

# **MARKETING INFORMATION SENDING METHOD, APPARATUS, AND DEVICE**

## **TECHNICAL FIELD**

**[0001]** This application relates to the field of Internet technologies, and in particular, to a marketing information sending method, apparatus, and device.

## **BACKGROUND**

**[0002]** Marketing can refer to the process of discovering the demand of prospective consumers, letting the consumers know about a product of a merchant, and sending discounts to the consumers, thereby pushing the consumers to purchase the product. Currently, before pushing marketing information of the merchant to a user, a marketing service provider usually needs to obtain related user information of the user from other applications, to accurately identify whether the user is an audience member of the marketing information of the merchant. However, the other applications cannot directly send the related user information of the user to the marketing service provider for use due to requirements on the security and privacy of the related user information of the user in data management regulations.

**[0003]** Based on this, how to enable the marketing service provider to accurately identify, by using the related user information of the user, whether to send specified marketing information to the user without leaking the related user information of the user becomes a technical problem to be urgently resolved.

## **SUMMARY**

**[0004]** Embodiments of this specification provide a marketing information sending method, apparatus, and device, to enable a marketing service provider to accurately identify, by using related user information of a user, whether to send specified marketing information to the user without leaking the related user information of the user.

**[0005]** To resolve the previous technical problem, embodiments of this specification are implemented as follows:

**[0006]** An embodiment of this specification provides a marketing information sending method, applied to a marketing server, and including: obtaining a marketing information obtaining request of a user, where the marketing information obtaining

request is a request that is generated by a first application based on an operation of the user and that is used to obtain marketing information; sending a marketing information sending prediction instruction for the user to a server of the first application in response to the marketing information obtaining request; receiving a user prediction result fed back by the server of the first application, where the user prediction result is information generated based on related user data of the user at the first application, the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use; and sending target marketing information determined based on the user prediction result to the user, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[0007]** An embodiment of this specification provides a marketing information obtaining method, applied to a server of a first application, and including: sending a marketing information obtaining request of a user to a marketing server, where the marketing information obtaining request is a request that is generated by a first application based on an operation of the user and that is used to obtain marketing information; receiving a marketing information sending prediction instruction sent by the marketing server for the user; generating a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction, where the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use; sending the user prediction result to the marketing server; and receiving target marketing information fed back by the marketing server based on the user prediction result, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[0008]** An embodiment of this specification provides a marketing information sending apparatus, applied to a marketing server, and including: an obtaining module, configured to obtain a marketing information obtaining request of a user, where the marketing information obtaining request is a request that is generated by a first application based on an operation of the user and that is used to obtain marketing information; a first sending module, configured to send a marketing information sending prediction instruction for the user to a server of the first application in

response to the marketing information obtaining request; a receiving module, configured to receive a user prediction result fed back by the server of the first application, where the user prediction result is information generated based on related user data of the user at the first application, the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use; and a second sending module, configured to send target marketing information determined based on the user prediction result to the user, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[0009]** An embodiment of this specification provides a marketing information obtaining apparatus, applied to a server of a first application, and including: a first sending module, configured to send a marketing information obtaining request of a user to a marketing server, where the marketing information obtaining request is a request that is generated by the first application based on an operation of the user and that is used to obtain marketing information; a first receiving module, configured to receive a marketing information sending prediction instruction sent by the marketing server for the user; a prediction module, configured to generate a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction, where the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use; a second sending module, configured to send the user prediction result to the marketing server; and a second receiving module, configured to receive target marketing information fed back by the marketing server based on the user prediction result, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[0010]** An embodiment of this specification provides a marketing information sending device, including: at least one processor; and a memory communicatively connected to the at least one processor, where the memory stores instructions that can be executed by the at least one processor, and the instructions are executed by the at least one processor, so that the at least one processor can: obtain a marketing information obtaining request of a user, where the marketing information obtaining request is a request that is generated by a first application based on an operation of the

user and that is used to obtain marketing information; send a marketing information sending prediction instruction for the user to a server of the first application in response to the marketing information obtaining request; receive a user prediction result fed back by the server of the first application, where the user prediction result is information generated based on related user data of the user at the first application, the related user data is information that the device has no permission to use, and the user prediction result is information that the device has permission to use; and send target marketing information determined based on the user prediction result to the user, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[0011]** An embodiment of this specification provides a marketing information obtaining device, including: at least one processor; and a memory communicatively connected to the at least one processor, where the memory stores instructions that can be executed by the at least one processor, and the instructions are executed by the at least one processor, so that the at least one processor can: send a marketing information obtaining request of a user to a marketing server, where the marketing information obtaining request is a request that is generated by a first application based on an operation of the user and that is used to obtain marketing information; receive a marketing information sending prediction instruction sent by the marketing server for the user; generate a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction, where the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use; send the user prediction result to the marketing server; and receive target marketing information fed back by the marketing server based on the user prediction result, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[0012]** At least one embodiment provided in this specification can achieve the following beneficial effects:

**[0013]** When responding to a marketing information obtaining request of a user that is generated by a first application, a marketing server can send a marketing information sending prediction instruction for the user to a server of the first application, so that the server of the first application generates, by using related user

data at the first application that the marketing server has no permission to use, a user prediction result that the marketing server has permission to use. The user prediction result is fed back to the marketing server, so that the marketing server can send, to the user, target marketing information whose predetermined marketing information sending condition determined based on the user prediction result is satisfied, so that a marketing service provider can accurately identify, based on the related user information of the user, whether to send specified marketing information to the user without leaking the related user information of the user at the first application. As such, the accuracy of sending the marketing information is improved, and a problem that a device resource waste exists when the marketing service provider sends the marketing information to a non-audience member can also be alleviated.

### **BRIEF DESCRIPTION OF DRAWINGS**

**[0014]** To describe the technical solutions in embodiments of this specification or in the existing technology more clearly, the following briefly describes the accompanying drawings needed for describing the embodiments or the existing technology. Clearly, the accompanying drawings in the following description merely show some embodiments of this application, and a person of ordinary skill in the art can still derive other drawings from these accompanying drawings without creative efforts.

**[0015]** FIG. 1 is a schematic flowchart of a marketing information sending method according to an embodiment of this specification;

**[0016]** FIG. 2 is a schematic flowchart of a marketing information obtaining method according to an embodiment of this specification;

**[0017]** FIG. 3 is a schematic swimlane flowchart corresponding to marketing information transmission methods in FIG. 1 and FIG. 2 according to an embodiment of this specification;

**[0018]** FIG. 4 is a schematic diagram of a structure of a marketing information sending apparatus corresponding to FIG. 1 according to an embodiment of this specification;

**[0019]** FIG. 5 is a schematic diagram of a structure of a marketing information obtaining apparatus corresponding to FIG. 2 according to an embodiment of this specification;

**[0020]** FIG. 6 is a schematic diagram of a structure of a marketing information

sending device corresponding to FIG. 1 according to an embodiment of this specification; and

[0021] FIG. 7 is a schematic diagram of a structure of a marketing information obtaining device corresponding to FIG. 2 according to an embodiment of this specification.

## **DESCRIPTION OF EMBODIMENTS**

[0022] To make the objectives, technical solutions, and advantages of one or more embodiments of this specification clearer, the following clearly and comprehensively describes the technical solutions of the one or more embodiments of this specification with reference to specific embodiments of this specification and corresponding accompanying drawings. Clearly, the described embodiments are merely some rather than all of the embodiments of this specification. All other embodiments obtained by a person of ordinary skill in the art based on the embodiments of this specification without creative efforts shall fall within the protection scope of one or more embodiments of this specification.

[0023] The following describes in detail the technical solutions in the embodiments of this specification with reference to the accompanying drawings.

[0024] In the existing technology, because marketing information may be used to send interests or red envelopes to users, before pushing marketing information of a merchant to a user, a marketing service provider usually needs to accurately identify whether the user is an audience member of the marketing information of the merchant. Currently, to satisfy requirements on the security and privacy of related user information of users in data management regulations, the marketing service provider usually can only use local response behavior information of the user for historical marketing information to identify whether the user is an audience member of the marketing information of the merchant, but cannot obtain related user information such as an age and a gender of the user at another application, to perform audience identification of the marketing information. Consequently, the accuracy of sending the marketing information is affected.

[0025] To overcome the disadvantages in the existing technology, this solution provides the following embodiments.

[0026] FIG. 1 is a schematic flowchart of a marketing information sending method according to an embodiment of this specification. From a program perspective, the

procedure can be performed by a marketing server of a marketing service provider or an application mounted at the marketing server. As shown in FIG. 1, the procedure can include the following steps.

**[0027]** Step 102: Obtain a marketing information obtaining request of a user, where the marketing information obtaining request is a request that is generated by a first application based on an operation of the user and that is used to obtain marketing information.

**[0028]** In this embodiment of this specification, the user can perform an operation on the first application, so that the first application can generate the marketing information obtaining request of the user, to request to obtain marketing information of a merchant from the marketing server. Specifically, the first application can have a page or an applet used to display marketing information. The user can perform a triggering operation on the page or the applet, so that the first application can generate the marketing information obtaining request of the user after identifying the triggering operation.

**[0029]** For example, the page or the applet of the first application can have a first control used to display offline shopping marketing information and a second control used to display electronic game recharging marketing information, and the user can trigger the first control or the second control, so that the first application can generate a marketing information obtaining request used to request marketing information of a corresponding type. Alternatively, the page or the applet of the first application can have a third control used to display marketing information of a first merchant and a fourth control used to display marketing information of a second merchant, and the user can trigger the third control or the fourth control, so that the first application can generate a marketing information obtaining request or the like used to request marketing information of a corresponding merchant.

**[0030]** In practice, a quantity of pieces of marketing information set by a merchant at the marketing server is usually relatively large, and there may be tens of thousands of pieces of marketing information. Therefore, to reduce device resources, the marketing server can first select a small part of marketing information from all marketing information, to search the small part of marketing information for target marketing information that needs to be sent to the user.

**[0031]** For example, assuming that the marketing information obtaining request of the user is used to request to obtain the offline shopping marketing information, the

target marketing information that needs to be sent to the user can be determined only from the offline shopping marketing information. More specifically, if the marketing information obtaining request of the user carries information about a current location of the user, the target marketing information that needs to be sent to the user can be determined from offline shopping marketing information of merchants whose distances from the current location of the user are less than a predetermined distance. Alternatively, the target marketing information that needs to be sent to the user can be determined from offline shopping marketing information of merchants whose sales ranks are greater than a predetermined value. Alternatively, the target marketing information that needs to be sent to the user can be determined from offline shopping marketing information of merchants whose credit ranks are greater than a predetermined value.

**[0032]** Step 104: Send a marketing information sending prediction instruction for the user to a server of the first application in response to the marketing information obtaining request.

**[0033]** In this embodiment of this specification, the marketing information obtaining request of the user can be generated by the first application based on the operation of the user. Therefore, after obtaining the marketing information obtaining request of the user, the marketing server can usually send the marketing information sending prediction instruction for the user to the server of the first application, to identify whether the user is an audience member of specified marketing information by using related user data of the user at the first application.

**[0034]** Step 106: Receive a user prediction result fed back by the server of the first application, where the user prediction result is information generated based on related user data of the user at the first application, the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use.

**[0035]** In this embodiment of this specification, the related user data of the user at the first application is usually information that the marketing service provider has no permission to use, and the related user data of the user can be data collected or generated by the user in the process of using the first application, for example, information filled in when the user registers a user account with the first application, or user operation behavior data collected when the user uses another function in the first application, or user label data obtained by the first application by analyzing user

data of the user.

**[0036]** In practice, the related user data of the user at the first application can specifically include basic attribute information such as an age, a sex, an identity, and an education degree of the user, and information such as a consumption capability, a behavior characteristic, a social network, a psychological characteristic, a hobby, a credit score, and user label data of the user.

**[0037]** In this embodiment of this specification, the marketing service provider and a service provider of the first application can usually pre-agree on a meaning and a specific generation method of the user prediction result that needs to be fed back to the marketing server by the server of the first application after the server of the first application receives the marketing information sending prediction instruction for the user. The user prediction result is usually data that the marketing server has permission to use and can be used to determine whether the user is an audience member of the specified marketing information. Therefore, the marketing server can determine, based on the user prediction result, whether to send the specified marketing information to the user.

**[0038]** Step 108: Send the target marketing information determined based on the user prediction result to the user, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[0039]** In this embodiment of this specification, the marketing server can usually determine, based on the user prediction result, whether the user satisfies a predetermined marketing information sending condition corresponding to the specified marketing information. If the user satisfies the predetermined marketing information sending condition, the specified marketing information can be determined as marketing information (namely, the target marketing information) that can be sent to the user. However, in consideration of a resource transmission quantity and user experience, target marketing information whose quantity is not greater than a predetermined quantity and whose predetermined marketing information sending condition is satisfied by the user can usually be sent to the user for view.

**[0040]** In the method in FIG. 1, when responding to a marketing information obtaining request of a user that is generated by a first application, a marketing server can send a marketing information sending prediction instruction for the user to a server of the first application, so that the server of the first application generates, by

using related user data at the first application that the marketing server has no permission to use, a user prediction result that the marketing server has permission to use. The user prediction result is fed back to the marketing server, so that the marketing server can send, to the user, target marketing information whose predetermined marketing information sending condition determined based on the user prediction result is satisfied, so that a marketing service provider can accurately identify, based on the related user information of the user, whether to send specified marketing information to the user without leaking the related user information of the user at the first application. As such, the accuracy of sending the marketing information is improved, and a problem that a device resource waste exists when the marketing service provider sends the marketing information to a non-audience member can also be alleviated.

**[0041]** Based on the method in FIG. 1, this embodiment of this specification further provides some specific implementation solutions of the method, which are described below.

**[0042]** In this embodiment of this specification, a merchant usually needs to pre-use a second application to configure marketing information that needs to be pushed to the user.

**[0043]** Based on this, before the obtaining a marketing information obtaining request of a user in step 102, the method can further include:

obtaining a marketing information sending configuration request of a merchant, where the marketing information sending configuration request is a request that is generated by the second application based on an operation of the merchant and that is used to perform sending configuration for specified marketing information, and the marketing information sending configuration request carries sending condition data of the specified marketing information; and the sending condition data includes target label data selected by the merchant from predetermined label data provided by the marketing server; and

setting a predetermined marketing information sending condition of the specified marketing information based on the sending condition data.

**[0044]** In this embodiment of this specification, the merchant can perform an operation on the second application, so that the second application can generate the marketing information sending configuration request of the merchant, to request the marketing server to configure specific content and a sending condition of the specified

marketing information of the merchant. In practice, the specified marketing information of the merchant can be information used to describe a marketing activity of the merchant, or can be information used to receive a payment resource (for example, a red envelope or a coupon) sent in the marketing activity.

**[0045]** Specifically, the second application can have a page or an applet used to configure marketing information. The user can perform a triggering operation on the page or the applet, so that the second application can generate the marketing information sending configuration request of the merchant after identifying the triggering operation. For example, the page or the applet of the second application can display a fifth control used to fill in specific content of the specified marketing information, and the merchant can enter, by using the fifth control, a merchant name, a marketing activity name, content of the marketing activity, information about a payment resource that can be sent in the marketing activity, and the like. The page or the applet of the second application can further display a sixth control used to set a marketing information sending condition, and the merchant can enter or select, by using the sixth control, "by household" as the sending condition of the specified marketing information. Therefore, the second application can generate the marketing information sending configuration request of the merchant.

**[0046]** In practice, the marketing server can usually generate a plurality of pieces of predetermined label data based on a requirement of the merchant, so that the merchant can use the plurality of pieces of predetermined label data when setting the predetermined marketing information sending condition of the specified marketing information. Specifically, target label data selected by the merchant from all pieces of predetermined label data for the specified marketing information can be used as sending condition data of the specified marketing information, and further, the predetermined marketing information sending condition of the specified marketing information can be further set based on the target label data.

**[0047]** For example, the predetermined label data can include "highly active user", "moderately active user", "lowly active user", "high-confidence user", "low-confidence user", "level-1 user", "level-2 user", and "level-3 user". Predetermined label data such as "highly active user", "moderately active user", and "lowly active user" can be used to reflect different frequency of using an application or processing a service by the user. Predetermined label data such as "high-confidence user" and "low-confidence user" can be used to reflect a performance capability or a

performance probability of the user. "Level-1 user", "level-2 user", and "level-3 user" can be used to reflect different user levels determined based on registration duration, amounts of transacted services, or other factors.

**[0048]** Based on this, if the merchant needs to send the specified marketing information to a person who belongs to both "highly active user" and "high-confidence user", two pieces of predetermined label data "highly active user" and "high-confidence user" can be selected. Correspondingly, the sending condition data of the specified marketing information can include two pieces of target label data "highly active user" and "high-confidence user". The predetermined marketing information sending condition of the specified marketing information can be that the user has two pieces of target label data "highly active user" and "high-confidence user".

**[0049]** In practice, as mobile payment is globally prevailing, to better resolve a cross-border payment requirement, a payment and marketing network is usually established based on a payment application and an acquiring platform, so that the user can use, by using the payment and marketing network, the first application in a first country to pay the merchant in a second country, and the user can use the first application in the first country to view marketing information of the merchant, thereby improving experience of the user and the merchant.

**[0050]** Based on this, the first application used by the user can be the payment application, and the second application used by the merchant can be the acquiring platform or a client corresponding to the marketing server. The acquiring platform can be configured to process a payment order of transferring a payment resource to the merchant by the user by using the first application. The marketing server can be a device for managing marketing information in the payment and marketing network established based on the payment application and the acquiring platform, and the marketing server usually establishes communication connections to the server of the first application and the acquiring platform. The client corresponding to the marketing server can be in an APP form or can be in a web application form. This is not specifically limited.

**[0051]** In practice, a service provider of the first application can be a registration service provider in the first country, and the server of the first application is usually also deployed in the first country. The marketing service provider can be a registration service provider in the second country, and the marketing server managed by the

marketing service provider is usually also deployed in the second country. The first country and the second country are usually different countries. Therefore, when data management regulations require that the related user data at the first application cannot be transmitted across a border, the marketing server usually has no permission to use the related user data at the server of the first application.

**[0052]** In addition, a service provider of the second application can be a registration service provider in a third country, and a client or a server of the second application is usually also deployed in the third country. The third country and the first country are usually different countries. The third country and the second country can be different countries or can be the same country. This is not specifically limited.

**[0053]** In this embodiment of this specification, the merchant can set, as the specified marketing information by using the second application, information used to receive a payment resource (for example, a red envelope or a coupon) sent in the marketing activity of the merchant, and send the specified marketing information to the user after the user satisfies the predetermined marketing information sending condition of the specified marketing information, so that a user who is not an audience member can be prevented from receiving the payment resource sent in the marketing activity of the merchant, thereby avoiding a payment resource waste of the merchant.

**[0054]** The merchant can set, as the specified marketing information by using the second application, information used to describe the marketing activity of the merchant, and send the specified marketing information to the user after the user satisfies the predetermined marketing information sending condition of the specified marketing information, to avoid a problem of a device resource waste caused by pushing the marketing information to a large quantity of users who are not audience members.

**[0055]** In this embodiment of this specification, there can be a plurality of marketing information sending prediction instructions for the user, and the user prediction result generated by the server of the first application in response to the marketing information sending prediction instruction can also have a plurality of meanings and usage. This is explained for ease of understanding.

**[0056]** Embodiment 1: Label matching can be performed by using the server of the first application, to identify whether the user is an audience member of the specified marketing information.

**[0057]** Specifically, the sending a marketing information sending prediction

instruction for the user to a server of the first application in step 104 can specifically include:

sending a label matching instruction for the user and the specified marketing information to the server of the first application, where the label matching instruction carries the target label data selected by the merchant for the specified marketing information.

**[0058]** The receiving a user prediction result fed back by the server of the first application in step 106 can specifically include:

receiving the user prediction result generated by the server of the first application through label matching, where the user prediction result is used to reflect a matching result between user label data of the user at the first application and the target label data, the user label data is label data generated based on the related user data of the user at the first application, and the user label data is information that the marketing server has no permission to use.

**[0059]** The sending the target marketing information determined based on the user prediction result to the user in step 108 can specifically include:

if the user prediction result reflects that the user label data of the user matches the target label data, sending the specified marketing information to the user.

**[0060]** In this embodiment of this specification, the marketing server can provide the predetermined label data for the merchant to use, so that the merchant sets predetermined label data required by an audience member of each piece of specified marketing information. The server of the first application can also determine the user label data of the user at the first application based on the related user data of the user. Therefore, the server of the first application can pre-establish a correspondence between each piece of user label data and each piece of predetermined label data.

**[0061]** Based on this, the marketing information sending prediction instruction for the user can be a label matching instruction for the user and the specified marketing information, and can be specifically used to instruct the server of the first application to perform, based on the previous correspondence, matching on the user label data of the user and the target label data selected by the merchant from the predetermined label data for the specified marketing information.

**[0062]** Correspondingly, the user prediction result fed back by the server of the first application in response to the marketing information sending prediction instruction can be used to reflect the matching result between the user label data of the user at the

first application and the target label data. For example, assuming that the user has user label data corresponding to certain target label data, it can indicate that the target label data is successfully matched. In practice, the user prediction result can reflect whether all target label data corresponding to the specified marketing information is successfully matched, or the user prediction result can reflect successfully matched target label data corresponding to the specified marketing information, or the user prediction result can reflect unsuccessfully matched target label data corresponding to the specified marketing information. Therefore, the marketing server can determine whether the user satisfies the predetermined marketing information sending condition of the specified marketing information based on the user prediction result, to finally determine the target marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[0063]** In practice, only after all the target label data corresponding to the specified marketing information is successfully matched, can it indicate that the user satisfies the predetermined marketing information sending condition of the specified marketing information, in other words, the user is an audience member of the specified marketing information. Alternatively, after a proportion of successfully matched target label data corresponding to the specified marketing information is greater than a predetermined threshold, it can indicate that the user satisfies the predetermined marketing information sending condition of the specified marketing information, in other words, the user is an audience member of the specified marketing information.

**[0064]** Based on this, after generating the matching result between the user label data of the user at the first application and the target label data, the server of the first application can further determine whether the user satisfies the predetermined marketing information sending condition of the specified marketing information based on the matching result. If yes, the user prediction result that is fed back can carry only identification information (for example, an ID or a name of the specified marketing information or the marketing activity that the specified marketing information belongs) of the specified marketing information, so that the marketing server can directly use, as the target marketing information whose predetermined marketing information sending condition is satisfied by the user, the marketing information corresponding to the identification information carried in the user prediction result.

**[0065]** It should be noted that the label matching instruction for the user and the specified marketing information can carry target label data respectively corresponding

to a plurality of pieces of specified marketing information, so that the service provider of the first application can be controlled, by using a single label matching instruction, to feed back matching results between the user label data of the user and the target label data respectively corresponding to the plurality of pieces of specified marketing information, so that the marketing server can determine, from the plurality of pieces of specified marketing information, one or more pieces of target marketing information that need to be sent to the user. The label matching instruction does not need to be sent once for each piece of specified marketing information, so that device resources of the marketing server and the server of the first application are reduced.

**[0066]** In this embodiment of this specification, an implementation in which the server of the first application establishes the correspondence between each piece of user label data provided by the server of the first application and each piece of predetermined label data provided by the marketing server is further provided.

**[0067]** Specifically, before the receiving a user prediction result generated by the server of the first application through label matching, the method can further include:

sending, to the server of the first application, each piece of predetermined label data and label description information of each piece of predetermined label data that are provided by the marketing server, where the server of the first application is configured to establish the correspondence between each piece of predetermined label data and each piece of user label data at the first application based on the label description information, and the correspondence is used to generate the user prediction result.

**[0068]** In this embodiment of this specification, the marketing server usually needs to design each piece of predetermined label data based on each predetermined condition. If the user has certain predetermined label data, it can usually indicate that the user satisfies a predetermined condition corresponding to the predetermined label data. Therefore, information that reflects the predetermined condition corresponding to the predetermined label data can be used as label description information of the predetermined label data, so that other people understand the meaning of the predetermined label data based on the label description information.

**[0069]** For ease of understanding, the label description information is described by using an example. Assuming that a predetermined condition corresponding to the predetermined label data "high-confidence user" is that a default probability of the user is less than 10%, label description information of the predetermined label data

can reflect the information that the default probability of the user is less than 10%. Assuming that a predetermined condition corresponding to the predetermined label data "low-confidence user" can be that a default probability of the user is greater than or equal to 10%, similarly, label description information of the predetermined label data can reflect the information that the default probability of the user is greater than or equal to 10%. In practice, the label description information can be further used to indicate to use a default probability value of the user in the last half year or a default probability value of the user in a specified type of service (for example, shopping or credit), to identify whether the user has the predetermined label data.

**[0070]** In this embodiment of this specification, the server of the first application usually also needs to design each piece of user label data based on each specified condition. If the user has certain user label data, it can usually indicate that the user satisfies a specified condition corresponding to the predetermined label data. For example, the user label data at the server of the first application includes "level-3A user", "level-2A" user, and "level-A user", where a specified condition corresponding to "level-3A user" can be that a default probability of the user in the last half year is less than 5%, a specified condition corresponding to "level-2A user" can be that a default probability of the user in the last half year is greater than or equal to 5% and less than 10%, and a specified condition corresponding to "level-A user" can be that a default probability of the user in the last half year is greater than or equal to 10%.

**[0071]** Based on the previous example, when establishing the correspondence between each piece of user label data and each piece of predetermined label data, the server of the first application can establish a correspondence between both "level-3A user" and "level-2A user" and "high-confidence user" and a correspondence between "level-A user" and "low-confidence user" based on the label description information of "high-confidence user" and "low-confidence user". Based on the previous correspondences, if the user has user label data such as "level-3A user" or "level-2A user" at the first application, it can be determined that the user has the predetermined label data "high-confidence user". Similarly, if the user has the user label data "level-A user" at the first application, it can be determined that the user has the predetermined label data "low-confidence user".

**[0072]** Embodiment 2: Model prediction can be performed by using the server of the first application and the marketing server, to identify whether the user is an audience member of the specified marketing information.

**[0073]** Specifically, the sending a marketing information sending prediction instruction for the user to a server of the first application in step 104 can specifically include:

    sending a secure computation instruction for the user to the server of the first application, where the secure computation instruction is used to instruct to generate the user prediction result based on the related user data of the user at the first application by using a first trusted prediction model deployed at the server of the first application.

**[0074]** In this embodiment of this specification, the first trusted prediction model can be established by using a machine learning algorithm, and the related user data and/or the user label data of the user at the first application are/is input into the prediction model, to automatically generate feature data that needs to be used to identify whether the user is an audience member of the specified marketing information, or automatically generate an identification result that reflects whether the user is an audience member of the specified marketing information.

**[0075]** Specifically, to prevent a result output by the first trusted prediction model from being tampered with, a trusted execution environment (TEE) can be deployed in a virtual machine at the server of the first application, and the first trusted prediction model is deployed and run in the trusted execution environment, so that the first trusted prediction model and the prediction result output by the first trusted prediction model are characterized by tamperproofing. As such, the credibility of the user prediction result output by the first trusted prediction model is ensured, and it can be further accurately identified, based on the user prediction result, whether to send the specified marketing information to the user, so that the accuracy of sending the marketing information is improved.

**[0076]** In this embodiment of this specification, the output result of the first trusted prediction model can have a plurality of meanings and usage.

**[0077]** When the first trusted prediction model generates the feature data that needs to be used to identify whether the user is an audience member of the specified marketing information, the sending a secure computation instruction for the user to the server of the first application can specifically include:

    sending a first secure computation instruction for the user to the server of the first application, where the first secure computation instruction is used to instruct to generate anonymous user feature data of the user based on the related user data of

the user at the first application by using the first trusted prediction model deployed at the server of the first application.

**[0078]** The receiving a user prediction result fed back by the server of the first application in step 106 can specifically include:

receiving the anonymous user feature data of the user that is fed back by the server of the first application.

**[0079]** The sending the target marketing information determined based on the user prediction result to the user in step 108 can specifically include:

generating a prediction result for the predetermined label data of the user based on the anonymous user feature data of the user by using a second trusted prediction model deployed at the marketing server; and if it is determined, based on the prediction result, that the predetermined label data of the user matches the target label data, sending the specified marketing information to the user.

**[0080]** In this embodiment of this specification, the anonymous user feature data of the user can be generated based on the related user data of the user at the first application by using the first trusted prediction model deployed at the server of the first application. The anonymous user feature data of the user can usually be input feature data of the second trusted prediction model at the marketing server. In practice, the input feature data of the second trusted prediction model can further include operation behavior data of the user for historical marketing information at the marketing server, for example, operation behavior data such as an ignoring operation, a browsing operation, an account registration operation, and a payment operation. Therefore, the prediction result for the predetermined label data of the user can be generated by using the second trusted prediction model with reference to input feature data provided by a plurality of parties.

**[0081]** In addition, because the predetermined marketing information sending condition of the specified marketing information can be that the user has the target label data selected by the merchant for the specified marketing information, if it is determined that the user has the target label data based on the prediction result generated by the second trusted prediction model for the predetermined label data of the user, it can indicate that the user satisfies the predetermined marketing information sending condition of the specified marketing information, in other words, it can indicate that the user is an audience member of the specified marketing information, and therefore, the specified marketing information can be sent to the user.

**[0082]** In this embodiment of this specification, the anonymous user feature data is usually data that the marketing server has permission to use and that does not leak privacy information of the user, and the marketing server usually cannot obtain sensitive information and the privacy information of the user by performing reverse derivation on the anonymous user feature data, so that requirements on the security and privacy of the user data in the data management regulations can be satisfied.

**[0083]** In practice, a type of the anonymous user feature data can be determined based on an actual requirement, and the anonymous user feature data can be either legible feature data, or can be an illegible black-box feature. This is not specifically limited here. For example, the anonymous user feature data can be predicted legible feature data such as a user credit score or a user default probability, so that the anonymous user feature data can be used to determine whether the user has predetermined label data such as "high-confidence user" or "low-confidence user". In this case, the first trusted prediction model and the second trusted prediction model are usually different complete models established by using the machine learning algorithm. If the anonymous user feature data is an illegible black-box feature, the first trusted prediction model and the second trusted prediction model can be sub-models obtained by splitting a single complete model established by using the machine learning algorithm, the first trusted prediction model can be the first half model including an input layer, and the second trusted prediction model can be the last half model including an output layer.

**[0084]** In practice, a secure multi-party computation technology can be used to identify whether the user is an audience member of the specified marketing information. Specifically, a hardware device or a virtual device where the first trusted prediction model is deployed at the server of the first application can be used as a multi-party secure computation node, and a hardware device or a virtual device where the second trusted prediction model is deployed at the marketing server can be used as another multi-party secure computation node, to determine whether to send the specified marketing information to the user by running and invoking a plurality of multi-party secure computation nodes.

**[0085]** In this embodiment of this specification, when the first trusted prediction model generates the prediction result that reflects the predetermined label data of the user, the sending a secure computation instruction for the user to the server of the first application can specifically include:

sending a second secure computation instruction for the user to the server of the first application, where the second secure computation instruction is used to instruct to generate a prediction result for the predetermined label data of the user based on the related user data of the user at the first application by using the first trusted prediction model deployed at the server of the first application.

**[0086]** The receiving a user prediction result fed back by the server of the first application in step 106 can specifically include:

receiving the prediction result fed back by the server of the first application.

**[0087]** The sending the target marketing information determined based on the user prediction result to the user in step 108 can specifically include:

if it is determined, based on the prediction result, that the predetermined label data of the user matches the target label data, sending the specified marketing information to the user.

**[0088]** In this embodiment of this specification, the first trusted prediction model can also be directly used to predict whether the user has any piece of predetermined label data. Based on this, the prediction result that reflects the predetermined label data of the user can be generated based on the related user data of the user at the first application by using one or more first trusted prediction models deployed at the server of the first application. Therefore, the marketing server can determine, based on the prediction result, whether the user has the target label data selected by the merchant for the specified marketing information. If yes, it can indicate that the user satisfies the predetermined marketing information sending condition of the specified marketing information, in other words, it can indicate that the user is an audience member of the specified marketing information, and therefore, the specified marketing information can be sent to the user. In this embodiment, because the server of the first application does not need to feed back sensitive information of the user to the marketing server, requirements on the security and privacy of user data in the data management regulations can also be satisfied.

**[0089]** In this embodiment of this specification, the solution in Embodiment 1 is characterized by low costs because a multi-party secure computing node does not need to be deployed. Because the solution relies on establishing the correspondence between the predetermined label data at the marketing server and the user label data at the first application, and in addition, logic for selecting a marketing information audience member also needs to be implemented by the server of the first application,

the solution relies on a circling capability on the side of the server of the first application. In the solution in Embodiment 2, a multi-party secure computing node needs to be deployed, and costs are relatively high. However, because logic for selecting a marketing information audience member can be implemented on the side of the marketing server, the solution may not need to rely on a circling capability on the side of the server of the first application. Therefore, the solution in Embodiment 1 or Embodiment 2 can be selected based on an actual requirement, to identify whether the user is an audience member of the marketing information and to accurately send the marketing information to the user.

**[0090]** In this embodiment of this specification, a method for deploying the first trusted prediction model at the server of the first application is further provided.

**[0091]** Specifically, before the sending a secure computation instruction for the user to the server of the first application, the method can further include:

sending a deployment instruction for the first trusted prediction model to the server of the first application, where the deployment instruction is used to instruct to train the first trusted prediction model by using user sample data at the first application in a trusted execution environment and store a trained first trusted prediction model in the trusted execution environment.

**[0092]** In this embodiment of this specification, the deployment instruction for the first trusted prediction model can carry a secure computation program. When the secure computation program runs in the trusted execution environment at the server of the first application, a training task for the first trusted prediction model can be executed. After the secure computation instruction for the user is subsequently received, the user prediction result corresponding to the user can be generated by using the trained first trusted prediction model, and the user prediction result is fed back to the marketing server.

**[0093]** Specifically, an initial model of the first trusted prediction model can be provided by the marketing server, and the initial model of the first trusted prediction model can be at least one of a gradient boosting-based iterative decision tree model, a lightweight gradient boosting machine model, a random forest model, a support vector machine model, or the like.

**[0094]** In the process of executing the training task for the first trusted prediction model, a training sample can be constructed by using the related user data and/or the user label data at the first application, and label data corresponding to the training

sample can be determined based on an actual requirement, so that the initial model of the first trusted prediction model is trained by using the user training sample that carries the label data, to obtain the trained first trusted prediction model. When the label data corresponding to the training sample is anonymous feature data of a sample user, the trained first trusted prediction model can usually be used to generate a user prediction result that reflects the anonymous feature data of the user. When the label data corresponding to the training sample is predetermined label data of a sample user, the trained first trusted prediction model can usually be used to generate a user prediction result that reflects predetermined label data of the user.

**[0095]** Based on the same idea as the solution shown in FIG. 1, an embodiment of this specification further provides a marketing information obtaining method. FIG. 2 is a schematic flowchart of a marketing information obtaining method according to an embodiment of this specification. The procedure can be performed by a server of a first application or an application mounted at the server of the first application. As shown in FIG. 2, the procedure can include the following steps.

**[0096]** Step 202: Send a marketing information obtaining request of a user to a marketing server, where the marketing information obtaining request is a request that is generated by the first application based on an operation of the user and that is used to obtain marketing information.

**[0097]** In this embodiment of this specification, the marketing information obtaining request sent in step 202 is the marketing information obtaining request mentioned in step 102, and details are omitted for simplicity.

**[0098]** Step 204: Receive a marketing information sending prediction instruction sent by the marketing server for the user.

**[0099]** In this embodiment of this specification, the marketing information sending prediction instruction received in step 204 is the marketing information sending prediction instruction mentioned in step 104, and details are omitted for simplicity.

**[00100]** Step 206: Generate a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction, where the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use.

**[00101]** Step 208: Send the user prediction result to the marketing server.

**[00102]** In this embodiment of this specification, the user prediction result sent in

step 208 is the user prediction result mentioned in step 106, and details are omitted for simplicity.

**[00103]** Step 210: Receive target marketing information fed back by the marketing server based on the user prediction result, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[00104]** In this embodiment of this specification, the target marketing information received in step 210 is the target marketing information mentioned in step 108, and details are omitted for simplicity.

**[00105]** In practice, the server of the first application can further send the target marketing information to a client of the first application where a registration account of the user is logged, so that the user views the target marketing information by using the client of the first application, thereby satisfying a requirement of the user for viewing the marketing information.

**[00106]** In the method in FIG. 2, the server of the first application can generate, by using the related user data at the first application that the marketing server has no permission to use, the user prediction result that the marketing server has permission to use, so that the marketing server can feed back the target marketing information whose predetermined marketing information sending condition determined based on the user prediction result is satisfied, and further, the server of the first application can display the target marketing information to the user. In this solution, the marketing server can accurately identify, based on the related user information of the user, whether to send specified marketing information to the user without leaking the related user information at the first application, so that the accuracy of sending the marketing information is improved, and a problem that a device resource waste exists when a marketing service provider sends the marketing information to a user who is not an audience member is also alleviated.

**[00107]** Based on the method in FIG. 2, this embodiment of this specification further provides some specific implementation solutions of the method, which are described below.

**[00108]** In this embodiment of this specification, a predetermined marketing information sending condition of specified marketing information can be determined based on target label data, and the target label data is label data selected, by using a second application, by a merchant from predetermined label data provided by the

marketing server. The specified marketing information can be information used to describe a marketing activity of the merchant, or the specified marketing information can be information used to receive a payment resource sent in the marketing activity.

**[00109]** In this embodiment of this specification, the server of the first application can be deployed in a first country, the marketing server can be deployed in a second country, and the first country and the second country can be different countries. Specifically, the first application can be a payment application, and the second application can be an acquiring platform. The acquiring platform can be configured to process a payment order of transferring a payment resource to the merchant by the user by using the first application. The marketing server can be a device that can communicate with a server of the payment application and the acquiring platform and that is deployed by the marketing service provider.

**[00110]** In this embodiment of this specification, the marketing information sending prediction instruction can be a label matching instruction for the user and the specified marketing information, and the label matching instruction can carry the target label data.

**[00111]** Based on this, the generating a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction in step 206 can specifically include:

**[00112]** performing matching processing on the target label data and user label data of the user based on a correspondence between each piece of predetermined label data and each piece of user label data at the first application, to obtain a user prediction result that reflects a matching result between the target label data and the user label data of the user, where the user label data of the user is determined based on the related user data of the user at the first application, and the user label data of the user is information that the marketing server has no permission to use.

**[00113]** In this embodiment of this specification, an embodiment in which the server of the first application generates the user prediction result that reflects the matching result between the target label data and the user label data of the user can be the same as Embodiment 1 in which label matching is performed by using the server of the first application to identify whether the user is an audience member of the specified marketing information. Details are omitted for simplicity.

**[00114]** In this embodiment of this specification, the marketing information sending prediction instruction can alternatively be a first secure computation instruction for

the user.

**[00115]** Correspondingly, the generating a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction in step 206 can include:

**[00116]** generating anonymous user feature data of the user based on the related user data of the user at the first application by using a first trusted prediction model deployed at the server of the first application, where the anonymous user feature data is used to enable the marketing server to generate a prediction result for the predetermined label data of the user based on a second trusted prediction model.

**[00117]** Alternatively, the marketing information sending prediction instruction can be a second secure computation instruction for the user.

**[00118]** Correspondingly, the generating a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction in step 206 can include:

generating a prediction result for the predetermined label data of the user based on the related user data of the user at the first application by using the first trusted prediction model deployed at the server of the first application.

**[00119]** In this embodiment of this specification, an embodiment in which the server of the first application generates the user prediction result based on the first secure computation instruction or the second secure computation instruction can be the same as Embodiment 2 in which model prediction is performed by using the server of the first application and the marketing server to identify whether the user is an audience member of the specified marketing information in FIG. 1. Details are omitted for simplicity.

**[00120]** In this embodiment of this specification, before the generating a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction in step 206, the method can further include:

obtaining a deployment instruction sent by the marketing server for the first trusted prediction model; and

in response to the deployment instruction, training the first trusted prediction model by using user sample data at the first application in a trusted execution environment, to obtain a trained first trusted prediction model.

**[00121]** In this embodiment of this specification, the deployment process of the first

trusted prediction model has been explained in the embodiment of the solution in FIG. 1. Therefore, details are omitted here for simplicity. References can be made to the content disclosed in the embodiment of the solution in FIG. 1.

**[00122]** FIG. 3 is a schematic swimlane flowchart corresponding to marketing information transmission methods of solutions in FIG. 1 and FIG. 2 according to an embodiment of this specification. As shown in FIG. 3, a marketing information transmission procedure can involve execution bodies such as a user, a server of a first application, a marketing server, and a merchant.

**[00123]** In a marketing information setting phase, the merchant can select, by using a second application, target label data from predetermined label data provided by the marketing server, and use the target label data as sending condition data of specified marketing information. The second application can further send a marketing information sending configuration request that carries the sending condition data of the specified marketing information to the marketing server. After receiving the marketing information sending configuration request, the marketing server can set a predetermined marketing information sending condition of the specified marketing information based on the sending condition data carried in the marketing information sending configuration request, to subsequently identify whether the user is an audience member of the specified marketing information based on the predetermined marketing information sending condition.

**[00124]** In a marketing information sending phase, the user can perform an operation on a client of the first application where a personal registration account is logged, so that the client of the first application can generate a marketing information obtaining request of the user based on the operation of the user, and send the marketing information obtaining request to the server of the first application. After obtaining the marketing information obtaining request of the user, the server of the first application can forward the request to the marketing server for processing.

**[00125]** After obtaining the marketing information obtaining request of the user, the marketing server can generate a marketing information sending prediction instruction for the user, and send the marketing information sending prediction instruction to the server of the first application, so that the server of the first application can generate, based on related user data at the first application that the marketing server has no permission to use, a user prediction result that the marketing server has permission to use, and feed back the user prediction result to the marketing server.

**[00126]** After receiving the user prediction result fed back by the server of the first application, the marketing server can determine, based on the user prediction result, target marketing information whose predetermined marketing information sending condition is satisfied by the user, and send the target marketing information to the server of the first application, so that the server of the first application can forward the target marketing information to the client of the first application where the personal registration account of the user is logged, and therefore, the user can view the target marketing information.

**[00127]** Based on the same idea, an embodiment of this specification further provides an apparatus corresponding to the previous method. FIG. 4 is a schematic diagram of a structure of a marketing information sending apparatus corresponding to FIG. 1 according to an embodiment of this specification. As shown in FIG. 4, the apparatus can be applied to a marketing server, and the apparatus can include:

- an obtaining module 402, configured to obtain a marketing information obtaining request of a user, where the marketing information obtaining request is a request that is generated by a first application based on an operation of the user and that is used to obtain marketing information;

- a first sending module 404, configured to send a marketing information sending prediction instruction for the user to a server of the first application in response to the marketing information obtaining request;

- a receiving module 406, configured to receive a user prediction result fed back by the server of the first application, where the user prediction result is information generated based on related user data of the user at the first application, the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use; and

- a second sending module 408, configured to send target marketing information determined based on the user prediction result to the user, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[00128]** Based on the apparatus in FIG. 4, this embodiment of this specification further provides some specific implementation solutions of the apparatus, which are described below.

**[00129]** Optionally, the apparatus in FIG. 4 can further include:

a sending configuration request obtaining module, configured to obtain a marketing information sending configuration request of a merchant, where the marketing information sending configuration request is a request that is generated by the second application based on an operation of the merchant and that is used to perform sending configuration for specified marketing information, and the marketing information sending configuration request carries sending condition data of the specified marketing information; and

a sending condition setting module, configured to set a predetermined marketing information sending condition of the specified marketing information based on the sending condition data. The sending condition data includes target label data selected by the merchant from predetermined label data provided by the marketing server.

**[00130]** Optionally, the first sending module 404 can be specifically configured to:

send a label matching instruction for the user and the specified marketing information to the server of the first application, where the label matching instruction carries the target label data selected by the merchant for the specified marketing information.

**[00131]** The receiving module 406 can be specifically configured to:

receive the user prediction result generated by the server of the first application through label matching, where the user prediction result is used to reflect a matching result between user label data of the user at the first application and the target label data, the user label data is label data generated based on the related user data of the user at the first application, and the user label data is information that the marketing server has no permission to use.

**[00132]** The second sending module 408 can be specifically configured to:

if the user prediction result reflects that the user label data of the user matches the target label data, send the specified marketing information to the user.

**[00133]** Optionally, the apparatus in FIG. 4 can further include:

a label information sending module, configured to send, to the server of the first application, each piece of predetermined label data and label description information of each piece of predetermined label data that are provided by the marketing server, where the server of the first application is configured to establish a correspondence between each piece of predetermined label data and each piece of user label data at the first application based on the label description information, and

the correspondence is used to generate the user prediction result.

**[00134]** Optionally, the first sending module 404 can be specifically configured to:

send a secure computation instruction for the user to the server of the first application, where the secure computation instruction is used to instruct to generate the user prediction result based on the related user data of the user at the first application by using a first trusted prediction model deployed at the server of the first application.

**[00135]** Optionally, the first sending module 404 can specifically include:

a first sending unit, configured to send a first secure computation instruction for the user to the server of the first application, where the first secure computation instruction is used to instruct to generate anonymous user feature data of the user based on the related user data of the user at the first application by using the first trusted prediction model deployed at the server of the first application.

**[00136]** Correspondingly, the receiving module 406 can be specifically configured to:

receive the anonymous user feature data of the user that is fed back by the server of the first application.

**[00137]** The second sending module 408 can be specifically configured to:

generate a prediction result for the predetermined label data of the user based on the anonymous user feature data of the user by using a second trusted prediction model deployed at the marketing server; and if it is determined, based on the prediction result, that the predetermined label data of the user matches the target label data, send the specified marketing information to the user.

**[00138]** Optionally, the first sending module 404 can specifically include:

send a second secure computation instruction for the user to the server of the first application, where the second secure computation instruction is used to instruct to generate a prediction result for the predetermined label data of the user based on the related user data of the user at the first application by using the first trusted prediction model deployed at the server of the first application.

**[00139]** Correspondingly, the receiving module 406 can be specifically configured to:

receive the prediction result fed back by the server of the first application.

**[00140]** The second sending module 408 can be specifically configured to:

if it is determined, based on the prediction result, that the predetermined

label data of the user matches the target label data, sending the specified marketing information to the user.

**[00141]** Optionally, the apparatus in FIG. 4 can further include:

a model deployment instruction sending module, configured to send a deployment instruction for the first trusted prediction model to the server of the first application, where the deployment instruction is used to instruct to train the first trusted prediction model by using user sample data at the first application in a trusted execution environment and store a trained first trusted prediction model in the trusted execution environment.

**[00142]** Optionally, the server of the first application is deployed in a first country, the marketing server is deployed in a second country, and the first country and the second country are different countries. Specifically, the first application is a payment application, the second application is an acquiring platform, and the acquiring platform is configured to process a payment order of transferring a payment resource to the merchant by the user by using the first application; and the specified marketing information is information used to describe a marketing activity of the merchant, or the specified marketing information is information used to receive a payment resource sent in the marketing activity.

**[00143]** Based on the same idea, an embodiment of this specification further provides an apparatus corresponding to the previous method. FIG. 5 is a schematic diagram of a structure of a marketing information obtaining apparatus corresponding to FIG. 2 according to an embodiment of this specification. As shown in FIG. 5, the apparatus can be applied to a server of a first application, and the apparatus can include:

a first sending module 502, configured to send a marketing information obtaining request of a user to a marketing server, where the marketing information obtaining request is a request that is generated by the first application based on an operation of the user and that is used to obtain marketing information;

a first receiving module 504, configured to receive a marketing information sending prediction instruction sent by the marketing server for the user;

a prediction module 506, configured to generate a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction, where the related user data is information that the marketing server has no permission to use, and the user

prediction result is information that the marketing server has permission to use;

a second sending module 508, configured to send the user prediction result to the marketing server; and

a second receiving module 510, configured to receive target marketing information fed back by the marketing server based on the user prediction result, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[00144]** Based on the apparatus in FIG. 5, this embodiment of this specification further provides some specific implementation solutions of the apparatus, which are described below.

**[00145]** Optionally, predetermined marketing information sending condition of specified marketing information can be determined based on target label data, and the target label data can be label data selected, by using a second application, by a merchant from predetermined label data provided by the marketing server.

**[00146]** Optionally, the marketing information sending prediction instruction can be a label matching instruction for the user and the specified marketing information, and the label matching instruction carries the target label data. Based on this, the prediction module 506 can be specifically configured to:

perform matching processing on the target label data and user label data of the user based on a correspondence between each piece of predetermined label data and each piece of user label data at the first application, to obtain a user prediction result that reflects a matching result between the target label data and the user label data of the user, where the user label data of the user is determined based on the related user data of the user at the first application, and the user label data of the user is information that the marketing server has no permission to use.

**[00147]** Optionally, the marketing information sending prediction instruction can be a first secure computation instruction for the user. Based on this, the prediction module 506 can be specifically configured to:

generate anonymous user feature data of the user based on the related user data of the user at the first application by using a first trusted prediction model deployed at the server of the first application, where the anonymous user feature data is used to enable the marketing server to generate a prediction result for the predetermined label data of the user based on a second trusted prediction model.

**[00148]** Optionally, the marketing information sending prediction instruction can be

a second secure computation instruction for the user. Based on this, the prediction module 506 can be specifically configured to:

generate a prediction result for the predetermined label data of the user based on the related user data of the user at the first application by using the first trusted prediction model deployed at the server of the first application.

**[00149]** Optionally, the apparatus in FIG. 5 can further include:

a deployment instruction obtaining module, configured to obtain a deployment instruction sent by the marketing server for the first trusted prediction model; and

a training module, configured to: in response to the deployment instruction, train the first trusted prediction model by using user sample data at the first application in a trusted execution environment, to obtain a trained first trusted prediction model.

**[00150]** Optionally, the server of the first application is deployed in a first country, the marketing server is deployed in a second country, and the first country and the second country are different countries. The first application is a payment application, the second application is an acquiring platform, and the acquiring platform is configured to process a payment order of transferring a payment resource to the merchant by the user by using the first application; and the specified marketing information is information used to describe a marketing activity of the merchant, or the specified marketing information is information used to receive a payment resource sent in the marketing activity.

**[00151]** Based on the same idea, an embodiment of this specification further provides a device corresponding to the previous method.

**[00152]** FIG. 6 is a schematic diagram of a structure of a marketing information sending device corresponding to FIG. 1 according to an embodiment of this specification. As shown in FIG. 6, a device 600 can include:

at least one processor 610; and

a memory 630 communicatively connected to the at least one processor.

**[00153]** The memory 630 stores instructions 620 that can be executed by the at least one processor 610, and the instructions are executed by the at least one processor 610, so that the at least one processor 610 can:

obtain a marketing information obtaining request of a user, where the marketing information obtaining request is a request that is generated by a first

application based on an operation of the user and that is used to obtain marketing information;

send a marketing information sending prediction instruction for the user to a server of the first application in response to the marketing information obtaining request;

receive a user prediction result fed back by the server of the first application, where the user prediction result is information generated based on related user data of the user at the first application, the related user data is information that the device has no permission to use, and the user prediction result is information that the device has permission to use; and

send target marketing information determined based on the user prediction result to the user, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[00154]** Based on the same idea, an embodiment of this specification further provides a device corresponding to the previous method.

**[00155]** FIG. 7 is a schematic diagram of a structure of a marketing information obtaining device corresponding to FIG. 2 according to an embodiment of this specification. As shown in FIG. 7, a device 700 can include:

at least one processor 710; and

a memory 730 communicatively connected to the at least one processor.

**[00156]** The memory 730 stores instructions 720 that can be executed by the at least one processor 710, and the instructions are executed by the at least one processor 710, so that the at least one processor 710 can:

send a marketing information obtaining request of a user to a marketing server, where the marketing information obtaining request is a request that is generated by a first application based on an operation of the user and that is used to obtain marketing information;

receive a marketing information sending prediction instruction sent by the marketing server for the user;

generate a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction, where the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use;

send the user prediction result to the marketing server; and

receive target marketing information fed back by the marketing server based on the user prediction result, where the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

**[00157]** The embodiments in this specification are described in a progressive way. For same or similar parts of the embodiments, references can be made to the embodiments. Each embodiment focuses on a difference from other embodiments. Particularly, the embodiments of the devices shown in FIG. 6 and FIG. 7 are basically similar to the method embodiment, and therefore are described briefly. For related parts, references can be made to related descriptions in the method embodiment.

**[00158]** In the 1990s, whether a technical improvement is a hardware improvement (for example, an improvement to a circuit structure such as a diode, a transistor, or a switch) or a software improvement (an improvement to a method procedure) can be clearly distinguished. However, as technologies develop, current improvements to many method procedures can be considered as direct improvements to hardware circuit structures. A designer usually programs an improved method procedure into a hardware circuit, to obtain a corresponding hardware circuit structure. Therefore, a method procedure can be improved by using a hardware entity module. For example, a programmable logic device (PLD) (for example, a field programmable gate array (FPGA)) is such an integrated circuit, and a logical function of the PLD is determined by a user through device programming. The designer performs programming to "integrate" a digital system onto a PLD without requesting a chip manufacturer to design and produce an application-specific integrated circuit chip. In addition, at present, instead of manually manufacturing an integrated circuit chip, this type of programming is mostly implemented by using "logic compiler" software. The software is similar to a software compiler used to develop and write a program. Original code needs to be written in a particular programming language for compilation. The language is referred to as a hardware description language (HDL). There are many HDLs such as the Advanced Boolean Expression Language (ABEL), the Altera Hardware Description Language (AHDL), Confluence, the Cornell University Programming Language (CUPL), HDCal, the Java Hardware Description Language (JHDL), Lava, Lola, MyHDL, PALASM, and the Ruby Hardware Description Language (RHDL). The very-high-speed integrated circuit hardware

description language (VHDL) and Verilog are most commonly used. A person skilled in the art should also understand that a hardware circuit that implements a logical method procedure can be readily obtained once the method procedure is logically programmed by using the several described hardware description languages and is programmed into an integrated circuit.

**[00159]** A controller can be implemented by using any appropriate method. For example, the controller can be a microprocessor or a processor, or a computer-readable medium that stores computer readable program code (such as software or firmware) that can be executed by the microprocessor or the processor, a logic gate, a switch, an application-specific integrated circuit (ASIC), a programmable logic controller, or a built-in microprocessor. Examples of the controller include but are not limited to the following microprocessors: ARC 625D, Atmel AT91SAM, Microchip PIC18F26K20, and Silicon Labs C8051F320. The memory controller can also be implemented as a part of the control logic of the memory. A person skilled in the art also knows that, in addition to implementing the controller by using the computer-readable program code, logic programming can be performed on method steps to allow the controller to implement the same function in forms of the logic gate, the switch, the application-specific integrated circuit, the programmable logic controller, and the built-in microcontroller. Therefore, the controller can be considered as a hardware component, and an apparatus configured to implement various functions in the controller can also be considered as a structure in the hardware component. Alternatively, the apparatus configured to implement various functions can even be considered as both a software module implementing the method and a structure in the hardware component.

**[00160]** The system, apparatus, module, or unit illustrated in the previous embodiments can be implemented by using a computer chip or an entity, or can be implemented by using a product having a certain function. A typical implementation device is a computer. Specifically, the computer can be, for example, a personal computer, a laptop computer, a cellular phone, a camera phone, a smartphone, a personal digital assistant, a media player, a navigation device, an emailing device, a game console, a tablet computer, a wearable device, or any combination of these devices.

**[00161]** For ease of description, the previous apparatus is described by dividing functions into various units. Certainly, when this application is implemented, a

function of each unit can be implemented in one or more pieces of software and/or hardware.

**[00162]** A person skilled in the art should understand that an embodiment of the present invention can be provided as a method, a system, or a computer program product. Therefore, the present invention can use a form of hardware only embodiments, software only embodiments, or embodiments with a combination of software and hardware. In addition, the present invention can use a form of a computer program product that is implemented on one or more computer-usable storage media (including but not limited to a magnetic disk memory, a CD-ROM, an optical memory, and the like) that include computer-usable program code.

**[00163]** The present invention is described with reference to the flowcharts and/or block diagrams of the method, the device (system), and the computer program product based on embodiments of this specification. It should be understood that computer program instructions can be used to implement each process and/or each block in the flowcharts and/or the block diagrams and a combination of a process and/or a block in the flowcharts and/or the block diagrams. These computer program instructions can be provided for a general-purpose computer, a special-purpose computer, an embedded processor, or a processor of another programmable data processing device to generate a machine, so that the instructions executed by the computer or the processor of the another programmable data processing device generate an apparatus for implementing a specific function in one or more processes in the flowcharts and/or in one or more blocks in the block diagrams.

**[00164]** These computer program instructions can be stored in a computer-readable memory that can instruct the computer or the another programmable data processing device to work in a specific way, so that the instructions stored in the computer-readable memory generate an artifact that includes an instruction apparatus. The instruction apparatus implements a specific function in one or more processes in the flowcharts and/or in one or more blocks in the block diagrams.

**[00165]** These computer program instructions can be loaded onto the computer or the another programmable data processing device, so that a series of operations and steps are performed on the computer or the another programmable device, thereby generating computer-implemented processing. Therefore, the instructions executed on the computer or the another programmable device provide steps for implementing a specific function in one or more processes in the flowcharts and/or in one or more

blocks in the block diagrams.

**[00166]** In a typical configuration, a computing device includes one or more processors (CPU), an input/output interface, a network interface, and a memory.

**[00167]** The memory can include a form of a volatile memory, a random access memory (RAM) and/or a nonvolatile memory, and the like in a computer-readable medium, such as a read-only memory (ROM) or a flash memory (flash RAM). The memory is an example of the computer-readable medium.

**[00168]** The computer-readable medium includes persistent, non-persistent, movable, and unmovable media that can store information by using any method or technology. The information can be a computer-readable instruction, a data structure, a program module, or other data. An example of the computer storage medium includes but is not limited to a phase change random access memory (PRAM), a static random access memory (SRAM), a dynamic random access memory (DRAM), another type of random access memory (RAM), a read-only memory (ROM), an electrically erasable programmable read-only memory (EEPROM), a flash memory or another memory technology, a compact disc read-only memory (CD-ROM), a digital versatile disc (DVD) or another optical storage, a cassette magnetic tape, a tape and disk storage or another magnetic storage device or any other non-transmission media that can be configured to store information that a computing device can access. Based on the definition in this specification, the computer-readable medium does not include a transitory computer-readable medium, for example, a modulated data signal and carrier.

**[00169]** It should be further noted that the terms "include", "contain", or their any other variants are intended to cover a non-exclusive inclusion, so a process, a method, a product or a device that includes a list of elements not only includes those elements but also includes other elements which are not expressly listed, or further includes elements inherent to such process, method, product or device. Without more constraints, an element preceded by "includes a ..." does not preclude the existence of additional identical elements in the process, method, product, or device that includes the element.

**[00170]** A person skilled in the art should understand that embodiment of this application can be provided as a method, a system, or a computer program product. Therefore, this application can use a form of hardware only embodiments, software only embodiments, or embodiments with a combination of software and hardware. In

addition, this application can use a form of a computer program product that is implemented on one or more computer-usable storage media (including but not limited to a magnetic disk memory, a CD-ROM, an optical memory, and the like) that include computer-usable program code.

**[00171]** This application can be described in the general context of computer-executable instructions, for example, a program module. Generally, the program module includes a routine, a program, an object, a component, a data structure, and the like executing a specific task or implementing a specific abstract data type. This application can alternatively be practiced in a distributed computing environment in which tasks are performed by remote processing devices that are connected through a communications network. In the distributed computing environment, the program module can be located in both local and remote computer storage media including storage devices.

**[00172]** The previous descriptions are merely embodiments of this application, and are not intended to limit the present application. A person skilled in the art can make various modifications and changes to this application. Any modification, equivalent replacement, or improvement made without departing from the spirit and principle of this application shall fall within the scope of the claims in this application.

## CLAIMS

What is claimed is:

1. A marketing information sending method, applied to a marketing server, and comprising:

obtaining a marketing information obtaining request of a user, wherein the marketing information obtaining request is a request that is generated by a first application based on an operation of the user and that is used to obtain marketing information;

sending a marketing information sending prediction instruction for the user to a server of the first application in response to the marketing information obtaining request;

receiving a user prediction result fed back by the server of the first application, wherein the user prediction result is information generated based on related user data of the user at the first application, the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use; and

sending target marketing information determined based on the user prediction result to the user, wherein the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

2. The method according to claim 1, before the obtaining a marketing information obtaining request of a user, further comprising:

obtaining a marketing information sending configuration request of a merchant, wherein the marketing information sending configuration request is a request that is generated by a second application based on an operation of the merchant and that is used to perform sending configuration for specified marketing information, and the marketing information sending configuration request carries sending condition data of the specified marketing information; and

setting a predetermined marketing information sending condition of the specified marketing information based on the sending condition data.

3. The method according to claim 2, wherein the sending condition data comprises target label data selected by the merchant from predetermined label data provided by the marketing server.

4. The method according to claim 3, wherein the sending a marketing

information sending prediction instruction for the user to a server of the first application specifically comprises:

- sending a label matching instruction for the user and the specified marketing information to the server of the first application, wherein the label matching instruction carries the target label data selected by the merchant for the specified marketing information;

- the receiving a user prediction result fed back by the server of the first application specifically comprises:

- receiving the user prediction result generated by the server of the first application through label matching, wherein the user prediction result is used to reflect a matching result between user label data of the user at the first application and the target label data, the user label data is label data generated based on the related user data of the user at the first application, and the user label data is information that the marketing server has no permission to use; and

- the sending target marketing information determined based on the user prediction result to the user specifically comprises:

- if the user prediction result reflects that the user label data of the user matches the target label data, sending the specified marketing information to the user.

5. The method according to claim 4, before the receiving a user prediction result generated by the server of the first application through label matching, further comprising:

- sending, to the server of the first application, each piece of predetermined label data and label description information of each piece of predetermined label data that are provided by the marketing server, wherein the server of the first application is configured to establish a correspondence between each piece of predetermined label data and each piece of user label data at the first application based on the label description information, and the correspondence is used to generate the user prediction result.

6. The method according to claim 3, wherein the sending a marketing information sending prediction instruction for the user to a server of the first application specifically comprises:

- sending a secure computation instruction for the user to the server of the first application, wherein the secure computation instruction is used to instruct to generate the user prediction result based on the related user data of the user at the first

application by using a first trusted prediction model deployed at the server of the first application.

7. The method according to claim 6, wherein the sending a secure computation instruction for the user to the server of the first application specifically comprises:

    sending a first secure computation instruction for the user to the server of the first application, wherein the first secure computation instruction is used to instruct to generate anonymous user feature data of the user based on the related user data of the user at the first application by using the first trusted prediction model deployed at the server of the first application;

    the receiving a user prediction result fed back by the server of the first application specifically comprises:

        receiving the anonymous user feature data of the user that is fed back by the server of the first application; and

        the sending target marketing information determined based on the user prediction result to the user specifically comprises:

            generating a prediction result for the predetermined label data of the user based on the anonymous user feature data of the user by using a second trusted prediction model deployed at the marketing server; and

            if it is determined, based on the prediction result, that the predetermined label data of the user matches the target label data, sending the specified marketing information to the user.

8. The method according to claim 6, wherein the sending a secure computation instruction for the user to the server of the first application specifically comprises:

    sending a second secure computation instruction for the user to the server of the first application, wherein the second secure computation instruction is used to instruct to generate a prediction result for the predetermined label data of the user based on the related user data of the user at the first application by using the first trusted prediction model deployed at the server of the first application;

    the receiving a user prediction result fed back by the server of the first application specifically comprises:

        receiving the prediction result fed back by the server of the first application; and

        the sending target marketing information determined based on the user prediction result to the user specifically comprises:

            if it is determined, based on the prediction result, that the predetermined label

data of the user matches the target label data, sending the specified marketing information to the user.

9. The method according to any one of claims 6 to 8, before the sending a secure computation instruction for the user to the server of the first application, further comprising:

sending a deployment instruction for the first trusted prediction model to the server of the first application, wherein the deployment instruction is used to instruct to train the first trusted prediction model by using user sample data at the first application in a trusted execution environment and store a trained first trusted prediction model in the trusted execution environment.

10. The method according to any one of claims 2 to 8, wherein the server of the first application is deployed in a first country, the marketing server is deployed in a second country, and the first country and the second country are different countries.

11. The method according to claim 10, wherein the first application is a payment application, the second application is an acquiring platform, and the acquiring platform is configured to process a payment order of transferring a payment resource to the merchant by the user by using the first application; and

the specified marketing information is information used to describe a marketing activity of the merchant, or the specified marketing information is information used to receive a payment resource sent in the marketing activity.

12. A marketing information obtaining method, applied to a server of a first application, and comprising:

sending a marketing information obtaining request of a user to a marketing server, wherein the marketing information obtaining request is a request that is generated by the first application based on an operation of the user and that is used to obtain marketing information;

receiving a marketing information sending prediction instruction sent by the marketing server for the user;

generating a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction, wherein the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use;

sending the user prediction result to the marketing server; and

receiving target marketing information fed back by the marketing server based on the user prediction result, wherein the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

13. The method according to claim 12, wherein a predetermined marketing information sending condition of specified marketing information is determined based on target label data, and the target label data is label data selected, by using a second application, by a merchant from predetermined label data provided by the marketing server.

14. The method according to claim 13, wherein the marketing information sending prediction instruction is a label matching instruction for the user and the specified marketing information, and the label matching instruction carries the target label data; and

the generating a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction specifically comprises:

performing matching processing on the target label data and user label data of the user based on a correspondence between each piece of predetermined label data and each piece of user label data at the first application, to obtain a user prediction result that reflects a matching result between the target label data and the user label data of the user, wherein

the user label data of the user is determined based on the related user data of the user at the first application, and the user label data of the user is information that the marketing server has no permission to use.

15. The method according to claim 13, wherein the marketing information sending prediction instruction is a first secure computation instruction for the user; and

the generating a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction specifically comprises:

generating anonymous user feature data of the user based on the related user data of the user at the first application by using a first trusted prediction model deployed at the server of the first application, wherein the anonymous user feature data is used to enable the marketing server to generate a prediction result for the predetermined label

data of the user based on a second trusted prediction model.

16. The method according to claim 13, wherein the marketing information sending prediction instruction is a second secure computation instruction for the user; and

the generating a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction specifically comprises:

generating a prediction result for the predetermined label data of the user based on the related user data of the user at the first application by using the first trusted prediction model deployed at the server of the first application.

17. The method according to claim 15 or 16, before the generating a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction, further comprising:

obtaining a deployment instruction sent by the marketing server for the first trusted prediction model; and

in response to the deployment instruction, training the first trusted prediction model by using user sample data at the first application in a trusted execution environment, to obtain a trained first trusted prediction model.

18. The method according to any one of claims 13 to 17, wherein the server of the first application is deployed in a first country, the marketing server is deployed in a second country, and the first country and the second country are different countries.

19. The method according to claim 18, wherein the first application is a payment application, the second application is an acquiring platform, and the acquiring platform is configured to process a payment order of transferring a payment resource to the merchant by the user by using the first application; and

the specified marketing information is information used to describe a marketing activity of the merchant, or the specified marketing information is information used to receive a payment resource sent in the marketing activity.

20. A marketing information sending apparatus, applied to a marketing server, and comprising:

an obtaining module, configured to obtain a marketing information obtaining request of a user, wherein the marketing information obtaining request is a request that is generated by a first application based on an operation of the user and that is

used to obtain marketing information;

a first sending module, configured to send a marketing information sending prediction instruction for the user to a server of the first application in response to the marketing information obtaining request;

a receiving module, configured to receive a user prediction result fed back by the server of the first application, wherein the user prediction result is information generated based on related user data of the user at the first application, the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use; and

a second sending module, configured to send target marketing information determined based on the user prediction result to the user, wherein the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

21. A marketing information obtaining apparatus, applied to a server of a first application, and comprising:

a first sending module, configured to send a marketing information obtaining request of a user to a marketing server, wherein the marketing information obtaining request is a request that is generated by the first application based on an operation of the user and that is used to obtain marketing information;

a first receiving module, configured to receive a marketing information sending prediction instruction sent by the marketing server for the user;

a prediction module, configured to generate a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction, wherein the related user data is information that the marketing server has no permission to use, and the user prediction result is information that the marketing server has permission to use;

a second sending module, configured to send the user prediction result to the marketing server; and

a second receiving module, configured to receive target marketing information fed back by the marketing server based on the user prediction result, wherein the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

22. A marketing information sending device, comprising:

at least one processor; and

a memory communicatively connected to the at least one processor, wherein the memory stores instructions that can be executed by the at least one processor, and the instructions are executed by the at least one processor, so that the at least one processor can:

obtain a marketing information obtaining request of a user, wherein the marketing information obtaining request is a request that is generated by a first application based on an operation of the user and that is used to obtain marketing information;

send a marketing information sending prediction instruction for the user to a server of the first application in response to the marketing information obtaining request;

receive a user prediction result fed back by the server of the first application, wherein the user prediction result is information generated based on related user data of the user at the first application, the related user data is information that the device has no permission to use, and the user prediction result is information that the device has permission to use; and

send target marketing information determined based on the user prediction result to the user, wherein the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.

23. A marketing information obtaining device, comprising:

at least one processor; and

a memory communicatively connected to the at least one processor, wherein the memory stores instructions that can be executed by the at least one processor, and the instructions are executed by the at least one processor, so that the at least one processor can:

send a marketing information obtaining request of a user to a marketing server, wherein the marketing information obtaining request is a request that is generated by a first application based on an operation of the user and that is used to obtain marketing information;

receive a marketing information sending prediction instruction sent by the marketing server for the user;

generate a user prediction result based on related user data of the user at the first application in response to the marketing information sending prediction instruction, wherein the related user data is information that the marketing server has no

permission to use, and the user prediction result is information that the marketing server has permission to use;

send the user prediction result to the marketing server; and

receive target marketing information fed back by the marketing server based on the user prediction result, wherein the target marketing information is marketing information whose predetermined marketing information sending condition is satisfied by the user.