LOGISTICS STATUS QUERY METHOD AND SYSTEM, AND STORAGE MEDIUM

TECHNICAL FIELD

[0001] This specification relates to the field of artificial intelligence technologies, and in particular, to a logistics status query method and system, and a storage medium.

BACKGROUND

[0002] A logistics status can refer to a current status of cargo (such as an express package and a parcel) in a transportation process, and reflects each phase of the entire logistics chain from shipment to receipt.

[0003] In the related technology, logistics status query mainly adopts two solutions: traversal query and rule query (that is, rule-based query).

[0004] The traversal query refers to separately querying a logistics status in each data source of multiple data sources. Technical problems existing in the traversal query at least include high query costs and low query efficiency. The rule query manner is as follows: A mapping relationship is created and maintained. For example, the mapping relationship can represent a correspondence between a logistics service provider and a data source. For a logistics bill to be queried, a target data source is determined by querying the mapping relationship based on a logistics service provider corresponding to the logistics bill, and a logistics status is queried in the target data source. Technical problems existing in the rule query at least include: The mapping relationship needs to be carefully maintained, which consumes time and labor.

[0005] It is worthwhile to note that, content of the related technology is merely information known to the inventor, and neither means that the information has entered a public domain before an application date of this specification, nor means that the information can become a conventional technology of this specification.

SUMMARY

[0006] This specification provides a logistics status query method and system, and a storage medium, so as to avoid at least one of the above-mentioned technical problems.

[0007] According to a first aspect, this specification provides a logistics status query method, including: obtaining a target logistics bill; determining a logistics feature based on the target logistics bill; determining, by using a pre-trained target model and based on the logistics feature, a target data source used to query a logistics status of the target logistics bill from multiple candidate data sources, where the target model is trained to predict probabilities that the multiple candidate data sources are capable of successfully querying a logistics status of a logistics bill; and performing logistics status query on the target logistics bill in the target data source to obtain the logistics status of the target logistics bill.

[0008] According to a second aspect, this specification provides a logistics status query system, including: at least one storage medium, storing at least one instruction set for querying a logistics status; and at least one processor, communicatively connected to the at least one storage medium, where when running, the at least one processor reads the at least one instruction set, and performs the following operations based on an indication of the at least one instruction set: obtaining a target logistics bill; determining a logistics feature based on the target logistics bill; determining, by using a pre-trained target model and based on the logistics feature, a target data source used to query a logistics status of the target logistics bill from multiple candidate data sources, where the target model is trained to predict probabilities that the multiple candidate data sources are capable of successfully querying a logistics status of a logistics bill; and performing logistics status query on the target logistics bill in the target data source to obtain the logistics status of the target logistics bill.

[0009] According to a third aspect, this specification provides a computer-readable non-transitory storage medium. The computer-readable non-transitory storage medium stores at least one instruction set, and when the at least one instruction set is executed by at least one processor, the method according to the first aspect is implemented.

[0010] It can be learned from the above-mentioned technical solutions that, according to the logistics status query method and system, and the storage medium provided in this specification, a target data source is determined from multiple candidate data sources, and logistics status query

is performed on a target logistics bill in the target data source, so logistics status query does not need to be separately performed in the multiple candidate data sources. Therefore, query resources can be saved, and query efficiency is improved. In addition, the above-mentioned solution does not need to pre-construct and maintain a mapping relationship, thereby avoiding time and resource consumption of constructing and maintaining the mapping relationship. In addition, a target model can adaptively select an appropriate target data source to query a logistics status based on a logistics feature recognized from the target logistics bill, which can increase a probability of query success, and the entire query process can realize query intelligence without human intervention.

[0011] Other functions of the logistics status query method and system, and the storage medium provided in this specification are partially listed in the following descriptions. Creative aspects of the logistics status query method and system, and the storage medium provided in this specification can be fully explained by practice or by using the methods, apparatuses, and combinations described in the following detailed examples.

BRIEF DESCRIPTION OF DRAWINGS

[0012] To describe the technical solutions in the embodiments of this specification more clearly, the following briefly describes the accompanying drawings needed for describing the embodiments. Clearly, the accompanying drawings in the following description show merely some embodiments of this specification, and a person of ordinary skill in the art can still derive other drawings from these accompanying drawings without creative efforts.

[0013] FIG. 1 is a schematic diagram of an application scenario of a logistics status query method according to an embodiment of this specification;

[0014] FIG. 2 is a schematic structural diagram of a logistics status query system according to an embodiment of this specification;

[0015] FIG. 3 is a schematic flowchart of a logistics status query method according to an embodiment of this specification;

[0016] FIG. 4 is a schematic principle diagram of a logistics status query method according to an embodiment of this specification;

[0017] FIG. 5 is a schematic principle diagram of determining a target data source from multiple candidate data sources according to an embodiment of this specification;

[0018] FIG. 6 is a schematic diagram of a group of interaction interfaces according to an embodiment of this specification; and

[0019] FIG. 7 is a schematic diagram of another group of interaction interfaces according to an embodiment of this specification.

DESCRIPTION OF EMBODIMENTS

[0020] Example embodiments are described in detail here, and examples of the example embodiments are presented in the accompanying drawings. When the following description relates to the accompanying drawings, unless specified otherwise, same numbers in different accompanying drawings represent same or similar elements. Implementations described in the following example embodiments do not represent all implementations consistent with this specification. On the contrary, the embodiments are merely examples of apparatuses and methods that are described in the appended claims in details and consistent with some aspects of this specification.

[0021] It should be understood that the terms "include" and "have" in the embodiments of this specification and any variants thereof are intended to cover the non-exclusive inclusion, for example, a product or device that includes a series of components are not necessarily limited to those components that are clearly listed, but can include other components that are not clearly listed or inherent to such product or device.

[0022] In the embodiments of this specification, the term "and/or" describes an association relationship between associated objects and indicates that three relationships can exist. For example, "A and/or B" can indicate the following three cases: Only A exists, both A and B exist, and only B exists. The character "/" generally indicates an "or" relationship between the associated objects.

[0023] In the embodiments of this specification, the term "a multiple" refers to two or more, and other quantifiers are similar to this term.

[0024] The terms "first", "second", "third", etc. in this specification are used to distinguish between similar or same objects or entities, and do not necessarily mean limiting a specific order or sequence, unless otherwise indicated. It should be understood that the terms used in such a way is interchangeable in appropriate cases, for example, can be implemented in an order other than

those illustrated or described in the embodiments of this specification.

[0025] The term "unit/module" used in this specification means any known or later developed hardware, software, firmware, artificial intelligence, fuzzy logic, or a combination of hardware code or/and a combination of software code, and can perform functions related to the element.

[0026] To facilitate readers' understanding of this specification, at least some terms in this specification are explained below:

[0027] A logistics bill refers to a document or a voucher for the entire process of cargo transportation. It contains key information in logistics activities, and ensures data tracking and management in the entire process from a consignor to a consignee. The information in the logistics bill usually includes one or more of a logistics bill number, a consignor address, a consignor, a consignee, a consignee address, a quantity of cargo, a transportation route, and freight charges.

[0028] A logistics service provider is a service provider that provides logistics transportation services.

[0029] Optical character recognition (OCR) refers to a process in which an electronic device (such as a scanner or a digital camera) checks a character printed on a paper, determines a shape of the character by detecting patterns of darkness and lightness, and then translates the shape into a computer text by using a character recognition method.

[0030] A multilayer perceptron (MLP) is an artificial neural network model applicable to multiple machine learning tasks, including classification and regression problems. A basic constituent unit of the MLP is neurons, which are organized into different layers. The MLP usually includes the following layers: (1) an input layer, responsible for receiving raw data. The input layer can include one or more neurons, and each neuron corresponds to one feature of data. (2) An output layer, which generates a final output of a network. A quantity of neurons in the output layer depends on task needs. For example, in a binary classification task, the output layer may have only one neuron. In a multi-classification task, the output layer may have multiple neurons, and each neuron corresponds to one category. (3) A hidden layer, which is located between the input layer and the output layer. There can be one or more hidden layers. Each hidden layer can include several neurons. The neurons weight input signals and generate outputs by using nonlinear activation functions and transfer the outputs to a next layer. The hidden layer is a key to learning and expressing complex patterns by the multilayer perceptron.

[0031] A multi-classification model is a model used to solve a classification problem with

three or more categories in machine learning and statistical classification. The objective of this model is to predict a correct affiliated category of a given data instance from multiple possible categories. Unlike the binary classification models (which distinguish between only two categories, such as yes/no and positive/negative), the multi-classification model processes more complex cases, such as classifying images into different animal categories, classifying e-mails into different spam categories, etc.

[0032] To facilitate readers' understanding of this specification, application scenarios of this specification are described.

[0033] The technical solution provided in this specification is applicable to a scenario in which a logistics status of a target logistics bill needs to be queried based on the target logistics bill. For example, the technical solution provided in this specification can be applied to a logistics query scenario, for example, a consignor or a consignee queries a logistics status of an express package. For another example, the technical solution provided in this specification can be further applied to a risk control scenario. For example, when a risk control party needs to verify authenticity of a target transaction, the risk control party can query, based on a logistics bill provided by a transaction participant, a logistics status of a transaction object associated with the target transaction, so as to verify the authenticity of the target transaction.

[0034] The logistics query scenario is used as an example:

[0035] To obtain a logistics status of a logistics bill, a consignor can input the logistics bill into a logistics status query system (hereinafter referred to as the query system) to initiate a query request. Correspondingly, the query system performs the technical solution provided in this specification to obtain and output the logistics status of the logistics bill.

[0036] The risk control scenario is used as an example:

[0037] In some embodiments, a risk control system typically needs to verify authenticity of a transaction to prevent and control a risky transaction. For example, when a transaction participant initiates a transaction request (when a user initiates a payment request or a merchant initiates a payment collection request), the risk control system can require the transaction participant to provide a transaction proof document to prove authenticity of a current transaction, thereby avoiding a risk of compliance or fraud. In the above transaction proof document, a logistics bill is a material that can be queried and verified by using a data source, and is of great significance for transaction authenticity verification. A type of the logistics bill can include but is not limited to a

domestic courier bill, an international courier bill, an ocean bill of lading, an air waybill, a customs declaration form, and a land transportation bill. The risk control system can implement the technical solution provided in this specification to obtain the logistics status of the logistics bill and verify the authenticity of the transaction according to the logistics status of the logistics bill.

[0038] It is worthwhile to note that the above-mentioned examples are merely used to illustrate, by way of example, applicable application scenarios of the technical solution in this specification, and execution bodies that may execute the technical solution provided in this specification in different application scenarios, which should not be construed as a limitation on the application scenario and the execution body. When an example is involved in the following description, a query system is used as an execution body for exemplary description.

[0039] In practice, there are usually multiple data sources available for querying a logistics status. For ease of description, in the following description, the multiple data sources available for querying a logistics status are referred to as multiple candidate data sources. In the related technology, a logistics status query method includes two types: traversal query and rule query (that is, rule-based query).

[0040] The traversal query can be understood as follows: A query system separately queries a logistics status in each candidate data source, that is, separately queries a logistics status of a logistics bill in all candidate data sources to obtain logistics status query results corresponding to the candidate data sources, and combines the logistics status query results to obtain the logistics status of the logistics bill.

[0041] However, the traversal query manner has at least the following disadvantages: On the one hand, traversal needs to be performed on all candidate data sources, and thus query costs are high and query efficiency is low. On the other hand, for a case of a large quantity of candidate data sources, it is difficult to combine logistics status query results corresponding to the candidate data sources.

[0042] The rule query can be understood as: creating and maintaining a mapping relationship. For example, the mapping relationship is used to represent a correspondence between a logistics service provider (or information such as a logistics bill number and shipping time) and a data source. For a logistics bill to be queried, a target data source is determined by querying the mapping relationship based on a logistics service provider corresponding to the logistics bill, and a logistics status of the logistics bill is queried in the target data source.

[0043] However, the rule query manner has at least the following disadvantages: The mapping relationship needs to be carefully maintained, which consumes time and labor.

[0044] It is worthwhile to note that, content of the related technology is merely information known to the inventor, and neither means that the information has entered a public domain before an application date of this specification, nor means that the information can become a conventional technology of this specification.

[0045] Therefore, to avoid at least one of the above-mentioned problems that exist due to traversal query and rule query, this specification proposes a technical concept with creative labors: A target model is pre-trained, and the target model is capable of predicting, based on a logistics features recognized from a logistics bill, probabilities that multiple candidate data sources successfully query a logistics status of the logistics bill. When a logistics status of a target logistics bill needs to be queried, a target data source used to query the logistics status of the target logistics bill is determined from the multiple candidate data sources based on the logistics feature recognized from the target logistics bill by using the target model, and logistics status query is performed on the target logistics bill in the target data source, so as to obtain the logistics status of the target logistics bill.

[0046] Based on the above-mentioned analysis, it can be learned that, in the above-mentioned technical solution, the target data source is determined from the multiple candidate data sources, logistics status query is performed on the target logistics bill in the target data source, and logistics status query does not need to be separately performed in the multiple candidate data sources. Therefore, the above-mentioned solution can save query resources and improve query efficiency. In addition, the above-mentioned solution does not need to pre-construct and maintain a mapping relationship, thereby avoiding time and resource consumption of constructing and maintaining the mapping relationship. In addition, the target model can adaptively select an appropriate target data source to query the logistics status based on the logistics feature recognized from the target logistics bill, which can increase a probability of query success, and the entire process can realize query intelligence without human intervention.

[0047] FIG. 1 is a schematic diagram of an application scenario of a logistics status query method (hereinafter referred to as the query method) according to an embodiment of this specification. The query method in this specification can be applied to a query scenario 100 shown in FIG. 1. As shown in FIG. 1, the query scenario 100 can include a target user 101, a client 102,

a server 103, and a network 104.

[0048] The target user 101 can be a user that triggers query of a logistics status of a target logistics bill. For example, the target user 101 can perform a target operation at the client 102 to trigger query of a logistics status. In some embodiments, the target user 101 can upload the target logistics bill at the client 102 to trigger query of the logistics status. In some embodiments, the target user 101 can input indication information at the client 102 to indicate the target logistics bill to be queried. The indication information can be an identifier of the target logistics bill, etc. In some embodiments, the target user 101 can further be a participant of a target transaction. When initiating the target transaction, the target user 101 uploads a transaction proof document to the client 102 to prove authenticity of the target transaction. The transaction proof document includes the target logistics bill.

[0049] The client 102 can be an electronic device that provides an interaction function for the target user 101. For example, the client 102 can provide an interaction interface for the target user 101, and the target user 101 can perform an interaction operation on the interaction page. In some embodiments, the client 102 performs the query method described in this specification in response to detecting a logistics status query operation triggered by the target user 101. In this case, the client 102 can store data or instructions for performing the query method described in this specification, and can execute or be configured to execute the data or the instructions. In some embodiments, the client 102 can include a hardware device with a data information processing function and a program needed to drive the hardware device to work, so as to perform the query method described in this specification.

[0050] In some embodiments, the client 102 can include a mobile device, a tablet computer, a laptop computer, a device built in a motor vehicle or similar content, or any combination thereof. In some embodiments, the mobile device can include a smart home device, a smart mobile device, a virtual reality device, an augmented reality device or a similar device, or any combination thereof. In some embodiments, the smart home apparatus can include a smart television, a desktop computer, or any combination. In some embodiments, the smart mobile device can include a smartphone, a personal digital assistant, a game device, a navigation device, or any combination thereof. In some embodiments, the apparatus built in the motor vehicle can include a vehicle-mounted computer, a vehicle-mounted television, etc. In some embodiments, the client 102 can include a collection device configured to collect the target logistics bill, such as scanning a paper

version of the target logistics bill or photographing to obtain an electronic version of the target logistics bill.

[0051] In some embodiments, one or more applications (APP) can be installed on the client 102. The APP can provide the target user 101 with a capability and an interface for interacting with the outside through the network 104. The APP includes but is not limited to a web browser APP program, a search APP program, a chat APP program, a shopping APP program, a video APP program, a financial APP program, an instant messaging tool, an email client, social platform software, etc. In some embodiments, a target APP can be installed on the client 102. The target APP can collect the target logistics bill for the client 102.

[0052] As shown in FIG. 1, the client 102 can be communicatively connected to the server 103. The server 103 can communicate with one client 102, or can communicate with multiple clients 102. In some embodiments, the client 102 can interact with the server 103 through the network 104, to receive or send a message, etc. For example, the client 102 can interact with the server 103 by using the network 104 to send the target logistics bill to the server 103.

[0053] The server 103 can be a server that provides various services. For example, the server 103 can be a server that provides a logistics status query service to the client 102 (in this case, the server 103 can be referred to as a query system), a server that provides a transaction service (in this case, the server 103 can be referred to as a transaction server or a transaction system), a server that provides a risk control service, etc. (in this case, the server 103 can be referred to as a risk control server or a risk control system). The server 103 can be a cloud server or a local server. The server 103 can be communicatively connected to one client 102 and receive data sent by the client 102, or can be communicatively connected to multiple clients 102, and receive data sent by each client 102.

[0054] In some embodiments, the query method described in this specification can be performed on the server 103. In this case, the server 103 can store data or instructions for performing the query method described in this specification, and can execute or be configured to execute the data or the instructions. The server 103 can include a hardware device with a data information processing function and a necessary program needed for driving the hardware device to work.

[0055] The network 104 is a medium configured to provide a communication connection between the client 102 and the server 103. The network 104 can facilitate exchange of information

or data. As shown in FIG. 1, the client 102 and the server 103 can be separately connected to the network 104, and transmit information or data to each other through the network 104.

[0056] In some embodiments, the network 104 can be any type of wired or wireless network, or a combination thereof. For example, the network 104 can include a cable network, a wired network, an optical fiber network, a telecommunication network, an intranet, the internet, a local area network (LAN), a wide area network (WAN), a wireless local area network (WLAN), a metropolitan area network (MAN), a public switched telephone network (PSTN), a Bluetooth network™, a short-range wireless network (ZigBee™), a near field communication (NFC) network, or a similar network.

[0057] In some embodiments, the network 104 can include one or more network access points. For example, the network 104 can include a wired or wireless network access point, for example, a base station or an Internet switching point. Through the access point, one or more components of the client 102 and the server 103 can be connected to the network 104 to exchange data or information.

[0058] It is worthwhile to note that quantities of clients 102, servers 103, and networks 104 in FIG. 1 are merely examples. There can be any quantity of clients 102, servers 103, and networks 104 based on implementation needs. In addition, the query method provided in this specification can be completely performed on the client 102, can be completely performed on the server 103, or can be partially performed on the client 102 and partially performed on the server 103.

[0059] In other words, FIG. 1 and the above-mentioned descriptions for FIG. 1 are merely used to describe an example of an application scenario to which the query method in this specification may be applied, and cannot be understood as a limitation on the application scenario.

[0060] FIG. 2 is a diagram of a hardware structure of a query system 200 according to an embodiment of this specification. The query system 200 can perform the query method described in this specification. The query method is described in other parts of this specification. When the query method is performed on the client 102, the query system 200 can be the client 102. When the query method is performed on the server 103, the query system 200 can be the server 103. When the query method can be partially performed on the client 102 and partially performed on the server 103, the query system 200 can be the client 102 and the server 103.

[0061] As shown in FIG. 2, the query system 200 can include at least one storage medium 203 and at least one processor 202. In some embodiments, the query system 200 can further include a

communication port 204 and an internal communication bus 201. The query system 200 can further include an I/O component 205.

[0062] The internal communication bus 201 can be connected to different system components. For example, the internal communication bus 201 can be connected to the storage medium 203, the processor 202, the communication port 204, and the I/O component 205.

[0063] The I/O component 205 supports input/output between the query system 200 and another component.

[0064] The communication port 204 is used for data communication between the query system 200 and the outside. For example, the communication port 204 can be used for data communication between the query system 200 and the network 104. The communication port 204 can be a wired communication port, or can be a wireless communication port.

[0065] The storage medium 203 can include a data storage apparatus. The data storage apparatus can be a non-transitory storage medium, or can be a transitory storage medium. For example, the data storage apparatus can include one or more of a disk 2031, a read-only memory (ROM) 2032, or a random access memory (RAM) 2033. The storage medium 203 further includes at least one instruction set stored in the data storage apparatus. The instruction set includes computer program code. The computer program code can include a program, a routine, an object, a component, a data structure, a process, a module, etc. for performing the query method provided in this specification.

[0066] The at least one processor 202 can be communicatively connected to the at least one storage medium 203. The at least one processor 202 is configured to execute the at least one instruction set. When the query system 200 runs, the at least one processor 202 reads the at least one instruction set and performs, based on an instruction of the at least one instruction set, the query method provided in this specification. The processor 202 can perform all steps included in the query method. The processor 202 can be in a form of one or more processors. In some embodiments, the processor 202 can include one or more hardware processors, for example, a microcontroller, a microprocessor, a reduced instruction set computer (RISC), an application-specific integrated circuit (ASIC), an application-specific instruction set processor (ASIP), a central processing unit (CPU), a graphics processing unit (GPU), a physical processing unit (PPU), a microcontroller unit, a digital signal processor (DSP), a field programmable gate array (FPGA), an advanced RISC machine (ARM), a programmable logic device (PLD), any circuit or processor

that can perform one or more functions, or any combination thereof.

[0067] To merely describe a problem, only one processor 202 is shown in the query system 200 in the accompanying drawings. However, it is worthwhile to note that, the query system 200 in this specification can further include multiple processors. Therefore, the operations and/or method steps disclosed in this specification can be performed by one processor, or can be jointly performed by multiple processors. For example, if the processor 202 in the query system 200 described in this specification performs step A and step B, it should be understood as that step A and step B can be jointly or separately performed by two different processors 202 (for example, a first processor performs step A, and a second processor performs step B, or a first processor and a second processor jointly perform step A and step B).

[0068] Referring to FIG. 3, FIG. 3 is a schematic flowchart of a logistics status query method according to an embodiment of this specification. The query method shown in FIG. 3 can be performed by a query system. For the description of the query system, refer to the above-mentioned example. Details are omitted here for simplicity.

[0069] As shown in FIG. 3, the method includes the following S301 to S304:

[0070] S301: Obtain a target logistics bill.

[0071] For example, the target logistics bill can be understood as a logistics bill to be queried, for example, a logistics bill whose corresponding logistics status needs to be obtained.

[0072] With reference to the above-mentioned example, it can be learned that the query method in this specification can be applied to a logistics query scenario and a risk control scenario. In the logistics query scenario, the target logistics bill can be a logistics bill whose logistics status needs to be queried and that is inputted by a consignor or a consignee into the query system. In the risk control scenario, the target logistics bill can be a logistics bill provided by a participant of a target transaction to prove authenticity of the target transaction.

[0073] A manner in which the query system obtains the target logistics bill is not limited in this embodiment. For example,

in one example, the query system can be connected to another system and receive a target logistics bill sent by the another system.

[0074] For example, the above-mentioned example and the application scenario shown in FIG. 1 are used as examples. The query system can be the server 103 shown in FIG. 1, and the another system can be the client 102 shown in FIG. 1. The target user 101 can input the target logistics bill

on the client 102 in an APP or a non-APP manner, so as to trigger the client 102 to send the target logistics bill to the server 103.

[0075] In another example, the query system can provide a tool for loading the target logistics bill, and the target user 101 can transmit the target logistics bill to the query system by using the tool for loading the target logistics bill.

[0076] The tool for loading the target logistics bill can be an interface used to connect to an external device, for example, an interface used to connect to another storage device, and the target logistics bill transmitted by the external device is obtained by using the interface. The tool for loading the target logistics bill can alternatively be a display apparatus, for example, the query system can output, on the display apparatus, an interface for a function of loading the target logistics bill. The target user can import the target logistics bill to the query system through this interface.

[0077] S302: Determine a logistics feature based on the target logistics bill.

[0078] For example, the logistics feature can be understood as logistics attribute information related to logistics. At least a part of the logistics feature can be determined based on the target logistics bill.

[0079] In some embodiments, the logistics feature can include a logistics bill feature corresponding to the target logistics bill.

[0080] In some embodiments, the logistics bill feature includes at least one of the following: a logistics service provider, time elapsed since shipment, a receiving region, a shipping region, and logistics status query success rates of a logistics bill from the logistics service provider in the multiple candidate data sources.

[0081] The logistics service provider is a logistics service provider of the target logistics bill. The time elapsed since shipment is time between shipping time and current time (such as query time). The shipping region refers to a region in which a shipping place is located, such as a region or a country in which the shipping place is located. The receiving region refers to a region in which a receiving place is located, such as a region or a country in which the receiving place is located.

[0082] A logistics status query success rate of the logistics bill from the logistics service provider in a candidate data source refers to a proportion or a probability that the logistics status can be successfully identified when logistics status query is performed on the logistics bill from the logistics service provider in the candidate data source, and can be determined based on the

ratio of a quantity of successful query times to a total quantity of query times in a specific time period.

[0083] For example, for a candidate data source A, in a specific time period, a total quantity of query times of logistics status query performed on the logistics bill from the logistics service provider in the candidate data source A is X, and a quantity of successful query times is Y. Then, a logistics status query success rate of the logistics bill from the logistics service provider in the candidate data source A can be (Y/X)*100%.

[0084] It can be learned from the above-mentioned description of the logistics bill feature that, in this embodiment, the logistics bill feature can include content of a single dimension, or can include content of multiple dimensions, so the logistics bill feature has diversity and flexibility. In a case that the logistics bill feature includes content of multiple dimensions, the logistics bill feature can fully represent logistics related information of the target logistics bill from different dimensions, so the logistics related information of the target logistics bill can be accurately reflected. Therefore, when the query system determines the target data source with reference to the logistics bill feature in the following, the determined target data source can be adapted to query the target logistics bill, that is, the target data source is a data source that is probably capable of successfully querying the target logistics bill, thereby improving accuracy and reliability of a query result.

[0085] In some embodiments, in a case that the logistics bill feature includes: the logistics service provider, the time elapsed since shipment, the receiving region, the shipping region, and the logistics status query success rates of the logistics bill from the logistics service provider in the multiple candidate data sources, S302 can include the following steps 1 to 3:

[0086] Step 1: Perform text recognition on the target logistics bill to obtain the logistics service provider, the receiving region, the shipping region, and shipping time from the target logistics bill through recognition.

[0087] For example, the query system can recognize the target logistics bill by using a technology such as OCR, to obtain the logistics service provider, the receiving region, the shipping region, and the shipping time.

[0088] Step 2: Determine the time elapsed since shipment according to the shipping time.

[0089] For example, the query system can obtain the shipping time by using the above-mentioned step 1, and determine a difference between current time and the shipping time as the

time elapsed since shipment.

[0090] Step 3: Obtain the logistics status query success rates of the logistics bill from the logistics service provider in the multiple candidate data sources according to historical query data related to the logistics service provider.

[0091] The historical query data can be understood as data in a case that for each candidate data source, the logistics service provider performs logistics status query in the candidate data source in a predetermined historical time period, for example, for the candidate data source A, in the past three months, a quantity of successful query times that the logistics service provider performs logistics status query in the candidate data source A, and a total quantity of query times. A logistics status query success rate of the logistics bill from the logistics service provider in the candidate data source A is calculated according to the quantity of successful query times and the total quantity of query times. For a specific calculation principle, refer to the above-mentioned example. Details are omitted here for simplicity.

[0092] The predetermined time period is not limited in this embodiment. For example, the predetermined time period can be determined by the query system based on needs, a history record, an experiment, etc.

[0093] With reference to the above-mentioned analysis on step 1 to step 3, it can be learned that in this embodiment, the query system can determine the logistics bill feature based on text recognition and simple calculation, so as to improve convenience and efficiency of obtaining the logistics bill feature.

[0094] In some embodiments, in addition to the logistics bill feature corresponding to the target logistics bill, the logistics feature can further include data source features corresponding to the multiple candidate data sources. That is, the logistics feature can include features of two dimensions, where one dimension is a dimension of the target logistics bill, and the other dimension is a dimension of the candidate data source. The data source features include logistics status query success rates respectively corresponding to the multiple candidate data sources.

[0095] A logistics status query success rate corresponding to a candidate data source refers to a proportion or a probability that a logistics status can be successfully identified when logistics status query is performed in the candidate data source, and can be determined based on the ratio of a quantity of successful query times to a total quantity of query times in a specific time period. For example, for any candidate data source A, if a total quantity of times that logistics status query

is performed in the candidate data source A is M times in a predetermined historical time period, and N of the M times are successful query, the logistics status query success rate corresponding to the candidate data source A can be (N/M)*100%.

[0096] Similarly, this embodiment sets no limitation on the predetermined historical time period. For example, the predetermined historical time period can be determined by the query system based on needs, a history record, an experiment, etc.

[0097] In this embodiment, when the logistics feature includes the logistics bill feature and the data source feature, and the query system determines the target data source based on the logistics feature in the following, not only the logistics-related information of the target logistics bill is considered, but also the query success rates corresponding to the multiple candidate data sources are considered, which further ensures that the determined target data source is a data source that is probably capable of successfully querying the target logistics bill, thereby further improving accuracy and reliability of a query result.

[0098] S303: Determine, by using a pre-trained target model and based on the logistics feature, a target data source used to query a logistics status of the target logistics bill from multiple candidate data sources, where the target model is trained to predict probabilities that the multiple candidate data sources are capable of successfully querying a logistics status of a logistics bill.

[0099] For example, for any candidate data source in the multiple candidate data sources, a probability that the candidate data source can successfully query the logistics status of the logistics bill can be understood as a possibility that the candidate data source can successfully query the logistics status of the logistics bill.

[0100] It is worthwhile to note that the target model is a pre-trained machine learning model, and has a capability of predicting probabilities that the multiple candidate data sources successfully query a logistics status of a logistics bill. For example, the target model can predict the probabilities that the multiple candidate data sources successfully query the logistics status of the target logistics bill. Therefore, the query system can select, from the multiple candidate data sources by using the target model, a data source (that is, the target data source) suitable for querying the target logistics bill.

[0101] In some embodiments, the target model can be trained by the query system, or can be trained by another system (for example, a training system), which is not limited in this embodiment.

[0102] If the target model is trained by the training system, there is a communication link

between the query system and the training system. The training system can transmit the target model to the query system based on the communication link. The query system stores the target model. When the query system needs to query the logistics status of the target logistics bill, the target model is invoked to determine the data source used to query the target logistics bill.

[0103] Similarly, a network model, a framework, etc. of the target model are not limited in this embodiment, and can be determined by the query system based on needs, a history record, an experiment, etc. For example, the target model can be an MLP-based multi-classification model.

[0104] In some embodiments, S303 can include the following steps 1 and 2:

[0105] Step 1: Input the logistics feature into the target model to obtain target probabilities that the multiple candidate data sources are capable of successfully querying the logistics status of the target logistics bill.

[0106] With reference to the above-mentioned analysis, it can be learned that a target probability corresponding to any candidate data source can be understood as a possibility that a logistics status of a target logistics bill can be successfully identified by using the candidate data source.

[0107] For example, as shown in FIG. 4, there are five candidate data sources, which are marked as a data source 1 to a data source 5. After determining the logistics feature based on the target logistics bill, the query system can input the logistics feature into the target model. The target model predicts and outputs five target probabilities, which are marked as a target probability p1 to a target probability p5. One candidate data source is corresponding to one target probability. As shown in FIG. 4, a target probability corresponding to the data source 1 is the target probability p1, and so on.

[0108] Step 2: Determine the target data source from the multiple candidate data sources according to the target probabilities respectively corresponding to the multiple candidate data sources.

[0109] For example, with reference to the above-mentioned example and FIG. 4, the query system determines, according to the five target probabilities, that the target data source is the data source 3 from the five candidate data sources, so as to query the logistics status of the target logistics bill in the data source 3 to obtain the logistics status of the target logistics bill.

[0110] With reference to the above-mentioned example, it can be learned that the target probability represents a possibility that the candidate data source successfully queries the logistics

status of the target logistics bill. Therefore, based on the target probabilities respectively corresponding to the multiple candidate data sources, the target data source suitable for querying the target logistics bill can be determined from the multiple candidate data sources more accurately.

[0111] In some embodiments, step 2 can include: determining a candidate data source corresponding to a maximum probability in the target probabilities respectively corresponding to the multiple candidate data sources as the target data source.

[0112] With reference to the above-mentioned example, the target probability represents a possibility of successfully querying the logistics status of the target logistics bill. Therefore, a candidate data source corresponding to a maximum probability is a candidate data source that is most likely to successfully query the logistics status of the target logistics bill.

[0113] Correspondingly, the query system determines the candidate data source that is most likely to successfully query the logistics status of the target logistics bill as the target data source. That is, the target data source is the candidate data source, in the multiple candidate data sources, that is most likely to successfully query the logistics status of the target logistics bill. Therefore, a query success rate and reliability can be improved.

[0114] In some other embodiments, step 2 can include the following sub-steps 1 and 2:

[0115] Sub-step 1: Determine at least two data sources to be selected from the multiple candidate data sources, where the target probabilities corresponding to the data sources to be selected are greater than or equal to a predetermined threshold.

[0116] Similarly, the predetermined threshold is not limited in this embodiment, and can be determined by the query system based on needs, a history record, an experiment, etc.

[0117] With reference to the above-mentioned example and FIG. 5, the target probability of the data source 1 is 85%, the target probability of the data source 2 is 70%, the target probability of the data source 3 is 83%, the target probability of the data source 4 is 75%, the target probability of the data source 5 is 95%, and the predetermined threshold can be 80%. The query system can separately compare the five target probabilities with 80% to determine a target probability reaching 80% from the five target probabilities, and call a candidate data source whose target probability reaches 80% as a data source to be selected. For example, three data sources to be selected shown in FIG. 5 are obtained.

[0118] Sub-step 2: Obtain query costs respectively corresponding to the at least two data sources to be selected, and determine a data source to be selected whose corresponding query cost

is the minimum as the target data source.

[0119] The query cost can include a cost of a time dimension, a cost of an expense dimension, etc.

[0120] Still referring to the above-mentioned example, the query system can obtain query costs respectively corresponding to three candidate data sources, to obtain three query costs shown in FIG. 5, which are marked as a query cost x1 to a query cost x3.

[0121] Correspondingly, the query system compares the three query costs to determine the minimum query cost from the three query costs. If the query cost x2 is less than the query cost x1 and less than the query cost x3, as shown in FIG. 5, the query system determines that the minimum query cost of the three query costs is the query cost x2, and determines the candidate data source 3 corresponding to the query cost x2 as the target data source.

[0122] With reference to the above-mentioned analysis for sub-step 1 and sub-step 2, it can be learned that in this embodiment, the query system filters the multiple candidate data sources by using the predetermined threshold, so as to select multiple data sources to be selected with relatively high query success probabilities. The query system further filters the multiple data sources to be selected by using query costs to select a data source to be selected with a relatively low query cost as the target data source. That is, when determining the target data source, the query system considers both the query success probability and the query cost. Therefore, in a case that it is ensured that the query success probability is relatively high, the query cost can be reduced.

[0123] It can be learned from the above-mentioned analysis that the target model can be trained by the query system or the training system. In this specification, a training process of the target model is described by using an example in which the query system trains the target model.

[0124] For example, in some embodiments, the target model is obtained by training multiple training samples, one training sample includes a logistics feature corresponding to one sample logistics bill and annotation information corresponding to the sample logistics bill, and the annotation information represents actual query results of the sample logistics bill respectively in the multiple candidate data sources.

[0125] For understanding of the sample logistics bill and the logistics feature corresponding to the sample logistics bill, refer to the target logistics bill and the logistics feature of the target logistics bill in the above-mentioned example. Details are omitted here for simplicity.

[0126] Similarly, a manner of obtaining the training sample and a quantity of training samples

are not limited in this embodiment. For example, they can be determined by the query system based on needs, a history record, an experiment, etc.

[0127] For example, the query system can obtain a corresponding quantity or proportion of training samples based on completed historical query or an ongoing logistics query chain.

[0128] With reference to the above-mentioned example, there are multiple candidate data sources. For any sample logistics bill, annotation information of the sample logistics bill includes an actual query result of the sample logistics bill in each candidate data source. That is, the annotation information of the sample logistics bill includes multiple actual query results, and one candidate data source corresponds to one actual query result.

[0129] The actual query result is used to represent whether a logistics status of a sample logistics bill is successfully identified in a candidate data source. That is, the actual query result may be that the logistics status of the sample logistics bill is successfully identified. For example, the logistics status of the sample logistics bill is "delivered", "in transit", etc. The actual query result may alternatively be a query failure. For example, the logistics status of the sample logistics bill cannot be identified.

[0130] In some embodiments, the query system can determine an input feature of the target model according to the logistics feature corresponding to the logistics bill. With reference to the above-mentioned analysis, it can be learned that the logistics feature corresponding to the logistics bill includes content of multiple dimensions, for example, a logistics service provider, time elapsed since shipment, a receiving region, a shipping region, logistics status query success rates of a logistics bill from the logistics service provider in multiple candidate data sources, and logistics status query success rates corresponding to the multiple candidate data sources. In this case, the query system can use a one-hot coding technology to code content of the logistics feature corresponding to the logistics bill to obtain the input feature. Before performing coding processing, the query system can perform normalization processing on the time elapsed since shipment.

[0131] In this embodiment, the query system trains the target model by using the logistics feature and the annotation information of the sample logistics bill, the logistics feature of the sample logistics bill represents content of the sample logistics bill and related content of logistics status query of multiple candidate data sources, and the annotation information represents a result indicating whether query is actually successful. Therefore, the trained target model has a capability of predicting a probability that each candidate data source can successfully query the logistics

status of the logistics bill, that is, the target model has relatively strong reliability.

[0132] In some embodiments, the process of training the target model by the query system can include the following steps 1 and 2:

[0133] Step 1: Input the logistics feature corresponding to the sample logistics bill into the target model, to obtain predicted query results that are of the sample logistics bill in the multiple candidate data sources and that are output by the target model.

[0134] With reference to the above-mentioned example, there are multiple candidate data sources, and a basic network of the target model is a classification model. The query system inputs the logistics feature corresponding to the sample logistics bill into the multi-classification model, and outputs multiple predicted query results. One candidate data source corresponds to one predicted query result.

[0135] Step 2: Update a parameter of the target model with a training objective of minimizing a difference between the actual query results and the predicted query results.

[0136] Correspondingly, the query system uses minimizing the difference between the actual query results and the predicted query results as the training objective, so as to adjust the parameter of the multi-classification model. The training process is repeatedly performed until a predetermined training end condition is reached, to obtain the target model.

[0137] With reference to step 1 and step 2, it can be learned that in this embodiment, the query system uses minimizing the difference between the actual query results and the predicted query results as the training objective, so as to obtain the target model through training. A difference between a predicted query result predicted by the target model and an actual query result can be relatively small, that is, the predicted query result of the target model can be highly consistent with the actual query result, thereby improving prediction precision and reliability of the target model.

[0138] S304: Perform logistics status query on the target logistics bill in the target data source to obtain the logistics status of the target logistics bill.

[0139] With reference to the above-mentioned example and FIG. 4, after determining from the candidate data sources that the target data source is the data source 3, the query system can query the logistics status of the target logistics bill in the data source 3 to obtain the logistics status of the target logistics bill.

[0140] It is worthwhile to note that the query system queries the logistics status of the target logistics bill in the target data source, and may obtain the logistics status of the target logistics bill

(that is, the query may be successful), or the query may fail. If the query fails, the query system can re-perform S301 to S304 to perform re-query. Or the query system can output prompt information to prompt the staff to perform query.

[0141] In some embodiments, the query method provided in this specification can be applied to the logistics query scenario described above. In this case, S301 can include: In response to receiving a logistics status query request triggered by a user, the query system obtains the target logistics bill uploaded by the user. Correspondingly, after the logistics status of the target logistics bill is obtained by performing S304, the query system can further display the logistics status of the target logistics bill to the user.

[0142] For example, with reference to FIG. 1, the client 102 can output an interaction interface. The user can upload the target logistics bill to the client through the interaction interface and initiate the logistics status query request. In this case, the logistics status query request received by the client 102 carries the target logistics bill, and the client 102 can obtain the target logistics bill from the logistics status query request. Or the user can initiate the logistics status query request to the client 102 by using the interaction interface, where the logistics status query request carries indication information used to indicate the target logistics bill. The client 102 can obtain the target logistics bill based on the indication information.

[0143] For example, as shown in FIG. 6, the interaction interface includes an "Upload" virtual key. The user can tap the "Upload" virtual key to load the target logistics bill, and when tapping an "OK" virtual key, initiate the logistics status query request to the client.

[0144] After obtaining the target logistics bill uploaded by the user, the client 102 can perform the logistics status query method described in this specification, so as to obtain the logistics status of the target logistics bill. If the logistics status of the target logistics bill is "Delivered", as shown in FIG. 6, the client 102 can also output interaction information "Logistics status: delivered" by using the interaction interface.

[0145] It can be learned from the above-mentioned analysis that the client can perform the above-mentioned query method to obtain the logistics status of the target logistics bill. Correspondingly, the client can output the logistics status of the target logistics bill by using the interaction interface, so as to display the logistics status to the user. In some embodiments, after receiving the logistics status query request, the client 102 can further forward the logistics status query request to the server 103. The server 103 obtains the target logistics bill in response to the

logistics status query request, and performs the logistics status query method described in this specification, so as to obtain the logistics status of the target logistics bill. The server 103 can return the logistics status to the client 102, so the client 102 displays the logistics status in the interaction interface.

[0146] It can be understood that the query method provided in this specification is applied to the logistics status query scenario, so the user can upload a logistics bill to implement logistics status query of the logistics bill. In the query process, an interaction manner is simple and convenient, and query experience of the user can be improved.

[0147] In some other embodiments, the query method provided in this specification can be further applied to a risk control scenario. In this case, S301 can include: obtaining a transaction proof document corresponding to a target transaction in response to detecting that an authenticity verification request corresponding to the target transaction is triggered, and obtaining the target logistics bill from the transaction proof document. Correspondingly, after the logistics status of the target logistics bill is obtained by performing S304, the query system can further determine the authenticity of the target transaction at least based on the logistics status of the target logistics bill.

[0148] The target transaction can be understood as a transaction between a payee (or referred to as a seller, a selling party, or a consignor) and a payer (or referred to as a buyer, a consumer, or a consignee). The authenticity verification request can be understood as a request for verifying the authenticity of the target transaction. The transaction proof document can be understood as a document that can prove actual existence of the target transaction. The transaction proof document can include the target logistics bill, and can further include a contract, an invoice, etc. corresponding to the target transaction.

[0149] FIG. 7 is a schematic diagram of another group of interaction interfaces according to an embodiment of this specification. The following provides examples with reference to FIG. 1 and FIG. 7. The client 102 can output an interaction interface. As shown in FIG. 7, the interaction interface includes "Pay" and/or "Receive" virtual keys. For example, the payer of the target transaction can tap the "Pay" virtual key in the interaction interface to initiate a payment operation for the target transaction. The payer of the target transaction can tap the "Pay" virtual key in the interaction interface to initiate a payment operation for the target transaction.

[0150] Continuing to refer to FIG. 7, the client 102 can output prompt information "Please provide the transaction proof document corresponding to the target transaction" in the interaction

interface in response to a tap operation on the "Receive" or "Pay" virtual key by a participant of the target transaction. The participant of the target transaction can tap "Upload" to upload one or more transaction proof documents, including the logistics bill.

[0151] The client 102 can send the transaction proof document uploaded by the user to the server 103. When the server 103 receives the transaction proof document, a transaction authenticity verification request corresponding to the target transaction is triggered. The server 103 obtains the target logistics bill from the transaction proof document, and performs the query method provided in this specification to obtain the logistics status of the target logistics bill.

[0152] In some embodiments, the server 103 can determine that the target transaction is a real transaction if the logistics status is "delivered". That is, an authenticity verification result corresponding to the transaction authenticity verification request is that authenticity verification succeeds. In some other embodiments, if the logistics status is "delivered", the server 103 can further determine, based on information in another proof material (such as a contract and an invoice), whether the target transaction is a real transaction, so as to obtain an authenticity verification result.

[0153] After obtaining the authenticity verification result, the server 103 can perform a payment operation or a payment collection operation in a case that the authenticity verification result is that the authenticity verification succeeds. The server 103 can feed back an execution result of the payment operation/payment collection operation to the client 102. Therefore, the client 102 outputs, by using the interaction interface, interaction information "Collection/payment succeeded" shown in FIG. 7. In a case that the authenticity verification result is that the authenticity verification fails, the server 103 does not perform a corresponding payment operation or a payment collection operation. The server 103 feeds back the authenticity verification result to the client 102, so the client 102 outputs interaction information "Collection/payment failed" shown in FIG. 7.

[0154] In some other embodiments, in a case that the authenticity verification fails, the server 103 can prompt the user that collection/payment fails, and can further prompt the user to re-upload the transaction proof document, or to change the target transaction to manual review, so as to re-authenticate the target transaction.

[0155] It is worthwhile to note that FIG. 7 shows a case that a transaction authenticity verification process is performed in an online manner. In some cases, the transaction authenticity verification process can alternatively be performed in an offline manner. For example, after the

participant of the target transaction uploads the transaction proof document in the interaction page provided by the client 102, the client 102 can prompt, by using the interaction interface, the user that "The target transaction is under review, and the expected review duration is X hours. Please wait...". In this case, the target transaction is added to a transaction queue. Subsequently, the server 103 can sequentially perform an authenticity verification process on each transaction in the transaction queue according to a transaction sequence in the transaction queue. When the server 103 processes the target transaction, a transaction authenticity verification request corresponding to the target transaction is triggered. In response to the triggering of the transaction verification request corresponding to the target transaction, the server 103 obtains the target logistics bill from the transaction proof document corresponding to the target transaction, and performs the query method provided in this specification to obtain the logistics status of the target logistics bill. Further, the authenticity of the target transaction is determined based on the logistics status. For a specific implementation, refer to the above-mentioned related descriptions performed in the online manner. Details are omitted here for simplicity.

[0156] It should be understood that the above-mentioned examples are merely used to describe examples of a possible authenticity verification manner in which the query system is at least based on the logistic status of the target logistics bill, which should not be understood as a limitation on the authenticity verification manner. For example, in some other embodiments, when the logistics status of the target logistics bill is "delivered", the query system can continue to determine, in combination with other content in the transaction proof document and/or manual manner, whether the target transaction is a real transaction.

[0157] It can be understood that the query method provided in this specification is applied to the risk control scenario, and the logistics status of the target logistics bill can be obtained based on the target logistics bill uploaded by the user. Further, with reference to the logistics status of the target logistics bill, authenticity of the target transaction is verified, so as to improve reliability of risk prevention and control of the target transaction.

[0158] It is worthwhile to note that, the above-mentioned examples are merely used to describe examples of a possible implementation of the query method in this specification, and cannot be understood as a limitation on the implementation of the query method in this specification. For example, based on the above-mentioned technical concept, some of the above-mentioned technical features can be combined to obtain a new embodiment, a new technical feature can be added based

on the above-mentioned example to obtain a new embodiment, some technical features can be reduced based on the above-mentioned example to obtain a new embodiment, some technical features in the above-mentioned example can be replaced with other technical features, or some technical features and orders in the above-mentioned example can be adjusted to obtain a new embodiment. Examples are not listed one by one here.

[0159] According to the above-mentioned technical concept, this specification further provides a computer-readable non-transitory storage medium. The computer-readable non-transitory storage medium stores at least one instruction set, and when the at least one instruction set is executed by a processor, steps of the query method described in this specification are implemented.

[0160] In some possible implementations, aspects of this specification can alternatively be implemented in a form of a program product, including program code. When the program product runs on the query system 200, the program code is used to enable the query system 200 to perform the steps of the query method described in this specification. The program product used to implement the above-mentioned method can be a portable compact disk read-only memory (CD-ROM) including program code, and can run on the query system 200. However, the program product in this specification is not limited thereto. In this specification, a readable storage medium can be any tangible medium that includes or stores a program, and the program can be used by or in combination with an instruction execution system. The program product can be any combination of one or more readable media. The readable medium can be a readable signal medium or a readable storage medium. For example, the readable storage medium can be but is not limited to an electrical system, apparatus, or device, a magnetic system, apparatus, or device, an optical system, apparatus, or device, an electromagnetic system, apparatus, or device, an infrared system, apparatus, or device, or a semiconductor system, apparatus, or device, or any combination thereof. More specific examples of the readable storage medium include: an electrical connection including one or more conducting wires, a portable disk, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or flash memory), an optical fiber, a portable compact disc read-only memory (CD-ROM), an optical storage component, a magnetic storage component, or any proper combination thereof. The computer-readable storage medium can include a data signal propagated in a baseband or as a part of a carrier, and carries readable program code. The data signal propagated in such a way can be

in multiple forms, and includes but is not limited to an electromagnetic signal, an optical signal, or any proper combination thereof. The readable storage medium can further be any readable medium other than the readable storage medium, and the readable medium can be used to send, propagate, or transmit a program used by or in combination with an instruction execution system, apparatus, or component. The program code included in the readable storage medium can be transmitted in any proper medium, including but not limited to a wireless medium, a wired medium, an optical cable, an RF medium, et., or any proper combination thereof. The program code for performing operations in this specification can be written in any combination of one or more program design languages. The program design language includes an object-oriented program design language, such as Java or C++, and further includes a conventional procedural program design language, such as a "C" language or a similar program design language. The program code can be completely executed on the query system 200, partially executed on the query system 200, executed as an independent software package, partially executed on the query system 200 and partially executed on a remote query system, or completely executed on a remote query system 200.

[0161] It is worthwhile to note that, collection, storage, use, processing, transmission, provision, disclosure, etc. of related information (for example, the logistics service provider and the receiving region) of a user in the technical solutions in this specification all comply with related laws and regulations, and do not violate public order and good morals.

[0162] Specific embodiments of this specification are described above. Other embodiments fall within the scope of the appended claims. In some cases, the actions or steps described in the claims can be performed in an order different from that in the embodiments, and the desired results can still be achieved. In addition, the process depicted in the accompanying drawings does not necessarily need a particular order or consecutive order to achieve the desired results. In some implementations, multitasking and parallel processing are possible or may be advantageous.

[0163] In conclusion, after reading the detailed disclosure, a person skilled in the art can understand that the above-mentioned detailed disclosure can be presented only in an example manner, and can impose no limitation. Although it is not explicitly stated here, a person skilled in the art can understand that the requirements of this specification include various proper changes, improvements, and modifications to the embodiments. These changes, improvements, and modifications are intended to be proposed in this specification, and fall within the spirit and scope

of the example embodiments of this specification.

[0164] In addition, some terms in this specification are used to describe the embodiments of this specification. For example, "one embodiment", "an embodiment", and/or "some embodiments" mean that particular features, structures, or characteristics described with reference to the embodiments can be included in at least one embodiment of this specification. Therefore, it can be emphasized and understood that two or more of "an embodiment", "one embodiment", or "alternative embodiments" referred in parts of this specification do not necessarily indicate the same embodiment. In addition, particular features, structures, or characteristics can be properly combined in one or more embodiments of this specification.

[0165] It should be understood that in the above-mentioned descriptions of the embodiments of this specification, to help understand a feature, for the purpose of simplifying this specification, various features are combined in a single embodiment, accompanying drawing, or description thereof in this specification. However, this does not mean that the combination of these features is necessary. It is entirely possible for a person skilled in the art to mark some devices and understand the devices as separate embodiments when reading this specification. In other words, the embodiments in this specification can also be understood as an integration of multiple secondary embodiments. Content of each secondary embodiment is also true when features are less than all features in one of the above-mentioned disclosed embodiments.

[0166] Each patent, patent application, publication of a patent application, and other materials, for example, articles, books, instructions, publications, documents, and products, that are cited in this specification and that are other than any document that is inconsistent or conflict with this document or that imposes limiting impact on the widest scope of the claims can be incorporated here by reference and used for all purposes now or later associated with this document. In addition, the term in this document shall prevail when there is any inconsistency or conflict between the description, definition and/or use of a related term in any material and the description, definition and/or use of a related term in this document.

[0167] Finally, it should be understood that the principles of the implementation solutions of this specification are described in the implementation solutions of the application disclosed in this specification. Other modified embodiments also fall within the scope of this specification. Therefore, the embodiments disclosed in this specification are merely examples and not limitations. A person skilled in the art can use an alternative configuration according to the embodiments of

this specification to implement the application in this specification. Therefore, the embodiments of this specification are not limited to the embodiments accurately described in the application.

CLAIMS

What is claimed is:

1. A logistics status query method, comprising:

obtaining a target logistics bill;

determining a logistics feature based on the target logistics bill;

determining, by using a pre-trained target model and based on the logistics feature, a target data source used to query a logistics status of the target logistics bill from multiple candidate data sources, wherein the target model is trained to predict probabilities that the multiple candidate data sources are capable of successfully querying a logistics status of a logistics bill; and

performing logistics status query on the target logistics bill in the target data source to obtain the logistics status of the target logistics bill.

2. The method according to claim 1, wherein the determining, by using a pre-trained target model and based on the logistics feature, a target data source used to query a logistics status of the target logistics bill from multiple candidate data sources comprises:

inputting the logistics feature into the target model to obtain target probabilities that the multiple candidate data sources are capable of successfully querying the logistics status of the target logistics bill; and

determining the target data source from the multiple candidate data sources according to the target probabilities respectively corresponding to the multiple candidate data sources.

3. The method according to claim 2, wherein the determining the target data source from the multiple candidate data sources according to the target probabilities respectively corresponding to the multiple candidate data sources comprises:

determining a candidate data source corresponding to a maximum probability in the target probabilities respectively corresponding to the multiple candidate data sources as the target data source.

4. The method according to claim 2, wherein the determining the target data source from the multiple candidate data sources according to the target probabilities respectively corresponding to the multiple candidate data sources comprises:

determining at least two data sources to be selected from the multiple candidate data sources, wherein the target probabilities corresponding to the data sources to be selected are greater than or

equal to a predetermined threshold; and

obtaining query costs respectively corresponding to the at least two data sources to be selected, and determining a data source to be selected whose corresponding query cost is the minimum as the target data source.

5. The method according to claim 1, wherein the target model is obtained by training multiple training samples, one training sample comprises a logistics feature corresponding to one sample logistics bill and annotation information corresponding to the sample logistics bill, and the annotation information represents actual query results of the sample logistics bill respectively in the multiple candidate data sources.

6. The method according to claim 5, wherein a training process of the target model comprises:

inputting the logistics feature corresponding to the sample logistics bill into the target model, to obtain predicted query results that are of the sample logistics bill in the multiple candidate data sources and that are output by the target model; and

updating a parameter of the target model with a training objective of minimizing a difference between the actual query results and the predicted query results.

7. The method according to claim 1, wherein the obtaining a target logistics bill comprises: obtaining a transaction proof document corresponding to a target transaction in response to detecting that an authenticity verification request corresponding to the target transaction is triggered, and obtaining the target logistics bill from the transaction proof document; and

after the logistics status of the target logistics bill is obtained, the method further comprises: determining authenticity of the target transaction at least based on the logistics status of the target logistics bill.

8. The method according to claim 1, wherein the obtaining a target logistics bill comprises: obtaining the target logistics bill uploaded by a user in response to receiving a logistics status query request triggered by the user; and

after the logistics status of the target logistics bill is obtained, the method further comprises: displaying the logistics status of the target logistics bill to the user.

9. The method according to claim 1, wherein the logistics feature comprises a logistics bill feature corresponding to the target logistics bill, wherein

the logistics bill feature comprises at least one of the following: a logistics service provider, time elapsed since shipment, a receiving region, a shipping region, and logistics status query

success rates of a logistics bill from the logistics service provider in the multiple candidate data sources.

10. The method according to claim 9, wherein the logistics bill feature comprises: the logistics service provider, the time elapsed since shipment, the receiving region, the shipping region, and the logistics status query success rates of the logistics bill from the logistics service provider in the multiple candidate data sources, and determining the logistics bill feature based on the target logistics bill comprises:

performing text recognition on the target logistics bill to obtain the logistics service provider, the receiving region, the shipping region, and shipping time from the target logistics bill through recognition;

determining the time elapsed since shipment according to the shipping time; and

obtaining the logistics status query success rates of the logistics bill from the logistics service provider in the multiple candidate data sources according to historical query data related to the logistics service provider.

11. The method according to claim 9, wherein the logistics feature further comprises data source features corresponding to the multiple candidate data sources, wherein the data source features comprise logistics status query success rates respectively corresponding to the multiple candidate data sources.

12. A logistics status query system, comprising:

at least one storage medium, storing at least one instruction set for querying a logistics status; and

at least one processor, communicatively connected to the at least one storage medium, wherein when running, the at least one processor reads the at least one instruction set, and performs the following operations based on an indication of the at least one instruction set:

obtaining a target logistics bill;

determining a logistics feature based on the target logistics bill;

determining, by using a pre-trained target model and based on the logistics feature, a target data source used to query a logistics status of the target logistics bill from multiple candidate data sources, wherein the target model is trained to predict probabilities that the multiple candidate data sources are capable of successfully querying a logistics status of a logistics bill; and

performing logistics status query on the target logistics bill in the target data source to obtain

the logistics status of the target logistics bill.

13. The system according to claim 12, wherein to obtain the target data source, the at least one processor:

inputs the logistics feature into the target model to obtain target probabilities that the multiple candidate data sources are capable of successfully querying the logistics status of the target logistics bill; and

determines the target data source from the multiple candidate data sources according to the target probabilities respectively corresponding to the multiple candidate data sources.

14. The system according to claim 13, wherein to obtain the target data source, the at least one processor:

determines a candidate data source corresponding to a maximum probability in the target probabilities respectively corresponding to the multiple candidate data sources as the target data source.

15. The system according to claim 13, wherein to obtain the target data source, the at least one processor:

determines at least two data sources to be selected from the multiple candidate data sources, wherein the target probabilities corresponding to the data sources to be selected are greater than or equal to a predetermined threshold; and

obtains query costs respectively corresponding to the at least two data sources to be selected, and determines a data source to be selected whose corresponding query cost is the minimum as the target data source.

16. The system according to claim 12, wherein the target model is obtained by training multiple training samples, one training sample comprises a logistics feature corresponding to one sample logistics bill and annotation information corresponding to the sample logistics bill, and the annotation information represents actual query results of the sample logistics bill respectively in the multiple candidate data sources.

17. The system according to claim 16, wherein a training process of the target model comprises:

inputting the logistics feature corresponding to the sample logistics bill into the target model, to obtain predicted query results that are of the sample logistics bill in the multiple candidate data sources and that are output by the target model; and

updating a parameter of the target model with a training objective of minimizing a difference between the actual query results and the predicted query results.

18. The system according to claim 12, wherein to obtain the target logistics bill, the at least one processor obtains a transaction proof document corresponding to a target transaction in response to detecting that an authenticity verification request corresponding to the target transaction is triggered, and obtains the target logistics bill from the transaction proof document; and

after the logistics status of the target logistics bill is obtained, the at least one processor determines authenticity of the target transaction at least based on the logistics status of the target logistics bill.

19. The system according to claim 12, wherein to obtain the target logistics bill, the at least one processor obtains the target logistics bill uploaded by a user in response to receiving a logistics status query request triggered by the user; and

after the logistics status of the target logistics bill is obtained, the at least one processor displays the logistics status of the target logistics bill to the user.

20. A computer-readable non-transitory storage medium, wherein the computer-readable non-transitory storage medium stores at least one instruction set, and when the at least one instruction set is executed by at least one processor, the method according to any one of claims 1 to 11 is implemented.