storage. Information may be computer-readable instructions, data structures, program modules, or other data. Instances of computer storage media include, but are not limited to, a Phase-Change Random Access Memory (PRAM), a Static Random Access Memory (SRAM), a Dynamic Random Access Memory (DRAM), other types of Random Access Memories (RAMs), a Read-Only Memory (ROM), an Electrically Erasable Programmable Read-Only Memory (EEPROM), a flash memory or other memory technologies, a Compact Disc Read-Only Memory (CD-ROM), a Digital Versatile Disc (DVD) or other optical storage, magnetic tape cassettes, magnetic disk storage or other magnetic storage devices, or any other non-transmission medium that can store information accessible by a computing device. As defined herein, the computer-readable media exclude transitory media, such as modulated data signals and carrier waves.

It shall also be noted that the terms “including”, “containing”, or any other variant thereof are intended to cover non-exclusive inclusion, so that a process, method, article, or device that includes a list of elements includes not only those elements but also other elements not expressly listed, or elements inherent to such process, method, article, or device. Without further limitations, an element defined by the phrase “including one ...” does not exclude the presence of additional identical elements in the process, method, article, or device that includes the element.

Those skilled in the art shall appreciate that the examples of the present disclosure may be provided as a method, a system, or a computer program product. Accordingly, the present disclosure may take the form of an entirely hardware example, an entirely software example, or an example combining software and hardware aspects. Furthermore, the present disclosure may take the form of a computer program product embodied on one or more computer-usable storage media (including, without limitation, a disk memory, a CD-ROM, an optical memory, and the like)

containing computer-usable program codes.

The foregoing are merely examples of the present disclosure and are not intended to limit the present disclosure. Various modifications and variations may be made to the present disclosure by those skilled in the art. Any modifications, equivalent substitutions, improvements, and the like made within the spirit and principle of the present disclosure shall fall within the scope of the claims of the present disclosure.

Claims

1. An outbound call scheduling method applied to an outbound call system, wherein the outbound call system comprises a plurality of storage modules, the plurality of storage modules being in one-to-one correspondence with a plurality of outbound call lines, and the method comprises:

receiving called object data;

when an integrity check result of the called object data indicates that the called object data is complete, calculating a first ratio of each storage module after the called object data is transmitted to each storage module, the first ratio being used for indicating a percentage of a quantity of called object data in each storage module after the called object data is received, relative to a total quantity of called object data in the plurality of storage modules after receipt of the called object data; and

determining a target outbound call line for the called object data according to the first ratio and a second ratio, the second ratio being used for indicating a target ratio among the plurality of storage modules.

2. The method according to claim 1, wherein determining a target outbound call line for the called object data according to the first ratio and a second ratio, comprises:

calculating, for each of the plurality of storage modules, a difference between the first ratio and the second ratio of each storage module; and

taking an outbound call line corresponding to the storage module with a minimum difference among the plurality of storage modules as the target outbound call line.

3. The method according to claim 1, wherein before calculating a first ratio of each storage module after the called object data is received by each storage module, the method further comprises:

when there exists a storage module with a quantity of called object data being zero among the plurality of storage modules, taking an outbound call line corresponding to the storage module with the quantity of the called object data being zero as the target outbound call line.

4. The method according to claim 1, further comprising:

initiating outbound calls to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line.

5. The method according to claim 4, wherein initiating outbound calls to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line, comprises:

calculating a time difference between current time and expected outbound time indicated by each

piece of called object data in the target outbound call line;

sorting the plurality of pieces of called object data in the target outbound call line according to the time difference to obtain an outbound call sequence; and

initiating outbound calls to mobile terminals corresponding to communication information indicated by the plurality of pieces of called object data in the target outbound call line according to the outbound call sequence.

6. The method according to claim 1, wherein an integrity check of the called object data indicating that the called object data is complete, comprises: attribute values corresponding to various attributes in the called object data being non-null values, and a format of communication information in the called object data satisfying a preset format.

7. An outbound call system, comprising: a plurality of storage modules, the plurality of storage modules being in one-to-one correspondence with a plurality of outbound call lines;

an acquisition module configured to receive called object data; and

a calculation module configured to: when an integrity check result of the called object data indicates that the called object data is complete, calculate a first ratio of each storage module after the called object data is received by each storage module, the first ratio being used for indicating a percentage of a quantity of called object data in each storage module after importing the called object data relative to a total quantity of called object data in the plurality of storage modules after importing the called object data; and determine a target outbound call line for the called object data according to the first ratio and a second ratio, the second ratio being used for indicating a target ratio among the plurality of storage modules.

8. The system according to claim 7, wherein the outbound call system further comprises: a call module configured to: initiate outbound calls to mobile terminals corresponding to communication information indicated by a plurality of pieces of called object data according to expected outbound time indicated by the plurality of pieces of called object data in the target outbound call line.

9. A storage medium, comprising a program stored therein, wherein the program, when running, controls a device where the storage medium is located to execute the outbound call scheduling method according to any one of claims 1 to 6.

10. An electronic device, comprising at least one processor, at least one memory connected to the processor, and a bus; wherein the processor and the memory communicate with each other via the bus; and the processor is configured to invoke program instructions in the memory to execute the outbound call scheduling method according to any one of claims 1 to 6.