

DATA PROCESSING METHOD AND SYSTEM FOR JOINT LOAN, MEDIUM, AND DEVICE

FIELD

5 **[0001]** The present disclosure relates to the field of financial business data processing, in particular to a data processing method for joint loan, a data processing system for joint loan, a medium and a device.

BACKGROUND

10 **[0002]** Joint loan means that two or more banks together provide loans to a project or an enterprise. In the joint loan, there are multiple funders instead of one.

[0003] In performing the present disclosure, it is found that the conventional technology has at least the following problems. According to the conventional technology, transaction data is scattered and the data quality is poor, resulting in that it is impossible to select a desired and
15 reliable cooperative funder from multiple dimensions.

SUMMARY

[0004] In view of the above, a data processing method for joint loan, a data processing system for joint loan, a medium and a device are provided according to the embodiments of
20 the present disclosure, to solve the above technical problems.

[0005] In a first aspect, a data processing method for joint loan is provided according to an embodiment of the present disclosure. The method includes: obtaining multiple pieces of transaction data of a transaction; performing data distribution processing on the multiple pieces of transaction data to determine multiple pieces of normal transaction data; performing
25 integration and assembly processing on multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information; generating multiple pieces of index data for a routing rule based on the full transaction chain monitoring information; obtaining a routing rule corresponding to a leading bank; obtaining,
30 based on the routing rule corresponding to the leading bank, verification index data of

multiple participating banks corresponding to the routing rule corresponding to the leading bank from the multiple pieces of index data; filtering out, based on the routing rule corresponding to the leading bank and the verification index data of the multiple participating banks, a participating bank that is not suitable for the leading bank to determine an available participating bank; and sending a credit-granting application transaction to the available participating bank.

[0006] In some embodiments, after performing data distribution processing on the multiple pieces of transaction data to determine the multiple pieces of normal transaction data, the method further includes: performing data distribution processing on the transaction data to determine abnormal transaction data; labeling, in a case that the number of occurrences of abnormal transaction data reaches a predetermined number in a predetermined time period, the transaction as a circuit-breaker transaction; and sending a circuit breaker notification, where the circuit breaker notification indicates that a circuit breaker occurs for the transaction.

[0007] In some embodiments, the performing integration and assembly processing on multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information includes:

for each of the multiple pieces of transaction data,

determining whether the piece of transaction data exists in a message queue based on a unique transaction ID, performing analysis processing on the piece of transaction data in a case that the piece of transaction data does not exist in the message queue, and skipping the piece of transaction data in a case that the piece of transaction data exists in the message queue;

in performing analysis processing on the piece of transaction data, labeling the piece of transaction data by:

labeling the piece of transaction data with a first mark in a case that the piece of transaction data is in a first final state, where the first final state is a state in which a receiver returns a processing result of the transaction, and both a transaction starting time instant and a transaction ending time instant exist;

labeling the piece of transaction data with a second mark in a case that the piece of

transaction data is in an initial state, where the initial state is a state in which a receiver returns that the transaction is in a processing state, and a transaction starting time instant exists and a transaction ending time instant does not exist; and

5 labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in a second final state, where the second final state is a state in which a receiver returns a processing result of the transaction, and a transaction ending time instant exists and a transaction starting time instant does not exist;

obtaining transaction data labeled with the second mark, and merging transaction states, transaction starting time instants, transaction ending time instants, codes of a leading bank, codes of a participating bank, types of a customer certificate, the numbers of the customer certificate, application numbers, and credit-using numbers of all transaction data labeled with the second label; and

determining, in a case that the merged transaction data is in the first final state, the merged transaction data as the full transaction chain monitoring information.

15 **[0008]** In some embodiments, before obtaining the routing rule corresponding to the leading bank, the method further includes: obtaining routing switch configuration information of a participating bank; filtering out a participating bank with routing switch configuration information indicating that a routing switch is in a closed state; obtaining project configuration information of the leading bank; obtaining an asset access condition based on the project configuration information of the leading bank; and filtering out, based on the asset access condition, a participating bank not meeting the asset access condition.

[0009] In some embodiments, the filtering out, based on the routing rule corresponding to the leading bank and the verification index data of the multiple participating banks, a participating bank that is not suitable for the leading bank includes: filtering out the participating bank that is not suitable for the leading bank based on a comparison result between the verification index data of the multiple participating banks and the routing rule, where the verification index data of the participating banks includes at least one of: an abnormal circuit breaker, a credit-granting approval time limit, a record indicating whether a customer is rejected in last X days, a credit-granting approval rate in last X months, and a credit-granting rejection rate in the last X months, where X is a positive integer.

[0010] In some embodiments, after generating the multiple pieces of index data for the routing rule based on the full transaction chain monitoring information, the method further includes: generating index data related to a credit-granting ranking based on the full transaction chain monitoring information, where the index data includes at least one of: a response rate, a loan success rate, a capital cost, and the credit-granting approval time limit; and after filtering out, based on the routing rule corresponding to the leading bank and the verification index data of the multiple participating banks, the participating bank that is not suitable for the leading bank, the method further includes: obtaining the index data related to the credit-granting ranking; determining a credit-granting score of each of the participating banks based on at least one of the response rate, the loan success rate, the capital cost, and the credit-granting approval time limit; and determining a priority of the available participating bank based on the credit-granting score of each of the participating banks.

[0011] In some embodiments, the determining a credit-granting score of each of the participating banks based on at least one of the response rate, the loan success rate, the capital cost, and the credit-granting approval time limit includes determining the credit-granting score of each of the participating banks by using the following equation:

a credit-granting score of a participating bank=(a first weight*(1+a*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+a second weight*(1+b* a sequence number of the participating bank ranking in an ascending order based on min(response rate))+a third weight*(1+c*a sequence number of the participating bank ranking in a descending order based on max(loan success rate))+a fourth weight*(1+d*a sequence number of the participating bank ranking in an ascending order based on min(credit-granting approval time limit))/4

where a sum of the first weight, the second weight, the third weight and the fourth weight is 1.

[0012] In some embodiments, the sending a credit-granting application transaction to the available participating bank includes: in a case that a credit-granting sending mode in product configuration information of the leading bank is a mode of finding multiple joint parties, sending a credit-granting application transaction to each of available participating banks, and receiving a return result from each of the available participating banks; and in a case that a credit-granting sending mode in product configuration information of the leading bank is a

mode of finding a joint party one by one, ranking the available participating banks in an ascending order based on credit-granting scores of the participating banks, and sending credit-granting application transactions to the available participating banks one by one, where if a current participating bank returns a credit-granting failure result, a credit-granting application transaction is sent to a subsequent participating bank, and if a current participating bank returns a credit-granting success result, no credit-granting application transaction is sent to a subsequent participating bank.

[0013] In a second aspect, a data processing method for joint loan is provided according to an embodiment of the present disclosure. The method includes: obtaining multiple pieces of transaction data of a transaction; performing data distribution processing on the multiple pieces of transaction data to determine multiple pieces of normal transaction data; performing integration and assembly processing on multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information; generating multiple pieces of index data related to a credit-using ranking based on the full transaction chain monitoring information, where the multiple pieces of index data related to the credit-using ranking include at least one of: a response rate, a loan success rate, a capital cost, and a credit-using approval time limit; receiving credit-using application information; obtaining a corresponding credit-granting application result based on the credit-using application information; obtaining the multiple pieces of index data related to the credit-using ranking; calculating credit-using scores of participating banks based on the multiple pieces of index data related to the credit-using ranking; ranking the participating banks in an ascending order based on the credit-using scores of the participating banks; and sending a credit-using application transaction to each of the participating banks based on the ascending order.

[0014] In some embodiments, the performing integration and assembly processing on multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information includes:

for each of the multiple pieces of transaction data,

determining whether the piece of transaction data exists in a message queue based on a unique transaction ID, performing analysis processing on the piece of transaction data in a

case that the piece of transaction data does not exist in the message queue, and skipping the piece of transaction data in a case that the piece of transaction data exists in the message queue;

5 in performing analysis processing on the piece of transaction data, labeling the piece of transaction data by:

labeling the piece of transaction data with a first mark in a case that the piece of transaction data is in a first final state, where the first final state is a state in which a receiver returns a processing result of the transaction, and both a transaction starting time instant and a transaction ending time instant exist;

10 labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in an initial state, where the initial state is a state in which a receiver returns that the transaction is in a processing state, and a transaction starting time instant exists and a transaction ending time instant does not exist; and

15 labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in a second final state, where the second final state is a state in which a receiver returns a processing result of the transaction, and a transaction ending time instant exists and a transaction starting time instant does not exist;

20 obtaining transaction data labeled with the second mark, and merging transaction states, transaction starting time instants, transaction ending time instants, codes of a leading bank, codes of a participating bank, types of a customer certificate, the numbers of the customer certificate, application numbers, and credit-using numbers of all transaction data labeled with the second label; and

determining, in a case that the merged transaction data is in the first final state, the merged transaction data as the full transaction chain monitoring information.

25 **[0015]** In some embodiments, the calculating credit-using scores of participating banks based on the multiple pieces of index data related to the credit-using ranking includes: calculating the credit-using scores of the participating banks based on the multiple pieces of index data related to the credit-using ranking and a predetermined weight.

30 **[0016]** Specifically, the credit-using scores of the participating banks are calculated by using the following equation:

a credit-using score of a participating bank=(a first weight*(1+a*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+a second weight*(1+b* a sequence number of the participating bank ranking in an ascending order based on min(response rate))+a third weight*(1+c*a sequence number of the participating bank ranking in a descending order based on max(loan success rate))+a fourth weight*(1+d*a sequence number of the participating bank ranking in an ascending order based on min(credit-using approval time limit)))/4

where a sum of the first weight, the second weight, the third weight and the fourth weight is 1.

10 **[0017]** In a third aspect, a computer-readable storage medium is provided according to an embodiment of the present disclosure. The computer-readable storage medium stores a computer program. The computer program, when executed by a processor, causes the processor to perform any one of the data processing methods for joint loan described above.

15 **[0018]** In a fourth aspect, a computer device is provided according to an embodiment of the present disclosure. The computer device includes: one or more processors and a memory. The memory stores one or more programs. The one or more programs, when executed by one or more processors, cause the one or more processors to perform any one of the data processing methods for joint loan described above.

20 **[0019]** In a fifth aspect, a data processing system for joint loan is provided according to an embodiment of the present disclosure. The system includes: a first server and a second server. The first server is configured to: obtain multiple pieces of transaction data of a transaction; perform data distribution processing on the multiple pieces of transaction data to determine multiple pieces of normal transaction data; perform integration and assembly processing on multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information; and generate multiple pieces of index data associated with a routing rule based on the full transaction chain monitoring information. The second server is configured to: obtain a routing rule corresponding to a leading bank; obtain, based on the routing rule corresponding to the leading bank, verification index data of multiple participating banks corresponding to the routing rule corresponding to the leading bank from the multiple pieces of index data; filter out, based on the routing rule

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corresponding to the leading bank and the verification index data of the multiple participating banks, a participating bank that is not suitable for the leading bank to determine an available participating bank; and send a credit-granting application transaction to the available participating bank.

5 **[0020]** In a sixth aspect, a data processing system for joint loan is provided according to an embodiment of the present disclosure. The system includes a first server and a second server. The first server is configured to: obtain multiple pieces of transaction data of a transaction; perform data distribution processing on the multiple pieces of transaction data to determine multiple pieces of normal transaction data; perform integration and assembly processing on
10 multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information; generate multiple pieces of index data related to a credit-using ranking based on the full transaction chain monitoring information, where the multiple pieces of index data related to the credit-using ranking includes at least one of: a
15 response rate, a loan success rate, a capital cost, and a credit-using approval time limit. The second server is configured to: receive credit-using application information; obtain a corresponding credit-granting application result based on the credit-using application information; obtain the multiple pieces of index data related to the credit-using ranking; calculate credit-using scores of participating banks based on the multiple pieces of index data
20 related to the credit-using ranking; rank the participating banks in an ascending order based on the credit-using scores of the participating banks; and send a credit-using application transaction to each of the participating banks based on the ascending order.

[0021] In a seventh aspect, a data processing system for joint loan is provided according to an embodiment of the present disclosure. The system includes a first server and a second
25 server. The first server is configured to: obtain multiple pieces of transaction data of a transaction; perform data distribution processing on the multiple pieces of transaction data to determine multiple pieces of normal transaction data; perform integration and assembly processing on multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is
30 processed, to obtain full transaction chain monitoring information; generate multiple pieces of index data based on the full transaction chain monitoring information, where the multiple pieces of index data include verification index data of multiple participating banks and

multiple pieces of index data related to a credit-using ranking. The second server is configured to: receive credit-granting application information, and obtain a routing rule corresponding to a leading bank based on the credit-granting application information; obtain, based on the routing rule, verification index data of multiple participating banks
5 corresponding to the routing rule from the multiple pieces of index data; filter out, based on the routing rule and the verification index data of the multiple participating banks, a participating bank that is not suitable for the leading bank to determine an available participating bank; send a credit-granting application transaction to the available participating bank; and receive credit-using application information; obtain a corresponding credit-granting
10 application result based on the credit-using application information; obtain the multiple pieces of index data related to the credit-using ranking; calculate credit-using scores of participating banks based on the multiple pieces of index data related to the credit-using ranking; rank the participating banks in an ascending order based on the credit-using scores of the participating banks; and send a credit-using application transaction to each of the participating banks based
15 on the ascending order.

[0022] The above technical solutions have the following beneficial effects.

[0023] According to the technical solutions, the main requirements for monitoring transaction data are clarified, the transaction data and the technical data for routing calculation are provided, the conventional transaction requirements and future transaction expansion are
20 ensured, thereby realizing intelligent routing management based on multi-dimensional rules.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] In order to more clearly illustrate technical solutions in embodiments of the present disclosure or in the conventional technology, the drawings to be used in the description of the
25 embodiments or the conventional technology are briefly described below. Apparently, the drawings in the following description show only some embodiments of the present disclosure, and other drawings may be obtained by those skilled in the art from the drawings without any creative work.

[0025] Figure 1 is a flow chart of a data processing method for joint loan according to an
30 embodiment of the present disclosure;

[0026] Figure 2 is a flow chart of a data processing method for joint loan according to another embodiment of the present disclosure;

[0027] Figure 3 is a schematic diagram showing an overall structure of a data processing method for joint loan according to an embodiment of the present disclosure;

5 **[0028]** Figure 4 is a flow chart of a rule chain process for a credit-granting transaction according to an embodiment of the present disclosure;

[0029] Figure 5 is a flow chart of a rule chain process for a credit-using transaction according to an embodiment of the present disclosure;

10 **[0030]** Figure 6 is a functional block diagram of a computer-readable storage medium according to an embodiment of the present disclosure; and

[0031] Figure 7 is a functional block diagram of a computer device according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

15 **[0032]** Technical solutions in the embodiments of the present disclosure are clearly and completely described hereinafter in conjunction with the drawings in the embodiments of the present disclosure. Apparently, the embodiments described in the following are only some embodiments of the present disclosure, rather than all embodiments. All other embodiments obtained by those skilled in the art based on the embodiments of the present disclosure
20 without any creative work fall within the protection scope of the present disclosure.

[0033] It is found in research that the conventional technology has at least one of the following defects. (1) The cost is uncontrollable in selecting a capital channel according to the conventional technology. (2) The reliability is uncontrollable in selecting a fund party according to the conventional technology. (3) Due to the close relationship between the lead
25 party and the cooperating fund party, it is required for the lead party to connect with another fund party to cooperate with the another fund party, resulting in the increase of the cost and time. (4) The transaction data is scattered and the data quality is poor, resulting in that it is impossible to select a desired and reliable cooperative fund party from multiple dimensions.

[0034] In order to overcome at least one of the above defects, the solutions according to the

embodiments of the present disclosure are provided. With the solutions, the main requirements for monitoring transaction data are clarified, the transaction data and the technical data for routing calculation are provided, and the conventional transaction requirements and future transaction expansion are ensured.

5 **[0035]** In a joint loan business scenario, in order to ensure the close binding relationship between a leading bank and a participating bank, it is required to determine different rules such as a capital cost rule, a reliability rule and a processing time limit rule. In order to make the rules in line with current and future expectations, it is required to process and count each of transactions between the leading bank and the participating bank based on the above rules,
10 providing data basis for the intelligent routing management based on the multi-dimensional rules.

[0036] First embodiment

[0037] Figure 1 is a flow chart of a data processing method for joint loan according to an embodiment of the present disclosure. The method includes the following steps S110 to S180.

15 **[0038]** In step S110, multiple pieces of transaction data of a transaction are obtained.

[0039] In step S120, data distribution processing is performed on the multiple pieces of transaction data to determine multiple pieces of normal transaction data.

[0040] In some embodiments, the data distribution processing is performed based on a return state of a transaction result encapsulation object in this step. Specifically, based on the
20 transaction result encapsulation object TradeResultDto uniformly encapsulating the transaction data, a transaction is a normal transaction (data) in a case that the return state is a non-Error state, and a transaction is an abnormal transaction (data) in a case that the return state is an Error state.

[0041] In step S130, integration and assembly processing is performed on multiple pieces
25 of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information.

[0042] In step S140, multiple pieces of index data for a routing rule or multiple pieces of
30 index data associated with a routing rule are generated based on the full transaction chain monitoring information.

[0043] In step S150, a routing rule corresponding to a leading bank is obtained.

[0044] In step S160, based on the routing rule corresponding to the leading bank, verification index data of multiple participating banks corresponding to the routing rule corresponding to the leading bank is obtained from the multiple pieces of index data.

5 **[0045]** In step S170, based on the routing rule corresponding to the leading bank and the verification index data of the multiple participating banks, a participating bank that is not suitable for the leading bank is filtered out to determine an available participating bank.

[0046] In step S180, a credit-granting application transaction is sent to the available participating bank.

10 **[0047]** In some embodiments, after the operations that the data distribution processing is performed on the multiple pieces of transaction data to determine the multiple pieces of normal transaction data in step S120, the method further includes: performing data distribution processing on the transaction data to determine abnormal transaction data; labeling, in a case that the number of occurrences of abnormal transaction data reaches a
15 predetermined number in a predetermined time period, the transaction as a circuit-breaker transaction; and sending a circuit breaker notification, where the circuit breaker notification indicates that a circuit breaker occurs for the transaction.

[0048] Specifically, data distribution processing is performed on the transaction data to determine abnormal transaction data. In a case that the number of occurrences of abnormal
20 transaction data reaches a predetermined number in a predetermined time period, the transaction is labeled as a circuit-breaker transaction. A circuit breaker notification is sent to a gateway or to a related party outside the gateway. The circuit breaker notification indicates that a circuit breaker occurs for the transaction.

[0049] In some embodiments, the operations that the integration and assembly processing is
25 performed on the multiple pieces of normal transaction data of the transaction, from the time instant at which the transaction request is initiated to the time instant at which the transaction is processed, to obtain the full transaction chain monitoring information in step S130 includes:

for each of the multiple pieces of transaction data,

determining whether the piece of transaction data exists in a message queue based on a
30 unique transaction ID, performing analysis processing on the piece of transaction data in a

case that the piece of transaction data does not exist in the message queue, and skipping the piece of transaction data in a case that the piece of transaction data exists in the message queue;

5 in performing analysis processing on the piece of transaction data, labeling the piece of transaction data by:

labeling the piece of transaction data with a first mark in a case that the piece of transaction data is in a first final state where the first final state is a state in which a receiver returns a processing result of the transaction, and both a transaction starting time instant and a transaction ending time instant exist;

10 labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in an initial state, where the initial state is a state in which a receiver returns that the transaction is in a processing state, and a transaction starting time instant exists and a transaction ending time instant does not exist; and

15 labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in a second final state, where the second final state is a state in which a receiver returns a processing result of the transaction, and a transaction ending time instant exists and a transaction starting time instant does not exist;

20 obtaining transaction data labeled with the second mark, and merging transaction states, transaction starting time instants, transaction ending time instants, codes of a leading bank, codes of a participating bank, types of a customer certificate, the numbers of the customer certificate, application numbers, and credit-using numbers of all transaction data labeled with the second label; and

determining, in a case that the merged transaction data is in the first final state, the merged transaction data as the full transaction chain monitoring information.

25 **[0050]** In some embodiments, before the operations that the routing rule corresponding to the leading bank is obtained in step S150, the method further includes: obtaining routing switch configuration information of a participating bank; filtering out a participating bank with routing switch configuration information indicating that a routing switch is in a closed state; obtaining project configuration information of the leading bank; obtaining an asset
30 access condition based on the project configuration information of the leading bank; and

filtering out, based on the asset access condition, a participating bank not meeting the asset access condition.

[0051] In some embodiments, the operations that based on the routing rule corresponding to the leading bank and the verification index data of the multiple participating banks, a participating bank that is not suitable for the leading bank is filtered out to determine an available participating bank in step S170 includes: filtering out the participating bank that is not suitable for the leading bank based on a comparison result between the verification index data of the multiple participating banks and the routing rule. The verification index data of the participating banks includes at least one of: an abnormal circuit breaker, a credit-granting approval time limit, a record indicating whether a customer is rejected in last X days, a credit-granting approval rate in last X months, and a credit-granting rejection rate in the last X months, where X is a positive integer.

[0052] The abnormal circuit breaker is determined as follows. In a case that X transactions in an Error state are made in a time period of Y, an abnormal circuit breaker is determined. Recovery from an abnormal circuit breaker is determined as follows. A transaction is resumed after Z minutes of a latest abnormal circuit breaker. X (which is a positive integer) represents a monitoring transaction number for circuit breaker, Y (which is a positive integer in minutes) represents a circuit breaker time interval, and Z (which is a positive integer in minutes) represents a circuit breaker expiration time length.

[0053] A response rate is calculated by using the following equation:

a response rate= $\frac{\text{sum}(\text{a starting time instant of monitored transaction data in a normal state}-\text{an ending time instant of the monitored transaction data in the normal state})}{\text{sum}(\text{pieces of monitored data})}$.

[0054] Based on the leading bank and the participating banks, the credit-granting approval rate in last X months is data in a final state that may be directly used by a routing platform and is obtained by summarizing pieces of monitored data based on the following equation, and the data in the final state is written into Elasticsearch:

a credit-granting approval rate in last X months= $\frac{\text{the number of credit-granting approvals in the last X months}}{\text{the number of credit-grantings in the last X months}}$.

[0055] For the credit-granting rejection rate in last X months, based on the leading bank and

the participating banks, data in a final state that may be directly used by a routing platform is obtained by summarizing pieces of monitored data based on the following equation, and the data in the final state is written into Elasticsearch:

a credit-granting rejection rate in the last X months=the number of credit-granting rejections in the last X months/the number of credit-grantings in the last X months.

[0056] The record indicating whether a customer is rejected in last X days is calculated by using the following equation:

a record indicating a customer is rejected in last X days=a transaction date when the customer is rejected is recorded with a leading bank, participating banks, a certificate type and a certificate number as a grouping condition.

[0057] A process of generating abnormal circuit breaker index data based on the full transaction chain monitoring information is illustrated by the following example.

Table of sample data in an error state

Participating banks	Sample data	Transaction time instant
Participating bank 1	Sample data 1	10:00 on November 9, 2021
Participating bank 1	Sample data 2	10:01 on November 9, 2021
Participating bank 1	Sample data 3	10:05 on November 9, 2021
Participating bank 1	Sample data 4	10:08 on November 9, 2021
Participating bank 1	Sample data 5	12:01 on November 9, 2021
Participating bank 2	Sample data 6	12:03 on November 9, 2021

[0058] A transaction result encapsulation object TradeResultDto is obtained from the sample data. Based on a participating bank, timing starts from a first piece of sample data 1 that is in an Error state and is not counted for an abnormal circuit breaker, in a case that there are X pieces of sample data in the Error state in Y minutes, it is determined for the participating bank to perform an abnormal circuit breaker, and the participating bank is recorded in redis; in a case that the pieces of sample data in the Error state is less than X in Y minutes, counting is performed when a piece of sample data in the Error state occurs.

[0059] For the participating bank that has performed an abnormal circuit breaker, timing starts from a time instant when a last abnormal circuit breaker occurs, and the participating

bank is removed from redis Z minutes later, indicating that the participating bank resumes from the circuit breaker.

[0060] For example, the monitoring transaction number X for circuit breaker is 3, the circuit breaker time interval Y is 10, and the circuit breaker expiration time length Z is 30.

5 **[0061]** In a first step, a first piece of sample data 1 in the Error state of a participating bank 1 occurs at 10:00 on November 9, 2021, and then in Y minutes which are 10 minutes, there are four transactions, that is, the sample data 1, sample data 2, sample data 3, and sample data 4.

10 **[0062]** In a second step, since there are four pieces of sample data in the Error state for the participating bank 1 in Y minutes, which is greater than the monitoring transaction number 3 for circuit breaker, then it is recorded in redis that the participating bank 1 performs an abnormal circuit breaker.

15 **[0063]** In a third step, based on a time instant of 10:08 on November 9 when sample data 4 occurs, countdown Z minutes based on a TTL (expiration time) mechanism in redis, then after Z minutes, the participating bank 1 performing an abnormal circuit breaker is to be automatically removed from redis.

20 **[0064]** In a fourth step, sample data 5 of the participating bank 1 generates data in the Error state at 12:01 on November 9, 2021, and no sample data in the Error state occurs in subsequent Y minutes which is ten minutes, then it is not recorded that the participating bank 1 performs an abnormal circuit breaker.

[0065] In a fifth step, sample data 6 of participating bank 2 generates data in the Error state at 12:03 on November 9, 2021, and no sample data in the Error state occurs in subsequent Y minutes which are ten minutes, then it is not recorded that the participating bank 2 performs an abnormal circuit breaker.

25 **[0066]** In some embodiments, after generating the multiple pieces of index data for the routing rule based on the full transaction chain monitoring information, the method further includes: generating index data related to a credit-granting ranking based on the full transaction chain monitoring information. The index data includes at least one of: a response rate, a loan success rate, a capital cost, and the credit-granting approval time limit.

30 **[0067]** Statistics data of the capital cost is obtained based on configuration items. The

capital cost is calculated based on the leading bank and the participating bank. An example is taken as follows:

in project 1, the leading bank is leading bank 1, the participating bank is participating bank 1, and the capital cost is 58%;

5 in project 2, the leading bank is leading bank 1, the participating bank is participating bank 2, and the capital cost is 46%; and

in project 3, the leading bank is leading bank 2, the participating bank is participating bank 1, and the capital cost is 56%.

[0068] Specifically, in an example, the loan success rate is calculated based on all pieces of data, rather than a loan success rate in last X days. The loan success rate is calculated by the following equation:

loan success rate= $\text{sum}(\text{number of successful loans})/\text{sum}(\text{number of loans})$.

[0069] Specifically, the index data of credit-granting approval time limit is obtained as follows. Based on the leading bank and the participating bank, data in a final state that may be directly used by a routing platform is obtained by summarizing pieces of monitored data based on the following equation, and the data in the final state is written into Elasticsearch:.

a credit-granting approval time limit in last X days= $\text{sum}(\text{an ending time instant of each of credit-granting transactions in the last X days}-\text{a starting time instant of the credit-granting transaction in the last X days})/\text{sum}(\text{the number of credit-granting transactions in the last X days})$.

[0070] The credit-granting transaction is the integrated and assembled credit-granting data.

[0071] After filtering out, based on the routing rule corresponding to the leading bank and the verification index data of the multiple participating banks, the participating bank that is not suitable for the leading bank, the method further includes the following operations.

25 **[0072]** The index data related to the credit-granting ranking is obtained.

[0073] A credit-granting score of each of the participating banks is determined by using the following equation:

a credit-granting score of a participating bank= $(\text{a first weight}*(1+\text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)})+\text{a second$

weight*(1+b* a sequence number of the participating bank ranking in an ascending order based on min(response rate))+a third weight*(1+c*a sequence number of the participating bank ranking in a descending order based on max(loan success rate))+a fourth weight*(1+d*a sequence number of the participating bank ranking in an ascending order based on min(credit-granting approval time limit))/4.

[0074] In the above equation, a sum of the first weight, the second weight, the third weight and the fourth weight is 1. min(capital cost) represents a minimum capital cost, min(response rate) represents a minimum response rate, max(loan success rate) represents a maximum loan success rate, and min (credit-granting approval time limit) represents a minimum credit-granting approval time limit. The sequence number is a natural number acquired by ranking the participating bank in an ascending order. The sequence number of the first participating bank ranked in the ascending order is 1, the sequence number of the second participating bank ranked in the ascending order is 2, the sequence number of the third participating bank ranked in the ascending order is 3, the sequence number of the fourth participating bank ranked in the ascending order is 4, the sequence number of the fifth participating bank ranked in the ascending order is 5, and so on. The sequence numbers of the participating banks ranked in the ascending order of the min (capital cost) indicate that: all the participating banks are ranked in an ascending order based on minimum capital costs of the participating banks to obtain sequence numbers of the participating banks.

[0075] A priority of the available participating bank is determined based on the credit-granting score of each of the participating banks. A lower credit-granting score indicates a higher priority.

[0076] In an embodiment, values of a parameter a, a parameter b, a parameter c, and a parameter d are equal to 0.1. In another embodiment, the values of the parameter a, the parameter b, the parameter c, and the parameter d may be different, ranging from 0.1 to 0.5.

[0077] In another embodiment, the above equation may be obtained only based on one, two or three of the response rate, the loan success rate, the capital cost, and the credit-granting approval time limit. Accordingly, there may be one, two or three weights.

[0078] For example, the credit-granting score of each of the participating banks may be calculated by using any one of the following equations:

a credit-granting score of a participating bank=(a first weight*(1+a*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+a second weight*(1+b* a sequence number of the participating bank ranking in an ascending order based on min(response rate))+a third weight*(1+c*a sequence number of the participating bank ranking in a descending order based on max(loan success rate)))/3

where a sum of the first weight, the second weight, and the third weight is 1;

a credit-granting score of a participating bank=(a first weight*(1+a*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+a second weight*(1+b* a sequence number of the participating bank ranking in an ascending order based on min(response rate))+a fourth weight*(1+d*a sequence number of the participating bank ranking in an ascending order based on min(credit-granting approval time limit)))/3

where a sum of the first weight, the second weight, and the fourth weight is 1;

a credit-granting score of a participating bank=(a second weight*(1+b* a sequence number of the participating bank ranking in an ascending order based on min(response rate))+a third weight*(1+c*a sequence number of the participating bank ranking in a descending order based on max(loan success rate))+a fourth weight*(1+d*a sequence number of the participating bank ranking in an ascending order based on min(credit-granting approval time limit)))/3

where a sum of the second weight, the third weight and the fourth weight is 1;

a credit-granting score of a participating bank=(a first weight*(1+a*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+a third weight*(1+c*a sequence number of the participating bank ranking in a descending order based on max(loan success rate))+a fourth weight*(1+d*a sequence number of the participating bank ranking in an ascending order based on min(credit-granting approval time limit)))/4

where a sum of the first weight, the third weight, and the fourth weight is 1;

a credit-granting score of a participating bank=(a first weight*(1+a*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+a second weight*(1+b* a sequence number of the participating bank ranking in an ascending order based on min(response rate)))/2

where a sum of the first weight and the second weight is 1;

a credit-granting score of a participating bank=(a first weight*(1+a*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+a third weight*(1+c*a sequence number of the participating bank ranking in a descending order based on max(loan success rate)))/2

where a sum of the first weight and the third weight is 1; and

a credit-granting score of a participating bank=a first weight*(1+a*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))

where the first weight is 1.

10 **[0079]** In some embodiments, the operation of sending a credit-granting application transaction to the available participating bank in step S180 includes:

in a case that a credit-granting sending mode in product configuration information of the leading bank is a mode of finding multiple joint parties, sending a credit-granting application transaction to each of available participating banks, and receiving a return result from each of the available participating banks; and

15 in a case that a credit-granting sending mode in product configuration information of the leading bank is a mode of finding a joint party one by one, ranking the available participating banks in an ascending order based on credit-granting scores of the participating banks, and sending credit-granting application transactions to the available participating banks one by one, where if a current participating bank returns a credit-granting failure result, a credit-granting application transaction is sent to a subsequent participating bank, and if a current participating bank returns a credit-granting success result, no credit-granting application transaction is sent to a subsequent participating bank.

[0080] The above technical solutions have the following beneficial technical effects.

25 **[0081]** According to the technical solutions in the embodiments of the present disclosure, complete information, in a form of integrated data, of a current transaction application is displayed to the user, avoiding selecting the desired data from multiple pieces of transaction information, thereby reducing the data usage complexity.

[0082] According to the technical solutions in the embodiments of the present disclosure,

for a transaction of a cooperative party, customer information of the transaction, initiation time instant of the transaction, ending time instant of the transaction and a transaction result of the transaction returned by the cooperative party are included in the integrated data, thereby improving the data intuitiveness

5 **[0083]** According to the embodiments of the present disclosure, a credit-granting distribution mode defined by a leading bank is realized, which can be changed at any time based on the market situation.

10 **[0084]** According to the embodiments of the present disclosure, in the way of simultaneously determining multiple cooperative parties, a leading party can connect with multiple cooperative parties and select a cooperative party based on credit-granting results returned by the multiple cooperative parties.

[0085] According to the embodiments of the present disclosure, in the way of determining a cooperative party one by one, a leading party can only connect with one cooperative party at a time, and cooperate with a cooperative party after the cooperative party is approved.

15 **[0086]** Second embodiment

[0087] Figure 2 is a flow chart of a data processing method for joint loan according to an embodiment of the present disclosure. As shown in Figure 2, the method includes the following steps S201 to S210.

[0088] In step S201, multiple pieces of transaction data of a transaction are obtained.

20 **[0089]** In step S202, data distribution processing is performed on the multiple pieces of transaction data to determine multiple pieces of normal transaction data.

[0090] In step S203, integration and assembly processing is performed on multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information.

25 **[0091]** In step S204, multiple pieces of index data related to a credit-using ranking are generated based on the full transaction chain monitoring information, where the multiple pieces of index data related to the a credit-using ranking include at least one of: a response rate, a loan success rate, a capital cost, and a credit-using approval time limit.

[0092] In step S205, credit-using application information is received.

[0093] In step S206, a corresponding credit-granting application result is obtained based on the credit-using application information.

[0094] In step S207, the multiple pieces of index data related to the credit-using ranking are
5 obtained.

[0095] In step S208, credit-using scores of participating banks are calculated based on the multiple pieces of index data related to the credit-using ranking.

[0096] In step S209, the participating banks are ranked in an ascending order based on the credit-using scores of the participating banks.

10 **[0097]** In step S210, a credit-using application transaction is sent to each of the participating banks based on the ascending order.

[0098] In some embodiments, the operation of performing integration and assembly processing on multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is
15 processed, to obtain full transaction chain monitoring information in step S203 includes:

for each of the multiple pieces of transaction data,

determining whether the piece of transaction data exists in a message queue based on a unique transaction ID, performing analysis processing on the piece of transaction data in a case that the piece of transaction data does not exist in the message queue, and skipping the
20 piece of transaction data in a case that the piece of transaction data exists in the message queue;

in performing analysis processing on the piece of transaction data, labeling the piece of transaction data by:

labeling the piece of transaction data with a first mark in a case that the piece of
25 transaction data is in a first final state, where the first final state is a state in which a receiver returns a processing result of the transaction, and both a transaction starting time instant and a transaction ending time instant exist;

labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in an initial state, where the initial state is a state in which a receiver

returns that the transaction is in a processing state, and a transaction starting time instant exists and a transaction ending time instant does not exist; and

labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in a second final state, where the second final state is a state in which a receiver returns a processing result of the transaction, and a transaction ending time instant exists and a transaction starting time instant does not exist;

obtaining transaction data labeled with the second mark, and merging transaction states, transaction starting time instants, transaction ending time instants, codes of a leading bank, codes of a participating bank, types of a customer certificate, the numbers of the customer certificate, application numbers, and credit-using numbers of all transaction data labeled with the second label; and

determining, in a case that the merged transaction data is in the first final state, the merged transaction data as the full transaction chain monitoring information.

[0099] In some embodiments, the operation of calculating credit-using scores of participating banks based on the multiple pieces of index data related to the credit-using ranking in step S208 includes the credit-using scores of the participating banks by using the following equation based on the multiple pieces of index data related to the credit-using ranking:

a credit-using score of a participating bank=(a first weight*(1+a*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+a second weight*(1+b* a sequence number of the participating bank ranking in an ascending order based on min(response rate))+a third weight*(1+c*a sequence number of the participating bank ranking in a descending order based on max(loan success rate))+a fourth weight*(1+d*a sequence number of the participating bank ranking in an ascending order based on min(credit-using approval time limit)))/4

where a sum of the first weight, the second weight, the third weight and the fourth weight is 1.

[0100] In an embodiment, values of a parameter a, a parameter b, a parameter c, and a parameter d are equal to 0.1. In another embodiment, the values of the parameter a, the parameter b, the parameter c, and the parameter d may be different, ranging from 0.1 to 0.5.

[0101] In order to reduce differences between scores caused by the ascending order, the above parameters are set to a small number of 0.1. The parameters may be set to other numbers as small as possible. The first weight, the second weight, the third weight, and fourth weight may be the same or different, as long as the sum of the four weights is equal to 1.

5 **[0102]** In some embodiments, based on the leading bank and the participating banks, the credit-using approval time limit is data in a final state that may be directly used by a routing platform and is obtained by summarizing pieces of monitored data based on the following equation, and the data in the final state is written into Elasticsearch:

10 a credit-using approval time limit= $\frac{\text{sum}(\text{an ending time instant of a credit-using transaction}-\text{a starting time instant of the credit-using transaction})}{\text{sum}(\text{the pieces of monitored data of the credit-using transaction})}$.

[0103] The above technical solutions have the following beneficial technical effects.

15 **[0104]** According to the embodiments of the present disclosure, the leading bank can adjust an overall rule determination by adjusting a weight at any time based on a rule of the leading bank.

[0105] According to the embodiments of the present disclosure, different leading banks have independent configurations and do not affect each other. It is allowed to generate an equation for calculating a credit-using score of a participating bank based on different weights and different combinations of the capital cost, the response rate, the loan success rate, and the credit-using approval time limit.

[0106] Third embodiment

25 **[0107]** Figure 3 is a schematic diagram showing an overall structure of a data processing method for joint loan according to an embodiment of the present disclosure. The method is performed by a joint loan platform. The joint loan platform provides multiple services, such as a transaction intelligent matching and distribution service, a transaction monitoring service, an internal gateway service and an external gateway service. These services may be respectively deployed on separate servers. Alternatively, all the services may be deployed on one server. Alternatively, the internal gateway service, the external gateway service and the transaction intelligent matching and distribution service may be deployed on one server. A gateway provides the internal gateway service and the external gateway service. In some

embodiments, transaction data of the gateway is obtained from the transaction intelligent matching and distribution service. In an embodiment, for the transaction monitoring service, a monitoring method is performed to generate routing index data for the transaction intelligent matching and distribution service. During the transaction intelligent matching and distribution service, an intelligent routing method is performed to generate sample data for the monitoring method. Based on a combination of the transaction monitoring service and the transaction intelligent matching and distribution service, a closed loop of data usage and data generation may be formed, thereby realizing the joint loan service. In another embodiment, a gateway may obtain transaction data without forming the closed loop. As shown in Figure 3, a processing method performed by the joint loan platform includes the following steps S1 to S6.

[0108] In step S1, a gateway sends each of pieces of generated transaction data to a transaction monitoring service, and the transaction monitoring service receives the piece of transaction data sent by the gateway and writes the piece of transaction data into a message queue.

[0109] In step S2, data distribution processing is performed on each of pieces of transaction data in the message queue.

[0110] Specifically, a large amount of transaction data is generated during the joint loan processing upstream and downstream transactions. One downstream service has a great pressure to process all the transaction data. In order to reduce the pressure of the downstream transaction monitoring service in collecting and processing sample data, data distribution is performed at data source and a heavy data stream is divided into small branch data streams based on a state of the data according to the embodiment of the present disclosure. The data distribution may be performed by performing the following steps S21 and S22.

[0111] In step S21, based on the transaction result encapsulation object TradeResultDto uniformly encapsulated by the transaction, a transaction in an Error state is labeled as abnormal transaction data, and an abnormal transaction data processing is performed. The abnormal transaction data processing includes the following step S3. Each of transactions corresponds to an instance of a transaction result encapsulation object.

[0112] In step S22, based on the transaction result encapsulation object TradeResultDto uniformly encapsulated by the transaction, a transaction in a non-Error state is labeled as normal transaction data, and a normal transaction data processing is performed. The normal

transaction data processing includes the following step S4.

[0113] In step S3, the abnormal transaction data processing is performed.

[0114] In step S31, in processing a sample labeled as "abnormal data", in a case that the number of occurrences of abnormal transaction data reaches a predetermined number in a predetermined time period, the transaction is labeled as a circuit-breaker transaction. The abnormal transaction data includes data that is not successfully sent in a case including but not limited to:

a case in which a transaction fails due to that the transaction has not been sent successfully caused by network jitter and network disconnection of the joint loan platform;

10 a case in which a transaction fails due to that the transaction cannot be successfully sent caused by abnormal outbound gateway service of the joint loan platform;

a case in which a transaction link is not complete due to that a receiver fails to respond to a transaction in a predetermined time period; and

15 a case in which a transaction link is not complete due to that a receiver actively performs a circuit-breaker operation on the transaction.

[0115] In step S32, a circuit breaker notification is sent to the gateway. Specifically, the joint loan platform is informed that a circuit breaker occurs on a transaction between the leading bank and a participating bank, the transaction is no longer triggered. Specifically, the circuit breaker occurs on an interface of the transaction.

20 **[0116]** In step S33, the circuit breaker notification is sent to a related party outside the gateway. Specifically, the circuit breaker notification may be sent through a short message, an e-mail, a speech communication or the like to inform a relevant person that a circuit breaker occurs on a certain type of transaction between a leading bank and a participating bank.

25 **[0117]** In step S4, the normal transaction data processing is performed. The normal transaction data processing includes performing the integration and assembly processing on the normal transaction.

[0118] In this step, the integration and assembly processing is performed on a sample labeled as "normal transaction data". In this embodiment, a credit-granting application transaction, a credit-using approval transaction, a loan transaction and other transactions of a

participating bank are all asynchronous transactions. Thus, the transaction monitoring service may perform integration and assembly processing on transaction data of a transaction from a time instant when a transaction request is initiated to a time instant when the transaction is processed, and combine multiple requests into a piece of complete transaction data. The above
5 processing includes the following steps S41 to S45.

[0119] In step S41, in order to avoid repeated data processing, it is determined whether a piece of transaction data exists in a message queue, such as redis (remote dictionary server), based on a unique transaction ID. In a case that the piece of transaction data does not exist in the message queue, an operation of analysis processing in step S42 is triggered. In a case that
10 the piece of transaction data exists in the message queue, the piece of transaction data is skipped. Each of pieces of transaction data may be labeled by the analysis processing.

[0120] In step S42, in performing the analysis processing on the piece of transaction data, the piece of transaction data is labeled by performing the following step a, step b, and step c.

[0121] In step a, in a case that the piece of transaction data is in a final state, that is, a
15 receiver definitely returns a processing result of the transaction including a successful processing result and a failed processing result, and both a starting time instant and an ending time instant of the transaction exist, the piece of transaction data is labeled as "unique".

[0122] In step b, in a case that the piece of transaction data is in an initial state, that is, a receiver returns that the transaction is in a processing state, and the starting time instant of the
20 transaction exists and the ending time instant of the transaction does not exist, the piece of transaction data is labeled as "combination".

[0123] In step c, in a case that the piece of transaction data is in the final state, that is, a receiver definitely returns a processing result of the transaction including a successful processing result and a failed processing result,, and the ending time instant of the transaction
25 exists and the starting time instant of the transaction does not exist, the piece of transaction data is labeled as "combination".

[0124] In step S43, all data labeled as "combination" are obtained and grouped based on a field of jlsLeaderTradeId and a field of jlsUniteTradeId. Based on a rule that data in the final state covers data in a non-final state (that is, data in the initial state) and multiple pieces of
30 data in the final state cover in a chronological order of event processing, transaction states,

transaction starting time instants, transaction ending time instants, codes of a leading bank, codes of a participating bank, the types of a customer certificate, the numbers of the customer certificate, application numbers, and credit-using numbers of the multiple pieces of data labeled as "combination" are merged. In a case that the merged data is in a "final state", and both a transaction starting time instant and a transaction ending time instant of the merged data exist, the merged data is determined as the full transaction chain monitoring information, and a "total transaction time period" is calculated and written into a first index monitor_biz_trans_detail_collect_index of elasticsearch. In a case that the merged data is not in a "final state", or a transaction starting time instant of the merged data does not exist, or a transaction ending time instant of the merged data does not exist, another piece of data labeled as "combination" is waited until the piece of data labeled as "combination" is determined as the full transaction chain monitoring information. Elasticsearch is a distributed free open source search and analysis engine for all types of data, including text data, digital data, geospatial data, structured data and unstructured data. The transaction monitoring service writes the obtained sample data, the integrated monitored data and the index data into Elasticsearch.

[0125] Specifically, jlsLeaderTradeId is a unique transaction ID of a leading bank. Each time the leading bank initiates a transaction, the joint loan platform generates a unique ID. JlsUniteTradeId is a unique transaction ID of a participating bank. Each time a transaction is initiated for the participating bank, the joint loan platform generates a unique ID. The two fields of jlsLeaderTradeId and JlsUniteTradeId are unique IDs generated by the joint loan platform based on transactions, and thereby the following advantages can be achieved.

[0126] (1) The transaction IDs are internally generated, completely avoiding repeated transaction IDs due to influences of external factors.

[0127] (2) The resources can be saved. If a unique transaction is represented by a combination of multiple fields in the transaction, the length of the overall data is longer than the length of the internally generated transaction ID, resulting in consuming additional resources.

[0128] (3) Since only one field represents a unique transaction ID, the transaction ID is simple and understandable in a case where one leading bank corresponds to multiple participating banks.

[0129] Specifically, the rule that multiple pieces of data in the final state cover in a chronological order of event processing include: covering the multiple pieces of data in the final state in an ascending order of the event processing. That is, data processed later covers data processed earlier.

5 **[0130]** For example, in a case that multiple pieces of data in the final state are processed at the following time instants:

data 1 in the final state: 15:32 on October 25, 2021

data 2 in the final state: 15:33 on October 25, 2021

data 3 in the final state: 16:00 on October 25, 2021

10 then, in merging data, the data 2 in the final state covers the data 1 in the final state, and the data 3 in the final state covers the data 2 in the final state.

[0131] Since it cannot be ensure that all fields in different pieces of data in the final state are complete, coverage is performed rather than replacement.

15 **[0132]** In step S44, the data labeled as "unique" is obtained, and a "total transaction time period" is calculated and written into a first index monitor_biz_trans_detail_collect_index of elasticsearch.

[0133] In step S45, a transaction time period for each of pieces of transaction data is calculated, and is recorded in a second index monitor_sys_trans_detail_collect_index of Elasticsearch. The calculated transaction time period is a time period of a single transaction
20 and is a technical field for providing a monitoring basis for subsequent system operation and maintenance. The calculations in steps S44 and S45 may be performed in performing analysis and data integration on a single transaction.

[0134] The above calculations are performed by using the following equations:

25 a total transaction time period=an ending time instant of a transaction-a starting time instant of the transaction; and

a transaction time period=a response time instant-a request time instant.

[0135] In step S5, with the continuous generation of the full transaction chain monitoring information, the transaction monitoring service regularly obtains full transaction chain monitoring information and generates index data for the transaction intelligent

matching/distribution service based on the full transaction chain monitoring information.

[0136] The sample data is data collected by the transaction monitoring service from the original transaction data generated in each of transactions. The content of the sample data in the present disclosure is the same as the content of the transaction data, which is called differently in different scenarios.

[0137] The monitored data is data of a complete transaction, and is obtained by performing integration and assemble on multiple pieces of sample data.

[0138] The index data is data in the final state that may be directly used by the routing platform and is generated by collecting monitored data based on a rule of the routing platform.

[0139] Specifically, the index data is calculated by using the following equations:

a credit-granting rejection rate in the last X months=the number of credit-granting rejections in the last X months/the number of credit-grantings in the last X months;

a credit-granting approval rate in last X months=the number of credit-granting approvals in the last X months/the number of credit-grantings in the last X months; and

a record indicating a customer is rejected in last X days=a transaction date when the customer is rejected is recorded with a leading bank, participating banks, a certificate type and a certificate number as a grouping condition.

Exemplary Data

Data	Leading bank	Participating bank	Certificate type	Certificate number	Transaction date
Monitored data 1	Leading bank 1	Participating bank 1	Identity card	Number 1	October 8, 2021
Monitored data 2	Leading bank 2	Participating bank 2	Identity card	Number 1	August 3, 2021
Monitored data 3	Leading bank 3	Participating bank 3	Identity card	Number 2	October 1, 2021
Monitored data 4	Leading bank 4	Participating bank 4	Identity	Number 1	September 1, 2021

			card		
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[0140] It can be seen from the above data in example that: (1) the monitored data 1 and the monitored data 4 are data of a same customer; (2) although the leading bank, the certificate type and the certificate number in the monitored data 2 are the same as the leading bank, the certificate type and the certificate number in the monitored data 1 and the leading bank, the certificate type and the certificate number in the monitored data 4, the customer of the monitored data 2 is different from the customer of the monitored data 1 and the customer of the monitored data 4 due to that the participating bank in the monitored data 2 is different from the participating bank in the monitored data 1 and the participating bank in the monitored data 4; and (3) the customer of the monitored data 3 is different from the customer of the monitored data 1 and the customer of the monitored data 4.

[0141] A loan success rate in last X days=number of successful loans in the last X days/the total number of loans in the last X days.

[0142] A loan approval time limit=sum(a total time period of each of loan approvals)/the total number of loan approvals in the last X days.

[0143] In step S6, the transaction intelligent matching and distribution service determines all participating banks suitable for a leading bank based on sample data of the participating banks processed by the transaction monitoring service according to a routing rule configured by the leading bank. The above process includes the following steps S61 and S62.

[0144] In step S61, the transaction intelligent matching and distribution service obtains parameter configurations configured by the user according to the leading bank of the transaction. The following configurations are stored in Mysql and redis. In this step, the parameter configurations in redis are obtained firstly, and in a case that no parameter configurations are stored in redis, the parameter configurations in Mysql are obtained. Examples are as follows.

Configuration 1: product configuration information example of leading bank

	Credit-granting distribution mode	Contribution proportion of participating bank	Special capital cost	Risk sharing mode	Financing party
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Product 1	Find multiple cooperative parties	70%	6.5%	Risk sharing	xxx insurance
Product 2	Find a cooperative party one by one	60%	None	Compensation by leading bank	None

Configuration 2: project configuration information example of leading bank

	Suitable participating bank	Suitable region	Access condition 1	Access condition 2	Access condition 3...
Project 1	Participating bank 1	Beijing	Not less than 18 years of age and not more than 60 years of age	None	None
Project 2	Participating bank 2	China	Less than 100,000 in amount	Not less than 18 years of age and not more than 60 years of age	...
Project 3	Participating bank 3	Beijing, Tianjin, Shandong	Period less than 36	None	None

[0145] In the table corresponding to configuration 2, the "Access condition 3" is followed by an ellipsis indicating that more access condition configurations are supported. It is required to be met all configured access conditions. For example, one access condition is configured for the project 1, then it is only required to meet the access condition 1; and multiple access conditions are configured for the project 2, then it is required to meet the access condition 1, the access condition 2, the access condition 3, and the like.

Configuration 3: routing configuration information example of leading bank

	Trial bank rule	Routing rule 1	Routing rule 2	Routing rule N...
Leading bank	Non-trial bank	Credit-granting approval rate in last month>80%	A customer is rejected in last 30 days	...

Configuration 4: routing switch configuration information example of leading bank

Participating bank	Routing Switch
Participating bank 1	Open
Participating bank 2	Open
Participating bank 3	Closed

[0146] In step S62, the index data is calculated based on the rules, and all participating banks meeting the requirements of the leading bank are determined based on the routing rules. Detail descriptions are provided below by respectively taking a credit-granting application transaction and a credit-using approval transaction as an example.

[0147] As shown in Figure 4, transaction 1 is a rule chain process suitable for a credit-granting application transaction. The process includes the following steps S411 to S420.

[0148] In step S411 (that is, step 1 of transaction 1), a credit-granting application is received, and it is determined whether configuration items of "Configuration 1: product configuration of leading bank" are complete based on the leading bank of the credit-granting application. A default configuration is used in a case that the configuration items are incomplete.

[0149] In step S412 (that is, step 2 of transaction 1), all project information of "Configuration 2: project configuration of leading bank" of the leading bank is obtained (queried). The project information includes: participating banks related to the project and asset access conditions.

[0150] In step S413 (that is, step 3 of transaction 1), participating banks configured as "closed" in previous step are filtered out based on configurations of routing switches in

"Configuration 4: routing switch configuration of leading bank".

[0151] In step S414 (that is, step 4 of transaction 1), based on the asset access conditions obtained in step 2, all the participating banks obtained in the previous step that do not meet the asset access conditions are filtered out. The asset access conditions are included in Configuration 2, and have been obtained in step S512.

[0152] In step S415 (that is, step 5 of transaction 1), routing rules configured based on "Configuration 3: routing configuration of leading bank" is obtained based on the leading bank of the credit-granting application.

[0153] In step S416 (that is, step 6 of transaction 1), based on the routing rules obtained in step 5, statistical index data corresponding to the routing rules is obtained (queried) from the transaction monitoring service. The statistical index data includes but not limited to:

index data 1: an abnormal circuit breaker, where the abnormal circuit breaker is a measure that an initiator actively suspends a transaction to control the risk after multiple transaction errors occur due to a network problem, unavailability of a service, and the like, a participating bank at which an abnormal circuit breaker occurs is to be recorded in redis, and the participating bank, as long as being found in redis in performing a filtering operation, is directly filtered out and thereby does not participate in subsequent transactions;

index data 2: a credit-granting approval time limit;

index data 3: a record indicating whether a customer is rejected in last X days;

index data 4: a credit-granting approval rate in last X months; and

index data 5: a credit-granting rejection rate in the last X months.

[0154] In step S417 (that is, step 7 of transaction 1), the routing rules obtained in step 5 are performed one by one, each of the routing rules corresponds to the statistical data (index data) obtained in step 6, and the participating banks obtained in step 4 that do not meet the routing rules are filtered out.

[0155] For example, in a case that routing rule 1 is configured that a credit-granting approval rate in last one month is more than 80%, routing rule 2 is configured that a customer is rejected in the last 30 days, routing rule 3 is configured as the abnormal circuit breaker, routing rule 4 is configured that a credit-granting rejection rate in the last one month is less

than 10%, and it is assumed that a current transaction application date is November 9, 2021, then examples of rule data of participating banks are shown in the following table:

Participating bank	Data of routing rule 1	Data of routing rule 2	Data of routing rule 3	Data of routing rule 4
Participating bank 1	70%	December 1, 2020	No circuit breaker	30%
Participating bank 2	92%	October 1, 2021	No circuit breaker	8%
Participating bank 3	99%	November 2, 2021	Circuit breaker	1%
Participating bank 4	95%	None	No circuit breaker	5%

[0156] The routing rules are performed according to the following four steps.

[0157] In a first step, routing rule 1 is performed. In a case that a credit-granting approval rate in last one month of participating bank 1 is less than 80%, the participating bank 1 is filtered out, and participating bank 2, participating bank 3, and participating bank 4 are retained for a next filtering process.

[0158] In a second step, the second routing rule is performed. In a case that the customer is rejected by participating bank 3 in the last 30 days, the participating bank 3 is filtered out, and participating bank 2 and participating bank 4 are retained for a next filtering process.

[0159] In a third step, routing rule 3 is performed. In a case that no abnormal circuit breaker occurs on any one of the retained participating banks, the participating bank 2 and participating bank 4 are retained for a next filtering process.

[0160] In a fourth step, routing rule is performed. In a case that a credit-granting rejection rate in the last one month of each of the retained participating banks is less than 10%, the participating bank 2 and participating bank 4 are retained.

[0161] In step S418 (that is, step 8 of transaction 1), index data related to a credit-granting ranking is obtained from the transaction monitoring service, a credit-granting score of each of the participating banks is calculated by using the following equation, and the participating banks may be ranked in an ascending order based on the credit-granting score of each of the participating banks:

a credit-granting score of a participating bank=(weight 1*(1+0.1*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+weight

$$\frac{2 \times (1 + 0.1 \times \text{a sequence number of the participating bank ranking in an ascending order based on min(response rate)}) + \text{weight 3} \times (1 + 0.1 \times \text{a sequence number of the participating bank ranking in a descending order based on max(loan success rate)}) + \text{weight 4} \times (1 + 0.1 \times \text{a sequence number of the participating bank ranking in an ascending order based on min(credit-granting approval time limit)})}{4}$$

where weight 1+weight 2+weight 3+weight 4=1.

[0162] In another embodiment, the credit-granting score of the participating bank may be calculated based on one, two or three of the capital cost, the response rate, the loan success rate and the credit-granting approval time limit. Accordingly, the number of weights may be one, two or three. If the number of the weight is one, the weight is 1. If the number of weights is two, a sum of the two weights is 1. If the number of weights is three, a sum of the three weights is 1.

[0163] Examples of calculating the credit-granting score of the participating bank based on one piece of index data are as following:

a credit-granting score of a participating bank = $\text{weight 1} \times (1 + 0.1 \times \text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)})$;

a credit-granting score of a participating bank = $\text{weight 2} \times (1 + 0.1 \times \text{a sequence number of the participating bank ranking in an ascending order based on min(response rate)})$;

a credit-granting score of a participating bank = $\text{weight 3} \times (1 + 0.1 \times \text{a sequence number of the participating bank ranking in a descending order based on max(loan success rate)})$; and

a credit-granting score of a participating bank = $\text{weight 4} \times (1 + 0.1 \times \text{a sequence number of the participating bank ranking in an ascending order based on min(credit-granting approval time limit)})$.

[0164] Examples of calculating the credit-granting score of the participating bank based on two pieces of index data are as following:

a credit-granting score of a participating bank = $(\text{weight 1} \times (1 + 0.1 \times \text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)}) + \text{weight 2} \times (1 + 0.1 \times \text{a sequence number of the participating bank ranking in an ascending order based on min(response rate)})) / 2$;

a credit-granting score of a participating bank= $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)}) + \text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on max(loan success rate)})) / 2$;

5 a credit-granting score of a participating bank= $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)}) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(credit-granting approval time limit)})) / 2$;

10 a credit-granting score of a participating bank= $(\text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(response rate)}) + \text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on max(loan success rate)})) / 2$;

15 a credit-granting score of a participating bank= $(\text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(response rate)}) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(credit-granting approval time limit)})) / 2$; and

20 a credit-granting score of a participating bank= $(\text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on max(loan success rate)}) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(credit-granting approval time limit)})) / 2$.

[0165] Examples of calculating the credit-granting score of the participating bank based on three pieces of index data are as following:

25 a credit-granting score of a participating bank= $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)}) + \text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(response rate)}) + \text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on max(loan success rate)})) / 3$;

30 a credit-granting score of a participating bank= $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)}) + \text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based$

on $\min(\text{response rate}) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{credit-granting approval time limit}))) / 3;$

a credit-granting score of a participating bank = $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{capital cost})) + \text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on } \max(\text{loan success rate})) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{credit-granting approval time limit}))) / 3;$ and

a credit-granting score of a participating bank = $(\text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{response rate})) + \text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on } \max(\text{loan success rate})) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{credit-granting approval time limit}))) / 3.$

[0166] The credit-granting approval time limit is calculated by using the following equation:

a total transaction time period = an ending time instant of a transaction - a starting time instant of the transaction.

The credit-granting approval time limit is equal to the total transaction time period of the credit-granting approval transaction.

[0167] The following index data are involved: index data 1, that is, the response rate; index data 2, that is, the loan success rate; index data 3, that is, the capital cost; and index data 4, that is, the credit-granting approval time limit.

[0168] In step S419 (that is, step 9 of transaction 1), based on the credit-granting distribution mode configured in "Configuration 1: product configuration of leading bank", a credit-granting application transaction is sent to an available participating bank (each of obtained participating banks is an available participating bank) according to the order of the participating banks obtained in step 8. The credit-granting application transaction is sent to the available participating bank by:

in a mode of finding multiple joint parties, sending a credit-granting application transaction to each of the available participating banks obtained in step 8, and receiving a return result from each of the available participating banks; and

in a mode of finding a joint party one by one, ranking the available participating banks obtained in step 8 in an ascending order based on credit-granting scores of the participating banks, and sending credit-granting application transactions to the available participating banks one by one, where if a current participating bank returns a credit-granting failure result, a credit-granting application transaction is sent to a subsequent participating bank, and if a current participating bank returns a credit-granting success result, no credit-granting application transaction is sent to a subsequent participating bank.

[0169] In step S420 (that is, step 10 of transaction 1), in a case that there is no available participating obtained after performing the filtering operation in step 8, the leading bank is informed that there is no available participating bank.

[0170] As shown in Figure 5, transaction 2 is a rule chain process suitable for a credit-using transaction. Transaction 2 is a credit-using transaction, thus the participating bank passing the credit-granting approval may be directly used without filtering the participating bank. The process may include the following steps S511 to S514.

[0171] In step S511 (that is, step 1 of transaction 2), the transaction intelligent matching and distribution service in the joint loan platform determines whether a credit-using application sent by a leading bank meets a transaction requirement, and performs subsequent operations in a case that the credit-using application meets the transaction requirement. Specifically, the transaction intelligent matching and distribution service determines whether the fields of the credit-using application are complete. The fields of the credit-using application include but are not limited to: a credit-granting application number field, a credit-using application number field, a leading bank code field, a contract number field, and a load number field.

[0172] In step S512 (that is, step 2 of transaction 2), the transaction intelligent matching and distribution service in the joint loan platform associates (queries) a corresponding credit-granting application result based on information of the credit-using application. The credit-granting application result is obtained from the credit-granting application transaction in transaction 1, and is one-to-one associated with a credit-granting application number sent in the credit-using application transaction in transaction 2. The credit-granting application result is not relevant to the transaction intelligent matching and distribution service and the transaction monitoring service, and is only included in a message sent to a participating bank.

[0173] In step S513 (that is, step 3 of transaction 2), the transaction intelligent matching and

distribution service in the joint loan platform obtains index data related to a credit-using ranking from the transaction monitoring service, calculates a credit-using score of each of the participating banks by using the following equation, and then ranks the participating banks in an ascending order based on the credit-using score of each of the participating banks:

5 a credit-using score of a participating bank=(weight 1*(1+0.1*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+weight 2*(1+0.1* a sequence number of the participating bank ranking in an ascending order based on min(response rate))+weight 3*(1+0.1*a sequence number of the participating bank ranking in an descending order based on max(loan success rate))+weight 4*(1+0.1*a sequence
10 number of the participating bank ranking in an ascending order based on min(credit-using approval time limit)))/4

where weight 1+weight 2+weight 3+weight 4=1.

[0174] In another embodiment, the credit-using score of the participating bank may be calculated based on one, two or three of the capital cost, the response rate, the loan success
15 rate and the credit-granting approval time limit. Accordingly, the number of weights may be one, two or three. If the number of the weight is one, the weight is 1. If the number of weights is two, a sum of the two weights is 1. If the number of weights is three, a sum of the three weights is 1.

[0175] Examples of calculating the credit-using score of the participating bank based on
20 one piece of index data are as following:

a credit-using score of a participating bank=weight 1*(1+0.1*a sequence number of the participating bank ranking in an ascending order based on min(capital cost));

a credit-using score of a participating bank=weight 2*(1+0.1* a sequence number of the participating bank ranking in an ascending order based on min(response rate));

25 a credit-using score of a participating bank=weight 3*(1+0.1*a sequence number of the participating bank ranking in a descending order based on max(loan success rate)); and

a credit-using score of a participating bank=weight 4*(1+0.1*a sequence number of the participating bank ranking in an ascending order based on min(credit-using approval time limit)).

30 **[0176]** Examples of calculating the credit-using score of the participating bank based on

two pieces of index data are as following:

a credit-using score of a participating bank= $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)}) + \text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(response rate)})) / 2$;

a credit-using score of a participating bank= $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)}) + \text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on max(loan success rate)})) / 2$;

a credit-using score of a participating bank= $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)}) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(credit-using approval time limit)})) / 2$;

a credit-using score of a participating bank= $(\text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(response rate)}) + \text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on max(loan success rate)})) / 2$;

a credit-using score of a participating bank= $(\text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(response rate)}) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(credit-using approval time limit)})) / 2$; and

a credit-granting score of a participating bank= $(\text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on max(loan success rate)}) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(credit-using approval time limit)})) / 2$.

[0177] Examples of calculating the credit-using score of the participating bank based on three pieces of index data are as following:

a credit-using score of a participating bank= $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on min(capital cost)}) + \text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based$

on $\min(\text{response rate}) + \text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on } \max(\text{loan success rate})) / 3$;

a credit-using score of a participating bank = $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{capital cost})) + \text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{response rate})) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{credit-using approval time limit}))) / 3$;

a credit-using score of a participating bank = $(\text{weight } 1 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{capital cost})) + \text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on } \max(\text{loan success rate})) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{credit-using approval time limit}))) / 3$; and

a credit-using score of a participating bank = $(\text{weight } 2 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{response rate})) + \text{weight } 3 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in a descending order based on } \max(\text{loan success rate})) + \text{weight } 4 * (1 + 0.1 * \text{a sequence number of the participating bank ranking in an ascending order based on } \min(\text{credit-using approval time limit}))) / 3$.

[0178] The credit-using approval time limit is calculated by using the following equation:

a total transaction time period = an ending time instant of a transaction - a starting time instant of the transaction.

The credit-using approval time limit is equal to the total transaction time period of the credit-using approval transaction.

[0179] The index data related to the credit-using ranking includes: index data 1, that is, the response rate; index data 2, that is, the capital cost; index data 3, that is, the loan success rate; and index data 4, that is, the credit-using approval time limit.

[0180] In step S514 (that is, step 4 of transaction 2), a credit-using application transaction is sent to each of the participating banks ranked in step S313.

[0181] Fourth embodiment

[0182] Figure 6 is a functional block diagram of a computer-readable storage medium

according to an embodiment of the present disclosure. As shown in Figure 6, a computer-readable storage medium 600 is further provided according to an embodiment of the present disclosure. The computer-readable storage medium 600 stores a computer program 610. The computer program 610, when executed by a processor, causes the processor to perform any one of the data processing methods for joint loan according to the embodiments.

[0183] In a case that the integrated module/unit is implemented in the form of a software functional unit and sold or used as an independent product, the integrated module/unit may be stored in a computer-readable storage medium. Based on such understanding, the whole or parts of the flow of the method according to the above embodiments may be implemented by a computer program instructing related hardware. The computer program may be stored in a computer-readable storage medium. The computer program, when is executed by the processor, performs the method according the above embodiments. The computer program includes computer program codes. The computer program codes may be in a source code form, an object code form, an executable file form, or in some intermediate form. The computer-readable storage medium may include any entity, device or recording medium capable of storing the computer program codes, such as a U-disk, a portable hard disk, a magnetic disk, an optical disc, a computer memory, a read-only memory (ROM), a random access memory (RAM), an electric carrier signal, a telecommunication signal and a software distribution medium. In addition, the computer-readable storage medium may further be in other forms, such as a quantum memory and a grapheme memory. It should be noted that content of the computer-readable medium may be appropriately added or reduced according to the requirements of the legislation and patent practice in a judicial district. For example, in some judicial districts, the computer-readable medium does not include an electric carrier signal or a telecommunication signal according to the legislation and patent practice thereof.

[0184] Fifth embodiment

[0185] A computer device is further provided according to an embodiment of the present disclosure. As shown in Figure 7, the computer device includes one or more processors 701, a communication interface 702, a memory 703 and a communication bus 704. The processor 701, the communication interface 702 and the memory 703 communicate with each other through the communication bus 704.

[0186] The memory 703 stores a computer program.

[0187] The processor 701 is configured to execute the computer program stored in the memory 703 to:

obtain multiple pieces of transaction data of a transaction;

perform data distribution processing on the multiple pieces of transaction data to

5 determine multiple pieces of normal transaction data;

perform integration and assembly processing on multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information;

10 generate multiple pieces of index data for a routing rule based on the full transaction chain monitoring information;

obtain a routing rule corresponding to a leading bank;

obtain, based on the routing rule corresponding to the leading bank, verification index data of multiple participating banks corresponding to the routing rule corresponding to the
15 leading bank from the multiple pieces of index data;

filter out, based on the routing rule corresponding to the leading bank and the verification index data of the multiple participating banks, a participating bank that is not suitable for the leading bank to determine an available participating bank; and

send a credit-granting application transaction to the available participating bank.

20 **[0188]** In some embodiments, the processor 701 is configured, after performing the data distribution processing on the multiple pieces of transaction data to determine the multiple pieces of normal transaction data, to:

perform data distribution processing on the transaction data to determine abnormal transaction data;

25 label, in a case that the number of occurrences of abnormal transaction data reaches a predetermined number in a predetermined time period, the transaction as a circuit-breaker transaction; and

send a circuit breaker notification, where the circuit breaker notification indicates that a circuit breaker occurs for the transaction.

[0189] In some embodiments, the processor 701 is configured to perform the integration and assembly processing on the multiple pieces of normal transaction data of the transaction, from the time instant at which the transaction request is initiated to the time instant at which the transaction is processed, to obtain the full transaction chain monitoring information by:

5 for each of the multiple pieces of transaction data,

determining whether the piece of transaction data exists in a message queue based on a unique transaction ID, performing analysis processing on the piece of transaction data in a case that the piece of transaction data does not exist in the message queue, and skipping the piece of transaction data in a case that the piece of transaction data exists in the message
10 queue;

in performing analysis processing on the piece of transaction data, labeling the piece of transaction data by:

labeling the piece of transaction data with a first mark in a case that the piece of transaction data is in a first final state, where the first final state is a state in which a receiver
15 returns a processing result of the transaction, and both a transaction starting time instant and a transaction ending time instant exist;

labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in an initial state, where the initial state is a state in which a receiver returns that the transaction is in a processing state, and a transaction starting time instant
20 exists and a transaction ending time instant does not exist; and

labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in a second final state, where the second final state is a state in which a receiver returns a processing result of the transaction, and a transaction ending time instant
exists and a transaction starting time instant does not exist;

25 obtaining transaction data labeled with the second mark, and merging transaction states, transaction starting time instants, transaction ending time instants, codes of a leading bank, codes of a participating bank, types of a customer certificate, the numbers of the customer certificate, application numbers, and credit-using numbers of all transaction data labeled with the second label; and

30 determining, in a case that the merged transaction data is in the first final state, the

merged transaction data as the full transaction chain monitoring information.

[0190] In some embodiments, the processor 701 is further configured, before obtaining the routing rule corresponding to the leading bank, to:

obtain routing switch configuration information of a participating bank;

5 filter out a participating bank with routing switch configuration information indicating that a routing switch is in a closed state;

obtain project configuration information of the leading bank;

obtain an asset access condition based on the project configuration information of the leading bank; and

10 filter out, based on the asset access condition, a participating bank not meeting the asset access condition.

[0191] In some embodiments, the processor 701 is configured to filtering out, based on the routing rule corresponding to the leading bank and the verification index data of the multiple participating banks, the participating bank that is not suitable for the leading bank by:

15 filtering out the participating bank that is not suitable for the leading bank based on a comparison result between the verification index data of the multiple participating banks and the routing rule, where the verification index data of the participating banks includes at least one of: an abnormal circuit breaker, a credit-granting approval time limit, a record indicating whether a customer is rejected in last X days, a credit-granting approval rate in last X months, 20 and a credit-granting rejection rate in the last X months, where X is a positive integer.

[0192] In some embodiments, the processor 701 is further configured, after generating the multiple pieces of index data for the routing rule based on the full transaction chain monitoring information, to:

25 generate index data related to a credit-granting ranking based on the full transaction chain monitoring information, where the index data includes at least one of: a response rate, a loan success rate, a capital cost, and the credit-granting approval time limit; and

after filtering out, based on the routing rule corresponding to the leading bank and the verification index data of the multiple participating banks, the participating bank that is not suitable for the leading bank,

obtain the index data related to the credit-granting ranking;

determine a credit-granting score of each of the participating banks by using the following equation:

a credit-granting score of a participating bank=(a first weight*(1+a*a sequence
5 number of the participating bank ranking in an ascending order based on min(capital cost))+a
second weight*(1+b* a sequence number of the participating bank ranking in an ascending
order based on min(response rate))+a third weight*(1+c*a sequence number of the
participating bank ranking in a descending order based on max(loan success rate))+a fourth
weight*(1+d*a sequence number of the participating bank ranking in an ascending order
10 based on min(credit-granting approval time limit))/4

where a sum of the first weight, the second weight, the third weight and the fourth weight is 1; and

determine a priority of the available participating bank based on the credit-granting score of each of the participating banks.

15 **[0193]** In some embodiments, the processor 701 is configured to send the credit-granting application transaction to the available participating bank by:

in a case that a credit-granting sending mode in product configuration information of the leading bank is a mode of finding multiple joint parties, sending a credit-granting application transaction to each of available participating banks, and receiving a return result from each of
20 the available participating banks; and

in a case that a credit-granting sending mode in product configuration information of the leading bank is a mode of finding a joint party one by one, ranking the available participating banks in an ascending order based on credit-granting scores of the participating banks, and sending credit-granting application transactions to the available participating banks one by
25 one, where if a current participating bank returns a credit-granting failure result, a credit-granting application transaction is sent to a subsequent participating bank, and if a current participating bank returns a credit-granting success result, no credit-granting application transaction is sent to a subsequent participating bank.

[0194] The processor 701 is configured to execute the computer program stored in the
30 memory 703 to:

obtain multiple pieces of transaction data of a transaction;

perform data distribution processing on the multiple pieces of transaction data to determine multiple pieces of normal transaction data;

5 perform integration and assembly processing on multiple pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information;

10 generate multiple pieces of index data related to a credit-using ranking based on the full transaction chain monitoring information, where the multiple pieces of index data related to the credit-using ranking include at least one of: a response rate, a loan success rate, a capital cost, and a credit-using approval time limit;

receive credit-using application information;

obtain a corresponding credit-granting application result based on the credit-using application information;

15 obtain the multiple pieces of index data related to the credit-using ranking;

calculate credit-using scores of participating banks based on the multiple pieces of index data related to the credit-using ranking;

rank the participating banks in an ascending order based on the credit-using scores of the participating banks; and

20 send a credit-using application transaction to each of the participating banks based on the ascending order.

[0195] In some embodiments, the processor 701 is configured to perform the integration and assembly processing on the multiple pieces of normal transaction data of the transaction, from the time instant at which the transaction request is initiated to the time instant at which
25 the transaction is processed, to obtain the full transaction chain monitoring information by:

for each of the multiple pieces of transaction data,

determining whether the piece of transaction data exists in a message queue based on a unique transaction ID, performing analysis processing on the piece of transaction data in a case that the piece of transaction data does not exist in the message queue, and skipping the

piece of transaction data in a case that the piece of transaction data exists in the message queue;

in performing analysis processing on the piece of transaction data, labeling the piece of transaction data by:

5 labeling the piece of transaction data with a first mark in a case that the piece of transaction data is in a first final state, where the first final state is a state in which a receiver returns a processing result of the transaction, and both a transaction starting time instant and a transaction ending time instant exist;

10 labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in an initial state, where the initial state is a state in which a receiver returns that the transaction is in a processing state, and a transaction starting time instant exists and a transaction ending time instant does not exist; and

15 labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in a second final state, where the second final state is a state in which a receiver returns a processing result of the transaction, and a transaction ending time instant exists and a transaction starting time instant does not exist;

20 obtaining transaction data labeled with the second mark, and merging transaction states, transaction starting time instants, transaction ending time instants, codes of a leading bank, codes of a participating bank, types of a customer certificate, the numbers of the customer certificate, application numbers, and credit-using numbers of all transaction data labeled with the second label; and

determining, in a case that the merged transaction data is in the first final state, the merged transaction data as the full transaction chain monitoring information.

25 **[0196]** In some embodiments, the processor 701 is configured to calculating the credit-using scores of the participating banks based on the multiple pieces of index data related to the credit-using ranking by: calculating the credit-using scores of the participating banks based on the multiple pieces of index data related to the credit-using ranking and the following equation:

30 a credit-using score of a participating bank=(a first weight*(1+a*a sequence number of the participating bank ranking in an ascending order based on min(capital cost))+a second

weight*(1+b* a sequence number of the participating bank ranking in an ascending order based on min(response rate))+a third weight*(1+c*a sequence number of the participating bank ranking in an ascending order based on max(loan success rate))+a fourth weight*(1+d*a sequence number of the participating bank ranking in an ascending order based on
5 min(credit-using approval time limit)))/4

where a sum of the first weight, the second weight, the third weight and the fourth weight is 1.

[0197] The processor 701 may be a general processor such as a central processing unit (CPU) and a network processor (NP), a digital signal processing (DSP), an application
10 specific integrated circuit (ASIC), a field-programmable gate array (FPGA) or other programmable logic devices, a discrete gate, a transistor logic device, or a discrete hardware component.

[0198] The memory 703 may include a mass memory for data or instructions. The memory 303 may include but is not limited to: a hard disk drive (HDD), a floppy disk driver, a flash
15 memory, an optical disk, a magneto-optic disk, a tape, a universal serial bus (USB) driver, or a combination of two or more of the above. The memory 803 may include a removable or non-removable (or fixed) medium in appropriate conditions. In an embodiment, the memory 803 is a non-volatile solid-state memory. In an embodiment, the memory 803 includes a read-only memory (ROM). The ROM may be a mask-programmed ROM, a programmable
20 ROM (PROM), an erasable PROM (EPROM), an electrically erasable PROM (EEPROM), an electrically alterable ROM (EAROM), a flash memory, or a combination of two or more of the above.

[0199] The communication bus 704 includes hardware, software, or a combination of the hardware and software, and is configured to couple the above components to each other. For
25 example, the bus may include an accelerated graphics port (AGP) or other graphics buses, an enhanced industry standard architecture (EISA) bus, a front-side bus (FSB), a hyper transport (HT) interconnect bus, an industry standard architecture (ISA) bus, a wireless bandwidth interconnect bus, a low pin count (LPC) bus, a storage bus, a microchannel architecture (MCA) bus, a peripheral component interconnect (PCI) bus, a PCI-Express (PCI-X) bus, a
30 serial advanced technology attachment (SATA) bus, a video electronics standards association local bus (VLB), other appropriate buses, or a combination of two or more of the above. The

number of the bus may be one or more Although specific buses are described and shown in the present disclosure, any appropriate bus or interconnect is applicable in the present disclosure.

[0200] The embodiments of the present disclosure are described above. Other embodiments are within the scope of the claims. In some cases, operations or steps recorded in the claims may be performed in an order different from that in the embodiments and the expected results are achieved. In addition, the processes shown in the drawings are unnecessary to be performed according to a particular order or a consecutive order shown, the expected results are also achieved. In some embodiments, multitasking processing and parallel processing are also possible or may be advantageous.

[0201] Although the operation steps of the method according to the embodiments or flow charts are provided according to the present disclosure, more or fewer operation steps may be included based on conventional or non-creative labor. An order of steps shown in the embodiment is only one of multiple performing orders of steps, and is not the only execution orders. In practices, a device or a client product may sequentially or in parallel (such as a parallel processor or a multithreaded processing environment) perform the method according to the order of steps in the embodiments or shown in the drawing.

[0202] The present disclosure is described with reference to flow charts and/or block diagrams of the method, the device (system), and the computer program product according to the embodiments of the present disclosure. It should be understood that each process and/or block in the flow chart and/or the block diagram, and the combination of the process and/or the block in the flow chart and/or the block diagram can be implemented by computer program instructions. The computer program instructions may be provided to a processor of a general-purpose computer, a special-purpose computer, an embedded processor, or other programmable data processing devices, so as to produce a machine. Thereby, the instructions when executed by the processor of the computer or other programmable data processing devices are configured to generate a device for implementing a function designated by one or more flows in a flow chart and/or one or more blocks in a block diagram.

[0203] The computer program instructions may also be stored in a computer-readable memory which can guide the computer or other programmable data processing devices to operate in a certain manner, such that the instructions stored in the computer-readable

memory generate a product including an instruction device which implements functions specified in one or more flows of the flow charts and/or one or more blocks of the block diagrams.

5 **[0204]** Specific embodiments are used herein to illustrate principles and implementations of the present disclosure, which only intends to help understand a method and a concept of the present disclosure. Variation may be made to a specific implementation and an application scope by those skilled in the art according to the spirit of the present disclosure. Therefore, content in the specification should not be construed as a limit to the present disclosure.

CLAIMS

1. A data processing method for joint loan, comprising:

obtaining a plurality of pieces of transaction data of a transaction;

5 performing data distribution processing on the plurality of pieces of transaction data to determine a plurality of pieces of normal transaction data;

performing integration and assembly processing on a plurality of pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain
10 monitoring information;

generating a plurality of pieces of index data for a routing rule based on the full transaction chain monitoring information;

obtaining a routing rule corresponding to a leading bank;

obtaining, based on the routing rule corresponding to the leading bank, verification index
15 data of a plurality of participating banks corresponding to the routing rule corresponding to the leading bank from the plurality of pieces of index data;

filtering out, based on the routing rule corresponding to the leading bank and the verification index data of the plurality of participating banks, a participating bank that is not suitable for the leading bank to determine an available participating bank; and

20 sending a credit-granting application transaction to the available participating bank.

2. The data processing method according to claim 1, wherein after performing data distribution processing on the plurality of pieces of transaction data to determine the plurality of pieces of normal transaction data, the method further comprises:

25 performing data distribution processing on the transaction data to determine abnormal transaction data;

labeling, in a case that the number of occurrences of abnormal transaction data reaches a predetermined number in a predetermined time period, the transaction as a circuit-breaker transaction; and

sending a circuit breaker notification, wherein the circuit breaker notification indicates that a circuit breaker occurs for the transaction.

3. The data processing method according to claim 1, wherein the performing integration and assembly processing on a plurality of pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information comprises:

for each of the plurality of pieces of transaction data,

determining whether the piece of transaction data exists in a message queue based on a unique transaction ID, performing analysis processing on the piece of transaction data in a case that the piece of transaction data does not exist in the message queue, and skipping the piece of transaction data in a case that the piece of transaction data exists in the message queue;

in performing analysis processing on the piece of transaction data, labeling the piece of transaction data by:

labeling the piece of transaction data with a first mark in a case that the piece of transaction data is in a first final state, wherein the first final state is a state in which a receiver returns a processing result of the transaction, and both a transaction starting time instant and a transaction ending time instant exist;

labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in an initial state, wherein the initial state is a state in which a receiver returns that the transaction is in a processing state, and a transaction starting time instant exists and a transaction ending time instant does not exist; and

labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in a second final state, wherein the second final state is a state in which a receiver returns a processing result of the transaction, and a transaction ending time instant exists and a transaction starting time instant does not exist;

obtaining transaction data labeled with the second mark, and merging transaction states, transaction starting time instants, transaction ending time instants, codes of a leading bank, codes of a participating bank, types of a customer certificate, the numbers of the customer

certificate, application numbers, and credit-using numbers of all transaction data labeled with the second label; and

determining, in a case that the merged transaction data is in the first final state, the merged transaction data as the full transaction chain monitoring information.

5

4. The data processing method according to claim 1, wherein before obtaining the routing rule corresponding to the leading bank, the method further comprises:

obtaining routing switch configuration information of a participating bank;

10 filtering out a participating bank with routing switch configuration information indicating that a routing switch is in a closed state;

obtaining project configuration information of the leading bank;

obtaining an asset access condition based on the project configuration information of the leading bank; and

15 filtering out, based on the asset access condition, a participating bank not meeting the asset access condition.

20 5. The data processing method according to claim 1 or 4, wherein the filtering out, based on the routing rule corresponding to the leading bank and the verification index data of the plurality of participating banks, a participating bank that is not suitable for the leading bank comprises:

filtering out the participating bank that is not suitable for the leading bank based on a comparison result between the verification index data of the plurality of participating banks and the routing rule, wherein

25 the verification index data of the participating banks comprises one or more of: an abnormal circuit breaker, a credit-granting approval time limit, a record indicating whether a customer is rejected in last X days, a credit-granting approval rate in last X months, and a credit-granting rejection rate in the last X months, where X is a positive integer.

6. The data processing method according to claim 5, wherein

after generating the plurality of pieces of index data for the routing rule based on the full transaction chain monitoring information, the method further comprises:

generating index data related to a credit-granting ranking based on the full transaction chain monitoring information, wherein the index data comprises one or more of: a response rate, a loan success rate, a capital cost, and the credit-granting approval time limit; and

after filtering out, based on the routing rule corresponding to the leading bank and the verification index data of the plurality of participating banks, the participating bank that is not suitable for the leading bank, the method further comprises:

obtaining the index data related to the credit-granting ranking;

determining a credit-granting score of each of the participating banks based on one or more of the response rate, the loan success rate, the capital cost, and the credit-granting approval time limit; and

determining a priority of the available participating bank based on the credit-granting score of each of the participating banks.

7. The data processing method according to claim 5, wherein the sending a credit-granting application transaction to the available participating bank comprises:

in a case that a credit-granting sending mode in product configuration information of the leading bank is a mode of finding a plurality of joint parties, sending a credit-granting application transaction to each of available participating banks, and receiving a return result from each of the available participating banks; and

in a case that a credit-granting sending mode in product configuration information of the leading bank is a mode of finding a joint party one by one, ranking the available participating banks in an ascending order based on credit-granting scores of the participating banks, and sending credit-granting application transactions to the available participating banks one by one, wherein if a current participating bank returns a credit-granting failure result, a credit-granting application transaction is sent to a subsequent participating bank, and if a

current participating bank returns a credit-granting success result, no credit-granting application transaction is sent to a subsequent participating bank.

8. A data processing method for joint loan, comprising:

5 obtaining a plurality of pieces of transaction data of a transaction;

performing data distribution processing on the plurality of pieces of transaction data to determine a plurality of pieces of normal transaction data;

10 performing integration and assembly processing on a plurality of pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information;

generating a plurality of pieces of index data related to a credit-using ranking based on the full transaction chain monitoring information, wherein the plurality of pieces of index data related to the credit-using ranking comprise one or more of: a response rate, a loan success rate, a capital cost, and a credit-using approval time limit;

15 receiving credit-using application information;

obtaining a corresponding credit-granting application result based on the credit-using application information;

obtaining the plurality of pieces of index data related to the credit-using ranking;

20 calculating credit-using scores of participating banks based on the plurality of pieces of index data related to the credit-using ranking;

ranking the participating banks in an ascending order based on the credit-using scores of the participating banks; and

25 sending a credit-using application transaction to each of the participating banks based on the ascending order.

9. The data processing method according to claim 8, wherein the performing integration and assembly processing on a plurality of pieces of normal transaction data of the transaction,

from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information comprises:

for each of the plurality of pieces of transaction data,

5 determining whether the piece of transaction data exists in a message queue based on a unique transaction ID, performing analysis processing on the piece of transaction data in a case that the piece of transaction data does not exist in the message queue, and skipping the piece of transaction data in a case that the piece of transaction data exists in the message queue;

10 in performing analysis processing on the piece of transaction data, labeling the piece of transaction data by:

labeling the piece of transaction data with a first mark in a case that the piece of transaction data is in a first final state, wherein the first final state is a state in which a receiver returns a processing result of the transaction, and both a transaction starting time instant and a transaction ending time instant exist;

15 labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in an initial state, wherein the initial state is a state in which a receiver returns that the transaction is in a processing state, and a transaction starting time instant exists and a transaction ending time instant does not exist; and

20 labeling the piece of transaction data with a second mark in a case that the piece of transaction data is in a second final state, wherein the second final state is a state in which a receiver returns a processing result of the transaction, and a transaction ending time instant exists and a transaction starting time instant does not exist;

25 obtaining transaction data labeled with the second mark, and merging transaction states, transaction starting time instants, transaction ending time instants, codes of a leading bank, codes of a participating bank, types of a customer certificate, the numbers of the customer certificate, application numbers, and credit-using numbers of all transaction data labeled with the second label; and

determining, in a case that the merged transaction data is in the first final state, the merged transaction data as the full transaction chain monitoring information.

10. The data processing method according to claim 8, wherein the calculating credit-using scores of participating banks based on the plurality of pieces of index data related to the credit-using ranking comprises:

calculating the credit-using scores of the participating banks based on the plurality of
5 pieces of index data related to the credit-using ranking and a predetermined weight.

11. A computer-readable storage medium storing a computer program, wherein the computer program, when executed by a processor, causes the processor to perform the data processing method for joint loan according to any one of claims 1 to 10.

10

12. A computer device, comprising:

one or more processors; and

a memory, storing one or more programs, wherein

the one or more programs, when executed by one or more processors, cause the one or
15 more processors to perform the data processing method for joint loan according to any one of claims 1 to 10.

13. A data processing system for joint loan, comprising:

a first server, configured to: obtain a plurality of pieces of transaction data of a
20 transaction; perform data distribution processing on the plurality of pieces of transaction data to determine a plurality of pieces of normal transaction data; perform integration and assembly processing on a plurality of pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information; and generate
25 a plurality of pieces of index data associated with a routing rule based on the full transaction chain monitoring information; and

a second server, configured to: obtain a routing rule corresponding to a leading bank; obtain, based on the routing rule corresponding to the leading bank, verification index data of a plurality of participating banks corresponding to the routing rule corresponding to the

leading bank from the plurality of pieces of index data; filter out, based on the routing rule corresponding to the leading bank and the verification index data of the plurality of participating banks, a participating bank that is not suitable for the leading bank to determine an available participating bank; and send a credit-granting application transaction to the
5 available participating bank.

14. A data processing system for joint loan, comprising:

a first server, configured to: obtain a plurality of pieces of transaction data of a transaction; perform data distribution processing on the plurality of pieces of transaction data
10 to determine a plurality of pieces of normal transaction data; perform integration and assembly processing on a plurality of pieces of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information; generate a plurality of pieces of index data related to a credit-using ranking based on the full transaction
15 chain monitoring information, wherein the plurality of pieces of index data related to the credit-using ranking comprise one or more of: a response rate, a loan success rate, a capital cost, and a credit-using approval time limit; and

a second server, configured to: receive credit-using application information; obtain a corresponding credit-granting application result based on the credit-using application
20 information; obtain the plurality of pieces of index data related to the credit-using ranking; calculate credit-using scores of participating banks based on the plurality of pieces of index data related to the credit-using ranking; rank the participating banks in an ascending order based on the credit-using scores of the participating banks; and send a credit-using application transaction to each of the participating banks based on the ascending order.

25
15. A data processing system for joint loan, comprising:

a first server, configured to:

obtain a plurality of pieces of transaction data of a transaction; perform data distribution processing on the plurality of pieces of transaction data to determine a plurality of pieces of
30 normal transaction data; perform integration and assembly processing on a plurality of pieces

of normal transaction data of the transaction, from a time instant at which a transaction request is initiated to a time instant at which the transaction is processed, to obtain full transaction chain monitoring information; generate a plurality of pieces of index data based on the full transaction chain monitoring information, wherein the plurality of pieces of index data comprise verification index data of a plurality of participating banks and a plurality of pieces of index data related to a credit-using ranking; and

a second server, configured to:

receive credit-granting application information, and obtain a routing rule corresponding to a leading bank based on the credit-granting application information; obtain, based on the routing rule, verification index data of a plurality of participating banks corresponding to the routing rule from the plurality of pieces of index data; filter out, based on the routing rule and the verification index data of the plurality of participating banks, a participating bank that is not suitable for the leading bank to determine an available participating bank; send a credit-granting application transaction to the available participating bank; and

receive credit-using application information; obtain a corresponding credit-granting application result based on the credit-using application information; obtain the plurality of pieces of index data related to the credit-using ranking; calculate credit-using scores of participating banks based on the plurality of pieces of index data related to the credit-using ranking; rank the participating banks in an ascending order based on the credit-using scores of the participating banks; and send a credit-using application transaction to each of the participating banks based on the ascending order.