

TRADING BROKERAGE METHOD AND TRADING BROKERAGE PROGRAM

FIELD

The embodiments discussed herein relate to a
5 trading brokerage method and a trading brokerage program.

BACKGROUND

Trading for securities including stocks, bonds,
and others has increasingly been conducted electronically,
10 and a variety of services for such electronic trading are
offered. For example, trading brokerage services are
available which provide enquiry and negotiation functions
for securities trading between investors and market makers
using request for quote (RFQ).

15 In addition, the following order forwarding system
has been proposed. This order forwarding system is
connected to a plurality of electronic trading systems such
as proprietary trading systems (PTSS), and is designed to
identify an electronic trading system that is able to execute
20 an order under the most preferable conditions from among the
electronic trading systems on the basis of real-time price
information provided by the electronic trading systems and
then forward the order to the identified electronic trading
system.

25 See, for example, Japanese Laid-open Patent
Publication No. 2008-59292.

Some of the above-mentioned trading brokerage

services impose constraints that, when a quoted price provided by a market maker is presented to an investor side and an execution request for a trade at the quoted price is received from the investor side, the trade will only be
5 executed if the quoted price matches the latest quoted price provided at that point in time. Here, the quoted price may be updated frequently (e.g., every second), while there may be some time lag between the presentation of the quoted price to the investor side and the receipt of the execution
10 request for the trade from the investor side. Therefore, under the constraints, trade failures are likely to occur frequently because quoted prices are changed by the time when execution requests for the trades are received.

15 SUMMARY

In one aspect, an object of the present disclosure is to provide a trading brokerage method and a trading brokerage program that are able to reduce the likelihood that trades for securities fail to execute due to quoted
20 price changes.

According to one aspect, there is provided a trading brokerage method executed by a computer. The trading brokerage method includes: presenting a first quoted price to a trading system on an investor side, the first
25 quoted price being best among quoted prices provided by a plurality of market makers; determining, upon receiving an execution request for a trade at the first quoted price from

the trading system, whether a second quoted price currently provided by a first market maker that is a provider of the first quoted price matches the first quoted price; performing, upon determining that the second quoted price matches the first quoted price, a process to execute the trade at the first quoted price; extracting, upon determining that the second quoted price does not match the first quoted price, a third quoted price that is best from quoted prices currently provided by the plurality of market makers; performing, upon determining that the third quoted price matches the first quoted price, a process to execute the trade at the third quoted price; and notifying, upon determining that the third quoted price does not match the first quoted price, the trading system that the trade has failed to execute.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 illustrates an example of the configuration and processing of a trading brokerage apparatus according to a first embodiment;

FIG. 2 illustrates an example of the overall configuration of a securities trading system according to a second embodiment;

FIG. 3 illustrates an example of the hardware configuration of a brokerage server;

FIG. 4 illustrates an example of the configuration of processing functions provided in a brokerage system;

FIG. 5 is an example of a flowchart illustrating a processing procedure of a quote processing unit;

FIGS. 6A to 6C illustrate examples of quote changes;

5 FIG. 7 illustrates an example of processing performed by a trade request processing unit;

FIG. 8 is a flowchart illustrating an example of the processing performed by the trade request processing unit;

10 FIG. 9 illustrates a first example of the processing performed by the trade request processing unit using a status;

FIG. 10 illustrates a second example of the processing performed by the trade request processing unit
15 using the status;

FIG. 11 illustrates a third example of the processing performed by the trade request processing unit using the status;

FIG. 12 illustrates a fourth example of the processing performed by the trade request processing unit
20 using the status;

FIG. 13 is a first sequence diagram illustrating a first example of a trade execution process;

FIG. 14 is a second sequence diagram illustrating
25 the first example of the trade execution process; and

FIG. 15 is a sequence diagram illustrating a second example of the trade execution process.

DESCRIPTION OF EMBODIMENTS

Hereinafter, embodiments will be described with reference to the accompanying drawings.

5 First Embodiment

FIG. 1 illustrates an example of the configuration and processing of a trading brokerage apparatus according to a first embodiment. The trading brokerage apparatus 1 illustrated in FIG. 1 mediates securities trading between
10 an investor 2 and a market maker. For example, the trading brokerage apparatus 1 makes enquiries and negotiations on the securities trading between the investor 2 and a plurality of market makers.

This first embodiment provides an example in which
15 the trading brokerage apparatus 1 mediates securities trading between the investor 2 and market makers 4a (MM#A), 4b (MM#B), and 4c (MM#C). In addition, the trading brokerage apparatus 1 and the investor 2 communicate with each other via a trading system 3.

20 The trading brokerage apparatus 1 is a computer (for example, a server computer) having one or a plurality of processors. For example, the processing of the trading brokerage apparatus 1, which will be described below, is implemented by the processor(s) provided in the trading
25 brokerage apparatus 1 executing predetermined programs. In this connection, the processing, as described below, of the trading brokerage apparatus 1 may be performed in a

distributed manner by a plurality of trading brokerage apparatuses.

The following describes, as an example, the case where the investor 2 requests a buy trade for a security of a specific issue.

At a certain time, the trading brokerage apparatus 1 receives quoted prices provided by the market makers 4a to 4c for the security of the specific issue. Each of the quoted prices is a desired bid or ask price provided for the security of the issue. The quoted prices here are quoted ask prices. The trading brokerage apparatus 1 extracts the best quoted price from the provided quoted prices, and sends the extracted quoted price to the trading system 3 to present the quoted price to the investor 2 (step S1). The example of FIG. 1 assumes that the market makers 4a, 4b, and 4c provide the quoted prices of 1,003 yen, 1,004 yen, and 1,005 yen, respectively. In this case, the quoted price of 1,003 yen provided by the market maker 4a (MM#A) is extracted as the best quoted price (in this example, the lowest quoted price) and is presented to the investor 2.

Assume now that the investor 2 requests a buy trade at the presented quoted price of 1,003 yen. In this case, an execution request for the trade is sent from the trading system 3 according to operations of the investor 2, and is then received by the trading brokerage apparatus 1 (step S2).

By the way, there is a time lag between when the trading brokerage apparatus 1 extracts the best quoted price

and sends it to the trading system 3 at step S1 and when the trading brokerage apparatus 1 receives the execution request for the trade at that quoted price at step S2. In addition, the market makers 4a to 4c frequently provide the trading
5 brokerage apparatus 1 with the quoted prices for the security of the above issue. Therefore, there is a possibility that the quoted price provided by the market maker 4a is updated between step S1 and step S2.

Assume now that the trading brokerage apparatus 1
10 imposes the following constraints on the trading brokerage process: when the trading brokerage apparatus 1 presents a quoted price provided by a market maker to an investor side and then receives an execution request for a trade at the quoted price from the investor side, the trading brokerage
15 apparatus 1 will only execute the trade if the quoted price matches the latest quoted price provided at that point in time. That is, the constraints are such that, when receiving the execution request for the trade at step S2, the trading brokerage apparatus 1 is able to perform a process to execute
20 the trade at the quoted price in the case where the quoted price provided by the market maker 4a at that point in time is 1,003 yen. More specifically, in this case, the trading brokerage apparatus 1 is able to perform a process for the investor 2 to buy the security of the above issue at 1,003
25 yen from the market maker 4a.

In the case where the quoted price provided by the market maker 4a at the point in time when the trading

brokerage apparatus 1 receives the execution request for the trade at step S2 is not 1,003 yen, on the other hand, the trade between the investor 2 and the market maker 4a fails to execute. For example, the trade between the investor 2
5 and the market maker 4a fails to execute, regardless of whether the quoted price provided by the market maker 4a at the point in time when the trading brokerage apparatus 1 receives the execution request for the trade at step S2 is higher than or lower than 1,003 yen.

10 As described above, the quoted price is frequently updated by the market maker 4a. Therefore, it is highly likely that the quoted price provided by the market maker 4a at the time of the execution request for the trade being received at step S2 is no longer 1,003 yen. If the trading
15 brokerage apparatus 1 does not execute a trade, without any exception, when the quoted price provided by the market maker 4a at the time of receipt of an execution request for the trade does not match the original quoted price, trade failures are likely to occur frequently.

20 To address this problem, the trading brokerage apparatus 1 of the first embodiment performs the following processing in the case where the quoted price provided by the market maker 4a at the time of receipt of the execution request for the trade does not match the original quoted
25 price. The trading brokerage apparatus 1 extracts the best quoted price from the quoted prices provided currently (i.e., at the time corresponding to step S2) by the market makers

4a to 4c. The trading brokerage apparatus 1 then determines whether the extracted quoted price matches the original quoted price (the quoted price presented at step S1 and requested for the execution of the trade). In the case
5 where these quoted prices do not match, the trading brokerage apparatus 1 causes the trade to fail, and then notifies the investor 2 via the trading system 3 that the trade has failed to execute. In the case where these quoted prices match, on the other hand, the trading brokerage apparatus 1 performs
10 a process to execute the trade at the extracted quoted price.

The example of FIG. 1 assumes that the quoted prices of 1,004 yen, 1,005 yen, and 1,003 yen are already provided by the market makers 4a, 4b, and 4c, respectively, at the time of the execution request for the trade being
15 received at step S2. In this case, the trading brokerage apparatus 1 determines whether the quoted price provided by the market maker 4a (1,004 yen) matches the quoted price presented at step S1 (1,003 yen) (step S3).

In the example of FIG. 1, these quoted prices do
20 not match. Therefore, the trading brokerage apparatus 1 then extracts the best quoted price from the quoted prices provided by the market makers 4a to 4c at the time of step S2 (step S4). In this example, the quoted price of 1,003 yen provided by the market maker 4c (MM#C) is extracted as
25 the best quoted price. The trading brokerage apparatus 1 determines whether the extracted quoted price (1,003 yen) matches the quoted price (1,003 yen) presented at step S1

(step S5). In the example of FIG. 1, these quoted prices match. Therefore, the trading brokerage apparatus 1 then performs a process to execute the trade at the extracted quoted price (1,003 yen) (step S6). Specifically, this
5 process is to execute the trade at the above quoted price of 1,003 yen between the investor 2 and the market maker 4c.

As described above, when receiving an execution request for a trade from the investor 2 side, the trading brokerage apparatus 1 of the first embodiment does not always
10 cause the trade to fail even if the quoted price provided by the counterparty market maker of the trade at that point in time differs from the original quoted price. In the case where the best quoted price among the quoted prices provided by the plurality of market makers at that point in time
15 matches the original quoted price, the trading brokerage apparatus 1 performs a process to execute the trade at the quoted price. This approach makes it possible to reduce the likelihood of trade failures for securities due to quoted price changes.

20 In this connection, in the case where an execution request for a trade is received at step S2 and then it is determined at step S3 that the quoted prices match, for example, the process to execute the trade at the quoted price involves first requesting an approval for the trade
25 from the counterparty market maker (in the example of FIG. 1, the market maker 4a). Therefore, strictly speaking, the latest quoted prices from the market makers 4a to 4c, which

are referenced at steps S3 and S4, may be quoted prices just before the approval request is made, not at the time of the execution request being received at step S2.

The above example relates to the case where the investor 2 requests a buy trade for a security. As another example, in the case where the investor 2 requests a sell trade for a security, the market makers 4a to 4c provide the trading brokerage apparatus 1 with quoted bid prices. Then, at steps S1 and S4, the highest quoted price is extracted as the best quoted price from the quoted prices provided by the market makers 4a to 4c.

Second Embodiment

FIG. 2 illustrates an example of the overall configuration of a securities trading system according to a second embodiment. The securities trading system illustrated in FIG. 2 includes a brokerage system 100, an investor system 210, a trading agent system 220, a market maker (MM) system 230, securities company systems 240 and 250, and a securities exchange system 260.

The brokerage system 100 is a server system that is operated by a brokerage entity providing a brokerage service 10 for securities trading. The brokerage service 10 is designed to mediate enquiries and negotiations for securities trading between an investor 21 and a market maker 23 using request for quote (RFQ), and may be referred to as an "RFQ platform". The brokerage service 10 receives an RFQ specifying an issue and quantity (the number of units or the

amount) of a security desired to be traded from the investor 21. The brokerage service 10 presents the best price among the prices provided by market makers 23 to the investor 21 side, so as to allow the investor 21 to trade the desired
5 security.

In this connection, one example of securities (financial products) to be traded is exchange traded funds (ETFs). In this case, the investor 21 that becomes a user of the brokerage service 10 is an institutional investor
10 such as a financial institution or an insurance company.

The investor system 210 is a computer system of the investor 21 using the brokerage service 10. For example, the investor system 210 includes a terminal device that is operated by an operator, for example. In the case where the
15 investor 21 is an institutional investor (cooperation or organization), the investor system 210 may include a server computer.

The trading agent system 220 is a server system that is operated by a trading agent providing a trading
20 service 22 for securities. The trading agent system 220 is an example of the trading system 3 of FIG. 1. For example, the trading service 22 displays a graphical user interface (GUI) screen on the terminal device of the investor system 210, and performs processing relating to securities trading
25 in accordance with operations made on the GUI screen by the operator on the investor 21 side. In the second embodiment, the trading agent system 220 is designed to display a GUI

screen for creating an RFQ on the terminal device of the investor system 210, create the RFQ on the basis of information entered on the GUI screen, and send the RFQ to the brokerage system 100.

5 In this connection, the investor 21 is able to use the brokerage service 10 directly, without using the trading service 22.

 The market maker system 230 is a server system that is operated by a market maker 23. The market maker 23
10 is a financial company that provides quoted bid and ask prices (quotes) for market making. There are a plurality of market makers 23, and the market maker system 230 of each market maker 23 is connected to the brokerage system 100.

 The securities company system 240 is a server
15 system that is operated by a securities company 24 that the investor 21 uses (more specifically, the securities company 24 with which the investor 21 has a securities account). The securities company system 240 is able to receive a trade request from the investor 21 via the brokerage system 100
20 and execute the trade.

 The securities company system 250 is a server system that is operated by a securities company 25 that a market maker 23 uses (more specifically, the securities company 25 with which the market maker 23 has a securities
25 account). The securities company system 250 is able to receive a request for a trade upon which the market maker 23 has agreed with the investor 21, via the brokerage system

100 and execute the trade.

In this connection, the plurality of market makers 23 exist as mentioned above, and there are securities company systems 250 respectively for securities companies 25 that 5 the market makers 23 use. Since some market makers 23 may use the same securities company 25, one or more securities company systems 250 may actually be connected to the brokerage system 100.

The securities exchange system 260 is a server 10 system that is operated by a securities exchange 26 that executes securities trading on the basis of orders received from the securities companies 24 and 25. For example, the securities exchange system 260 provides an electronic trading service for off-auction trading.

15 In the following description, the term "quote" is used to refer to a quoted price (bid or ask price) provided by a market maker 23. A quote is included in quote information that is individually sent from the market maker systems 230 used by the market makers 23.

20 The following describes an example of a computer included in the securities trading system.

FIG. 3 illustrates an example of the hardware configuration of a brokerage server. The brokerage server 110 is an example of a server computer included in the 25 brokerage system 100. In addition, the brokerage server 110 is an example of the trading brokerage apparatus 1 of FIG.

As illustrated in FIG. 3, the brokerage server 110 includes a processor 111, a random access memory (RAM) 112, a hard disk drive (HDD) 113, a graphics processing unit (GPU) 114, an input interface (I/F) 115, a reader device 5 116, and a communication interface (I/F) 117.

The processor 111 centrally controls the entire brokerage server 110. For example, the processor 111 is a central processing unit (CPU), a micro processing unit (MPU), a digital signal processor (DSP), an application specific 10 integrated circuit (ASIC), or a programmable logic device (PLD). The processor 111 may be a combination of two or more units selected from the CPU, MPU, DSP, ASIC, and PLD.

In this connection, the brokerage server 110 may be provided with a plurality of processors 111. Different 15 processors may perform different ones of a plurality of processes performed by the brokerage server 110. The processor 111 may be referred to as processor circuitry.

The RAM 112 is used as a main memory of the brokerage server 110. The RAM 112 temporarily stores at 20 least part of operating system (OS) programs and application programs being executed by the processor 111. In addition, the RAM 112 stores various kinds of data being used by the processor 111 in processing.

The HDD 113 is used as a secondary storage device 25 of the brokerage server 110. The HDD 113 stores OS programs, application programs, and various kinds of data. In this connection, as the secondary storage device, another type

of non-volatile storage device such as a solid-state drive (SSD) may be used.

A display device 121 is connected to the GPU 114. The GPU 114 displays images on the display device 121 in
5 accordance with commands from the processor 111. As the display device 121, a liquid crystal display or an organic electro-luminescence (EL) display may be used.

An input device 122 is connected to the input interface 115. The input interface 115 sends signals
10 received from the input device 122 to the processor 111. The input device 122 may be a keyboard, a pointing device, or another. Pointing devices include a mouse, a touch panel, a tablet, a touch pad, a track ball, and others.

A portable storage medium 123 is attached to and
15 detached from the reader device 116. The reader device 116 reads data from the portable storage medium 123 and sends the data to the processor 111. The portable storage medium 123 may be an optical disc, a semiconductor memory, or another.

20 The communication interface 117 communicates data with other apparatuses over a network 124.

The brokerage server 110 with the above-described hardware configuration is able to implement its processing functions. In this connection, the brokerage system 100 may
25 include a plurality of computers with the configuration illustrated in FIG. 3. Moreover, each of the investor system 210, trading agent system 220, market maker systems 230,

securities company systems 240 and 250, and securities exchange system 260 may also include one or more computers with the configuration illustrated in FIG. 3.

FIG. 4 illustrates an example of the configuration of processing functions provided in the brokerage system. The brokerage system 100 includes a storage unit 130, a quote processing unit 141, and a trade request processing unit 142.

The storage unit 130 is a storage space kept in a storage device included in the brokerage system 100. The storage unit 130 stores a requester information database (DB) 131, a request destination information database (DB) 132, and a quote database (DB) 133.

The requester information database 131 contains information on the investor 21 that uses the brokerage service 10 and information on the trading service 22 and securities company 24 that the investor 21 uses. The request destination information database 132 contains information on the market makers 23 that are the destinations of quoted price requests and information on the securities companies 25 that the market makers 23 use.

The quote database 133 accumulates quote information individually provided by the market makers 23. For example, the quote information includes a quote ID identifying the quote information, information specifying an issue, an order type specifying "sell" or "buy", information specifying a market maker that is the provider

of the quote information, a provision time indicating the time of the quote information provided, a provided price (quote), and others. Such quote information, with a status added thereto, is registered in the quote database 133. The
5 status added here indicates whether the quote information has been updated.

The processing of the quote processing unit 141 and trade request processing unit 142 is implemented by, for example, the processor 111 of the brokerage server 110
10 included in the brokerage system 100 performing predetermined processes. The processing of the quote processing unit 141 and the processing of the trade request processing unit 142 may be performed by different brokerage servers 110 included in the brokerage system 100.

15 When the quote processing unit 141 receives an RFQ for a security of a certain issue from the investor 21 side, the quote processing unit 141 forwards the RFQ to the plurality of market makers 23 to request a quote. The quote processing unit 141 receives quote information that is
20 frequently provided by the plurality of market makers 23 in response to the RFQ, and stores the quote information in the quote database 133. The quote processing unit 141 extracts the best quote from the provided quotes with reference to the quote database 133, and presents the extracted best
25 quote to the investor 21 side.

When receiving an execution request for a trade at the presented best quote from the investor 21 side, the

trade request processing unit 142 sends order requests to the securities company system 240 corresponding to the investor 21 and the securities company system 250 corresponding to the market maker 23. By doing so, the
5 trade request processing unit 142 causes that trade to be executed.

FIG. 5 is an example of a flowchart illustrating the processing procedure of the quote processing unit.

(Step S11) The investor system 210 sends an RFQ
10 requesting a trade via the trading agent system 220, and the quote processing unit 141 receives this RFQ. The RFQ includes information specifying an issue to be traded, an order type indicating "sell" or "buy", and others. The quote processing unit 141 sends the received RFQ to the
15 market maker systems 230 of the plurality of market makers 23.

(Step S12) The quote processing unit 141 monitors quote information that is individually sent from the market maker systems 230 of the market makers 23 in response to the
20 sent RFQ. The quote processing unit 141 repeats step S12 while it does not receive quote information, and when the quote processing unit 141 receives quote information, the processing proceeds to step S13.

(Step S13) The quote processing unit 141 registers
25 the received quote information with a status added, in the quote database 133. The status is set to "Open" indicating that the quote information is not yet updated.

(Step S14) The quote processing unit 141 detects the immediately previous quote information sent by the same market maker 23 in response to the same RFQ and then registered, with reference to the quote database 133. The
5 quote processing unit 141 updates the status added to the detected quote information to "Overwritten" indicating that the quote information has been updated.

(Step S15) The quote processing unit 141 collects, from the quote database 133, quote information that
10 corresponds to the same RFQ and has a status of "Open". The quote processing unit 141 extracts the quote information (best quote information) that includes the best quote from the collected quote information, and sends the extracted quote information to the sender of the RFQ. As a result,
15 the best quote is presented to the investor 21. In the case where the RFQ indicates an order type of "buy", the best quote is the lowest price among the collected quotes. In the case where the RFQ indicates an order type of "sell", on the other hand, the best quote is the highest price among
20 the collected quotes.

After that, the processing proceeds to step S12. In this connection, the processing of FIG. 5 is completed when, for example, a trade execution request is received in response to the best quote presented at step S15.

25 Through the above processing, the quote information frequently provided by the market makers 23 is accumulated in the quote database 133. Among the quote

information provided by the same market maker 23 in response to the same RFQ and accumulated in the quote database 133, the latest quote information has a status of "Open", and the quote information provided before the latest one has a status
5 of "Overwritten". For example, in response to an RFQ, quote information is sent approximately every second from each of the plurality of market makers 23.

In the above processing, each time a new quote is provided by any of the market makers 23 in response to the
10 sent RFQ, the best quote at that point in time is extracted and presented to the investor 21. The investor 21 is able to request the execution of a trade at the best quote presented at any desired timing. In accordance with operations by the investor 21 to request the execution of
15 the trade, a trade execution request is sent from the investor system 210 via the trading agent system 220 to the brokerage system 100. The trade execution request specifies the quote ID of the best quote information sent at step S15.

By the way, the above-described brokerage service
20 10, which is carried out in response to receipt of an RFQ or trade execution request from the investor 21 via the trading agent system 220, has constraints that the quote price targeted by a trade execution request needs to match a quote price at which the trade is actually executed. That
25 is, the constraints are such that the following two prices need to match: one is the price indicated by a quote presented at step S15, which is targeted by a received trade

execution request, and the other is the price indicated by the latest quote provided by the market maker 23, which is the provider of the presented quote, at the time of receipt of the trade execution request.

5 Note, however, that there is some time lag between when the best quote is extracted at step S15 and when the best quote is presented to the investor 21 side and a trade execution request is sent in accordance with operations of the investor 21 and is then received by the brokerage system
10 100. In addition, the market makers 23 frequently provide quotes in response to the same RFQ, as described above. Therefore, it is highly likely that the quote provided by the same market maker 23 is updated during the time interval between the best quote being presented and the trade
15 execution request being received.

The following assumes, as an example, that a buy trade for a security of a certain issue is requested by the investor 21 side.

FIGS. 6A to 6C illustrate examples of quote
20 changes. FIGS. 6A to 6C assume that three market makers MM1 to MM3 provide quotes for the same issue. FIGS. 6A to 6C provide three patterns P1 to P3, respectively, in which the best quote at the same time is underlined.

The examples of FIGS. 6A to 6C assume, as seen in
25 the patterns P1 to P3, that the quotes of 1,003 yen, 1,004 yen, and 1,005 yen are already provided by the market makers MM1, MM2, and MM3, respectively, at 10:10:10. In this case,

the best quote is 1,003 yen from the market maker MM1. Therefore, the brokerage system 100 presents the quote information including the quote (1,003 yen) provided by the market maker MM1, to the investor 21 side.

5 Furthermore, it is also assumed, as seen in the patterns P1 to P3, that the brokerage system 100 receives a trade execution request for a trade based on the quote information at 10:10:11. The pattern P1 indicates that the quote provided by the market maker MM1 is not yet updated
10 but remains unchanged at 1,003 yen at the time of the receipt of the trade execution request. In this case, the trade is executed at 1,003 yen between the investor 21 and the market maker MM1.

 The pattern P2 indicates that the quote provided
15 by the market maker MM1 is already updated to 1,002 yen at the time of the receipt of the trade execution request. In this case, the trade between the investor 21 and the market maker MM1 fails to execute. The pattern P3 indicates that the quote provided by the market maker MM1 is already updated
20 to 1,004 yen at the time of the receipt of the trade execution request. In this case, the trade between the investor 21 and the market maker MM1 fails to execute as well. Regardless of whether the quote from the market maker MM1 has risen or fallen at the time of the receipt of the
25 trade execution request, as indicated in the patterns P2 and P3, the trade with the market maker MM1 fails to execute.

 As seen from the above, it is highly likely that

the quote provided by the same market maker 23 is updated during the time interval between a best quote (original quote) being presented and a trade execution request being received. Therefore, if the brokerage system 100 causes a
5 trade to fail, without any exception, when the quote (latest quote) provided at the time of the receipt of a trade execution request for the trade does not match the original quote, trade failures are likely to occur frequently.

To address this problem, in the case where the
10 original quote and the latest quote do not match, the trade request processing unit 142 extracts the best quote from the quotes provided for the same RFQ by the market makers 23 at that point in time. Then, in the case where the price indicated by the extracted best quote matches the price
15 indicated by the original quote, the trade request processing unit 142 performs a process to execute the trade based on the quote information including the extracted best quote. This approach makes it possible to reduce the likelihood of trade failures and thus to increase
20 convenience for the investor 21 side.

FIG. 7 illustrates an example of processing performed by the trade request processing unit. FIG. 7 exemplifies how the trade request processing unit 142 operates in the case of the pattern P3 of FIG. 6C.

25 In response to the trade execution request received at 10:10:11, the trade request processing unit 142 determines whether the quote (1,004 yen) provided by the

market maker MM1 at that point in time matches the original quote (1,003 yen). In this example, these quotes do not match. Therefore, the trade at the original quote fails to execute.

5 In this case, the trade request processing unit 142 then extracts the best quote from the quotes provided by the market makers MM1 to MM3 at this point in time. Referring to the example of FIG. 7, the quote (1,003 yen) from the market maker MM2 is extracted as the best quote.

10 The trade request processing unit 142 then determines whether the extracted best quote (1,003 yen) matches the original quote (1,003 yen). In this example, these quotes match. Therefore, the trade request processing unit 142 performs a process to execute the trade at the quoted price

15 of 1,003 yen between the investor 21 and the market maker MM2. By doing so, the trade request processing unit 142 makes it possible to execute the trade at the same price as the original quote between the investor 21 and the market maker MM2.

20 FIG. 8 is a flowchart illustrating an example of the processing performed by the trade request processing unit.

(Step S21) The trade request processing unit 142 receives a trade execution request requesting the execution

25 of a trade at a presented quote. The trade execution request specifies the quote ID of the quote information including the presented quote.

(Step S22) The trade request processing unit 142 obtains the quote ID from the trade execution request and identifies the quote information with the obtained quote ID from the quote database 133. The trade request processing
5 unit 142 obtains the status added to the identified quote information.

(Step S23) The trade request processing unit 142 confirms whether the status indicates "Open". If the status indicates "Open", the processing proceeds to step S24. If
10 the status indicates "Overwritten", on the other hand, the processing proceeds to step S25. In this connection, in the case where the quote information including the original quote identified at step S22 has a status of "Open", it is determined at this step S23 that the original quote is equal
15 to the latest quote currently provided by the same market maker 23.

(Step S24) The trade request processing unit 142 continues the processing on the basis of the above quote information. More specifically, the processing continues
20 to execute the trade based on the quote information between the investor 21 and the market maker 23 that is the provider of the quote information.

(Step S25) The trade request processing unit 142 obtains quote information with a status of "Open" from the
25 quote information provided for the same RFQ by the market makers 23.

(Step S26) The trade request processing unit 142

extracts the best quote information including the best quote from the quote information obtained at step S25.

(Step S27) The trade request processing unit 142 determines whether the quote included in the extracted best
5 quote information is equal to the original quote. If these quotes are equal, the processing proceeds to step S28. If these quotes are not equal, then the processing proceeds to step S29.

(Step S28) The trade request processing unit 142
10 continues the processing on the basis of the extracted best quote information. More specifically, the processing continues to execute the trade based on the best quote information between the investor 21 and the market maker 23 that is the provider of the best quote information.

(Step S29) The trade is caused to fail. The trade
15 request processing unit 142 sends the trading agent system 220 notification information indicating that the trade has failed to execute. This notification information is sent to the investor system 210. By doing so, the investor 21 is
20 notified that the trade has failed to execute.

The following describes examples of the processing performed by the trade request processing unit 142 using the status, with reference to FIGS. 9 to 12. As in FIGS. 6A to 6C and 7, FIGS. 9 to 12 assume that an RFQ requesting a buy
25 trade for a certain issue is sent from the investor 21 side, and quotes are provided by the three market makers MM1 to MM3 in response to the RFQ.

In addition, FIGS. 9 to 12 illustrate quote databases 133a to 133d, respectively, that contain records regarding quote information for the same RFQ, extracted from the quote database 133. Each record in the quote databases 133a to 133d includes a quote ID identifying quote information, a status, information identifying a market maker that is the provider of the quote information, a provision time indicating the time of the quote information provided, and a provided price (quote). Here, the provided price indicates an ask price.

FIG. 9 illustrates a first example of the processing performed by the trade request processing unit using the status.

The example of FIG. 9 assumes that, at 10:10:10, the provided price of 1,003 yen included in the quote information with quote ID "15" from the market maker MM1 is the best quote, and therefore this quote information is presented to the investor 21 side. It is also assumed that a trade execution request requesting the execution of a trade based on the quote information is sent and is then received by the brokerage system 100 at 10:10:11.

In response to the trade execution request, the trade request processing unit 142 of the brokerage system 100 confirms the status of the quote information with the quote ID "15" specified by the trade execution request. Referring to the example of FIG. 9, the quote information has a status of "Open," and therefore the trade request

processing unit 142 continues the processing to execute the trade based on the quote information.

FIG. 10 illustrates a second example of the processing performed by the trade request processing unit
5 using the status.

As in FIG. 9, the example of FIG. 10 assumes that the quote information with quote ID "15" from the market maker MM1 is presented to the investor 21 side at 10:10:10, and then the brokerage system 100 receives a trade execution
10 request requesting the execution of a trade based on this quote information at 10:10:11.

In response to the trade execution request, the trade request processing unit 142 of the brokerage system 100 confirms the status of the quote information with the
15 quote ID "15" specified by the trade execution request. At this time, new quote information with quote ID "16" is already provided by the market maker MM1, so that the status of the quote information with the quote ID "15" specified by the trade execution request is already updated to
20 "Overwritten". Therefore, the trade based on the quote information with quote ID "15" fails to execute.

In this case, the trade request processing unit 142 then extracts the quote information with a status of "Open" provided by the market makers MM1 to MM3 from the
25 quote database 133b, and extracts the best quote information from the extracted quote information. Referring to the example of FIG. 10, the quote information with quote IDs

"14", "16", and "17" is extracted, and then the quote information with quote ID "17" is extracted as the best quote information therefrom.

The trade request processing unit 142 determines
5 whether the provided price (quote) included in the extracted quote information with quote ID "17" is equal to the provided price (quote) included in the quote information with the quote ID "15" specified by the trade execution request. Referring to the example of FIG. 10, these provided prices
10 are equal to each other. Therefore, the trade request processing unit 142 continues the processing to execute the trade based on the quote information with quote ID "17". As a result, the trade between the investor 21 and the market maker MM2 that is the provider of the quote information is
15 executed.

FIG. 11 illustrates a third example of the processing performed by the trade request processing unit using the status.

As in FIGS. 9 and 10, the example of FIG. 11
20 assumes that the quote information with quote ID "15" from the market maker MM1 is presented to the investor 21 side at 10:10:10, and then the brokerage system 100 receives a trade execution request requesting the execution of a trade based on this quote information at 10:10:11.

25 In response to the trade execution request, the trade request processing unit 142 of the brokerage system 100 confirms the status of the quote information with the

quote ID "15" specified by the trade execution request. At this time, new quote information with quote ID "16" is already provided by the market maker MM1, so that the status of the quote information with the quote ID "15" specified
5 by the trade execution request is already updated to "Overwritten". Therefore, the trade based on the quote information with quote ID "15" fails to execute.

In this case, the trade request processing unit 142 then extracts the quote information with a status "Open"
10 provided by the market makers MM1 to MM3 from the quote database 133c, and extracts the best quote information from the extracted quote information. Referring to the example of FIG. 11, the quote information with quote IDs "14", "16", and "17" is extracted, and then the quote information with
15 quote ID "17" is extracted as the best quote information therefrom.

The trade request processing unit 142 determines whether the provided price (quote) included in the extracted quote information with quote ID "17" is equal to the provided
20 price (quote) included in the quote information with the quote ID "15" specified by the trade execution request. Referring to the example of FIG. 11, these provided prices are not equal to each other. As a result, the trade fails to execute.

25 FIG. 12 illustrates a fourth example of the processing performed by the trade request processing unit using the status.

As in FIGS. 9 to 11, the example of FIG. 12 assumes that the quote information with quote ID "15" from the market maker MM1 is presented to the investor 21 side at 10:10:10, and then the brokerage system 100 receives a trade execution
5 request requesting the execution of a trade based on this quote information at 10:10:11.

In response to the trade execution request, the trade request processing unit 142 of the brokerage system 100 confirms the status of the quote information with the
10 quote ID "15" specified by the trade execution request. At this time, new quote information with quote ID "16" is already provided by the market maker MM1, so that the status of the quote information with the quote ID "15" specified by the trade execution request is already updated to
15 "Overwritten". Therefore, the trade based on the quote information with quote ID "15" fails to execute.

In this case, the trade request processing unit 142 then extracts the quote information with a status "Open" provided by the market makers MM1 to MM3 from the quote
20 database 133d, and extracts the best quote information from the extracted quote information. Referring to the example of FIG. 12, the quote information with quote IDs "14", "16", and "17" is extracted, and then the quote information with quote ID "16" is extracted as the best quote information
25 therefrom.

The trade request processing unit 142 determines whether the provided price (quote) included in the extracted

quote information with quote ID "16" is equal to the provided price (quote) included in the quote information with the quote ID "15" specified by the trade execution request. Referring to the example of FIG. 12, these provided prices
5 are not equal to each other. As a result, the trade fails to execute. In the example of FIG. 12, the best quote is a price that is more preferable for the investor 21, but the trade fails to execute under the above-described constraints.

The following describes examples of an entire
10 process to execute a trade with reference to FIGS. 13 to 15. As in FIGS. 9 to 12, FIGS. 13 to 15 assume that an RFQ requesting a buy trade for a certain issue is sent from the investor 21 side, and quotes are provided by the three market makers MM1 to MM3 in response to the RFQ.

15 FIGS. 13 and 14 are sequence diagrams illustrating a first example of the trade execution process.

(Step S31) The quote processing unit 141 of the brokerage system 100 extracts the best quote information from the quote information provided by the market makers MM1
20 to MM3 in response to an RFQ from the investor system 210 (this extraction is not illustrated). The example of FIG. 13 assumes that the quote information provided by the market maker MM1 is extracted as the best quote information. The quote processing unit 141 sends the extracted best quote
25 information to the trading agent system 220. Thereby, the best quote is presented to the investor 21 via the investor system 210.

(Step S32) In accordance with operations of the investor 21, the investor system 210 requests the execution of a trade at the presented best quote from the trading agent system 220. The trading agent system 220 sends a
5 trade execution request requesting the execution of the trade based on the best quote information received at step S31, and the brokerage system 100 receives this trade execution request.

(Step S33) The trade request processing unit 142
10 of the brokerage system 100 obtains the quote ID from the trade execution request and identifies the quote information (original quote information) with the obtained quote ID from the quote database 133. The trade request processing unit 142 obtains the status added to the identified quote
15 information and confirms whether the status is "Open" or "Overwritten".

(Step S34) It is assumed that the status is confirmed to be "Overwritten" at step S33. In this case, the trade with the market maker MM1 using the original quote
20 information fails to execute. The trade request processing unit 142 then extracts, from the quote database 133, the quote information with a status of "Open" among the quote information provided for the same RFQ by the market makers 23. The trade request processing unit 142 extracts the best
25 quote information including the best quote from the obtained quote information.

(Step S35) It is assumed that the quote

information from the market maker MM3 is extracted as the best quote information at step S34. The trade request processing unit 142 determines whether the provided price (quote) included in the extracted best quote information matches the provided price (quote) included in the original quote information.

(Step S36) It is assumed that these provided prices are determined to match at step S35. In this case, the trade request processing unit 142 starts a process to execute a trade with the market maker MM3, which is the provider of the best quote information, using the best quote information extracted at step S34. First, the trade request processing unit 142 sends an approval request for the trade (in this case, sell trade) based on the best quote information to the market maker system 230c corresponding to the market maker MM3.

(Step S37) The market maker system 230c notifies the brokerage system 100 of an approval result indicating that the trade is approved.

(Step S38a) The trade request processing unit 142 generates order information for placing a buy order at the provided price included in the above best quote information, and sends order request information including the generated order information to the securities company system 240 corresponding to the investor 21.

(Step S38b) The trade request processing unit 142 generates order information for placing a sell order at the

provided price included in the above best quote information, and sends order request information including the generated order information to the securities company system 250 corresponding to the market maker MM3.

5 In this connection, steps S38a and S38b may be executed in reverse order.

 (Step S39a) The securities company system 240 receives the order request information sent at step S38a, and sends the securities exchange system 260 order
10 information for placing the buy order at the above provided price on the basis of the order request information, thereby placing the buy order.

 (Step S39b) The securities company system 250 receives the order request information sent at step S38b,
15 and sends the securities exchange system 260 order information for placing the sell order at the above provided price on the basis of the order request information, thereby placing the sell order.

 The securities exchange system 260 executes the
20 trade on the basis of the respective order information sent at steps S39a and S39b. When the trade is executed (filled), this execution of the trade is reported to the securities company systems 240 and 250.

 (Step S40a) The securities company system 240
25 notifies the brokerage system 100 of the trade result indicating that the buy order has been executed.

 (Step S40b) The securities company system 250

notifies the brokerage system 100 of the trade result indicating that the sell order has been executed.

(Step S41) The trade request processing unit 142 of the brokerage system 100 notifies the investor system 210
5 via the trading agent system 220 of the trade result indicating that the trade has been executed.

FIG. 15 is a sequence diagram illustrating a second example of the trade execution process.

(Step S51) As in step S31 of FIG. 13, the best
10 quote information is extracted from the quote information provided by the market makers MM1 to MM3, and the extracted best quote information is sent to the trading agent system 220. The best quote is then presented to the investor 21 via the investor system 210. Here, as in FIG. 13, it is
15 assumed that the quote information provided by the market maker MM1 is extracted as the best quote information.

(Step S52) As in step S32 of FIG. 13, a trade execution request requesting the execution of a trade based on the sent best quote information is sent to the brokerage
20 system 100, and is then received by the brokerage system 100.

(Step S53) As in step S33 of FIG. 13, the trade request processing unit 142 of the brokerage system 100 obtains the quote ID from the trade execution request and
25 identifies the quote information (original quote information) with the obtained quote ID from the quote database 133. The trade request processing unit 142 obtains

the status added to the identified quote information and confirms whether the status is "Open" or "Overwritten".

(Step S54) It is assumed that the status is confirmed to be "Open" at step S53. In this case, it is possible to execute a trade with the market maker MM1 using the original quote information. The trade request processing unit 142 starts a process to execute the trade with the market maker MM1 using the above best quote information. To this end, the trade request processing unit 142 first sends an approval request for the trade (in this case, sell trade) based on the best quote information to the market maker system 230a corresponding to the market maker MM1.

(Step S55) The market maker system 230a notifies the brokerage system 100 of an approval result indicating that the trade is approved.

Although not illustrated, the same process as steps S38a to S40a of FIG. 14 is thereafter performed between the brokerage system 100 and the securities company system 240. Meanwhile, the same process as steps S38b to S40b of FIG. 14 is performed between the brokerage system 100 and the securities company system 250 corresponding to the market maker MM1. In the manner described above, the trade using the above best quote information is executed. When the brokerage system 100 is notified that the trade has been executed, the brokerage system 100 notifies the investor system 210 via the trading agent system 220 of a trade result

indicating that the trade has been executed, as in step S41 of FIG. 14.

In the above-described second embodiment, when the brokerage system 100 receives a trade execution request
5 corresponding to a presented quote, the brokerage system 100 determines whether the quote provided by the market maker 23 that is the provider of the quote at that point in time matches the original quote. In the case where these quotes do not match, the brokerage system 100 then extracts the
10 best quote from the quotes provided by the plurality of market makers 23 at that point in time. Then, in the case where the extracted best quote and the original quote are equal to each other, the brokerage system 100 performs a process to execute a trade at the extracted best quote.
15 This approach makes it possible to reduce the likelihood of trade failures due to quote changes and thus to increase convenience for the investor 21 side.

The second embodiment has mainly described the case where the investor 21 requests a buy trade. The
20 processing in the second embodiment may also be applicable to the case where the investor 21 requests a sell trade. In this case, for example, at step S15 of FIG. 5 and step S26 of FIG. 8, quote information including the highest quote is extracted as the best quote information.

25 In addition, the processing functions of each of the apparatuses (for example, the trading brokerage apparatus 1 and brokerage server 110) and systems (for

example, the trading system 3, brokerage system 100, investor system 210, trading agent system 220, market maker systems 230, securities company systems 240 and 250, and securities exchange system 260) described in the above-described embodiments may be implemented by using a computer. In this case, a program is provided, which describes processes for the functions of an individual apparatus. A computer implements the processing functions by executing the program. The program describing the intended processes may be stored on a computer-readable storage medium. Computer-readable storage media include magnetic storage devices, optical discs, semiconductor memories, and others. Magnetic storage devices include hard disk drives (HDD), magnetic tapes, and others. Optical discs include compact discs (CDs), digital versatile discs (DVDs), Blu-ray discs (BDs, registered trademark), and others.

To distribute the program, portable storage media, such as DVDs and CDs, on which the program is stored, may be put on sale, for example. Alternatively, the program may be stored in a storage device of a server computer and may be transferred from the server computer to other computers over a network.

A computer that is to execute the above program stores in its local storage device the program recorded on a portable storage medium or transferred from the server computer, for example. Then, the computer reads the program from the local storage device and runs the program. The

computer may run the program directly from the portable storage medium. Alternatively, the computer may sequentially run the program while receiving the program being transferred from the server computer over a network.

- 5 In one aspect, it is possible to reduce the likelihood of trade failures for securities due to quoted price changes.

CLAIMS

What is claimed is:

1. A trading brokerage method executed by a
5 computer, the trading brokerage method comprising:
 - presenting a first quoted price to a trading
system on an investor side, the first quoted price being
best among quoted prices provided by a plurality of market
makers;
 - 10 determining, upon receiving an execution request
for a trade at the first quoted price from the trading system,
whether a second quoted price currently provided by a first
market maker that is a provider of the first quoted price
matches the first quoted price;
 - 15 performing, upon determining that the second
quoted price matches the first quoted price, a process to
execute the trade at the first quoted price;
 - extracting, upon determining that the second
quoted price does not match the first quoted price, a third
20 quoted price that is best from quoted prices currently
provided by the plurality of market makers;
 - performing, upon determining that the third quoted
price matches the first quoted price, a process to execute
the trade at the third quoted price; and
 - 25 notifying, upon determining that the third quoted
price does not match the first quoted price, the trading
system that the trade has failed to execute.

2. The trading brokerage method according to claim 1, wherein the determining whether the second quoted price matches the first quoted price includes

5 determining whether the first quoted price has been updated by the first market maker between the presenting of the first quoted price and the receiving of the execution request, and

 determining, upon determining that the first
10 quoted price has been updated, that the second quoted price does not match the first quoted price.

3. The trading brokerage method according to claim 1, wherein

15 upon determining that the second quoted price matches the first quoted price, the process to execute the trade at the first quoted price between the investor and the first market maker is performed, and

 upon determining that the third quoted price
20 matches the first quoted price, the process to execute the trade at the third quoted price between the investor and a second market maker that is a provider of the third quoted price is performed.

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

 requesting, upon determining that the second

quoted price matches the first quoted price, an approval for the trade at the first quoted price from the first market maker; and

requesting, upon determining that the third quoted
5 price matches the first quoted price, an approval for the trade at the third quoted price from a second market maker that is a provider of the third quoted price.

5. A trading brokerage program that causes a
10 computer to perform a process comprising:

presenting a first quoted price to a trading system on an investor side, the first quoted price being best among quoted prices provided by a plurality of market makers;

15 determining, upon receiving an execution request for a trade at the first quoted price from the trading system, whether a second quoted price currently provided by a first market maker that is a provider of the first quoted price matches the first quoted price;

20 performing, upon determining that the second quoted price matches the first quoted price, a process to execute the trade at the first quoted price;

extracting, upon determining that the second quoted price does not match the first quoted price, a third
25 quoted price that is best from quoted prices currently provided by the plurality of market makers;

performing, upon determining that the third quoted

price matches the first quoted price, a process to execute the trade at the third quoted price; and

notifying, upon determining that the third quoted price does not match the first quoted price, the trading
5 system that the trade has failed to execute.