

[DESCRIPTION]

[Invention Title]

AUTOMATIC ORDER PROCESSING SERVER AND AUTOMATIC ORDER PROCESSING METHOD

[Technical Field]

The present disclosure relates to an automatic order processing server and an automatic order processing method. More specifically, the present disclosure relates to an automatic order processing server and an automatic order processing method for automating a process of processing a bunker oil order through robotic process automation (RPA).

[Background Art]

Robotic process automation (RPA) is a technology for replicating a repetitive and routine sequence of actions that humans perform through computers, that is, a technology for programming software instead of a physical robot for operation.

A business support system should be designed and implemented by functional items such as a database, a user interface, and data processing logic. On the other hand, RPA is a technology for defining in detail which item a human recognizes in an existing system or website, how to operate a mouse or keyboard, and where to enter data, and replicating it as it is.

Therefore, the introduction of RPA does not require any adjustments or modifications to a system, and developed unit processes are independent of each other. Accordingly, a development system and environment are simple, which makes development relatively simple.

These characteristics distinguish RPA as a differentiated solution, and related solutions are actively applied because the scope of automation can be expanded to

areas that are excluded from business automation system development such as acquiring and entering data that is difficult to interface with, or creating a report specific to a user and an organization that is difficult to standardize.

[Disclosure]

[Technical Problem]

The present disclosure is directed to providing an automatic order processing sever and automatic order processing method for automating a process of receiving a bunker oil order through robotic process automation (RPA).

The present disclosure is also directed to providing an automatic order processing sever and automatic order processing method for performing RPA communication by inputting a conversation using a predetermined tag.

The present disclosure is also directed to providing an automatic order processing sever and automatic order processing method for reflecting a preset unit price in a unit price table through RPA and then selecting a unit price in accordance with bunker oil conditions to offer the selected unit price to a client.

The present disclosure is also directed to providing an automatic order processing sever and automatic order processing method for creating a record of all estimate history and trade history through RPA by time period.

The present disclosure is also directed to providing an automatic order processing sever and automatic order processing method in which a price negotiation database construction unit stores oil trade influence factors as first data, stores second data generated in a trading process, and stores third data generated when the data generated during the trade is processed in real time, to construct a price negotiation database.

The present disclosure is also directed to providing an automatic order processing sever and automatic order processing method for adjusting a price to various situations using oil trade influence factors, data generated during a trading process, and data generated during a real-time process and offering the adjusted price.

Objects to be achieved by the present disclosure are not limited to those described above, and other objects which have not been described will be clearly understood by those skilled in the technical field to which the present disclosure pertains from the present specification and the accompanying drawings.

[Technical Solution]

One aspect of the present disclosure provides an automatic order processing server including a chat room management unit configured to open a chat room for chatting between a vendor terminal and a client terminal through a chat server, a message transmission and reception unit configured to provide, when a message is received from the client terminal through the chat room, the message to the vendor terminal and provide, when a message is received from the vendor terminal, the message to the client terminal, a price negotiation database construction unit configured to store price offer reference data and construct a price negotiation database, a price negotiation unit configured to offer an estimate price on the basis of the price offer reference data stored in a price negotiation database, a message management unit configured to determine, when a message is input through the chat room, a type of message by analyzing the message and automatically generate a response message to the message using the estimate price in accordance with the type of message, and an order reception processing unit configured to check an order sign-up condition on the basis of a message transmitted and received through the chat server and process order reception in accordance with a check result.

The price negotiation database construction unit may construct the price negotiation database by storing first data which is oil trade influence factors, storing second data generated in a trading process, and storing third data generated from real-time processing based on the data generated during the trade.

The price negotiation unit may set a price standard of each supply date for same-day trade on the basis of the first data, set a price standard at a time point of oil trade on the basis of the second data, and set a trading price standard for a peak oil trading period on the basis of the third data.

Another aspect of the present disclosure provides an automatic order processing method including opening a chat room for chatting between a vendor terminal and a client terminal through a chat server, when a message is input through the chat room, determining a type of message by analyzing the message, offering an estimate price in accordance with the type of message on the basis of price offer reference data prestored in a previously constructed price negotiation database, automatically generating a response message to the message using the estimate price in accordance with the type of message, and checking an order sign-up condition on the basis of the message and processing order reception in accordance with a check result.

The automatic order processing method may further include constructing the price negotiation database by storing first data which is oil trade influence factors, storing second data generated in a trading process, and storing third data generated from real-time processing based on the data generated during the trade.

The offering of the estimate price on the basis of the price offer reference data prestored in the previously constructed price negotiation database may include setting a price standard of each supply date for same-day trade on the basis of the first data, setting a price standard at a time point of oil trade on the basis of the second data, and

setting a trading price standard for a peak oil trading period on the basis of the third data.

[Advantageous Effects]

According to embodiments of the present disclosure, it is possible to automate a process of receiving a bunker oil order through robotic process automation (RPA).

According to embodiments of the present disclosure, it is possible to perform RPA communication by inputting a conversation using a predetermined tag.

According to embodiments of the present disclosure, it is possible to reflect a preset unit price in a unit price table through RPA and then select a unit price in accordance with bunker oil conditions to offer the selected unit price to a client.

According to embodiments of the present disclosure, it is possible to record all estimate history and trade history through RPA by time period.

According to embodiments of the present disclosure, it is possible to adjust price in accordance with various situations using oil trade influence factors, data generated in a trading process, and data generated from real-time processing.

[Description of Drawings]

Exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings such that the foregoing and other aspects of the present disclosure become clear to those of ordinary skill in the art to which the present disclosure pertains.

FIG. 1 is a network configuration diagram illustrating an automatic bunker oil trade system according to an embodiment of the present disclosure.

FIG. 2 is a block diagram illustrating an internal structure of an automatic order processing server according to an embodiment of the present disclosure.

FIG. 3 is a flowchart illustrating an automatic order processing method according to an embodiment of the present disclosure.

FIGS. 4 and 5 are example diagrams illustrating an automatic order processing process according to an embodiment of the present disclosure.

FIG. 6 is an example diagram illustrating provision of oil price, inventory, and weather information according to an embodiment of the present disclosure.

[Modes of the Invention]

The objects, features, and advantages of the present disclosure will be more obvious from the following detailed description in conjunction with the accompanying drawings. However, the present application can be modified in various ways and have several embodiments, and specific embodiments will be illustrated in the drawings and described in detail below.

Throughout the specification, like reference numerals refer to like components in principle. Also, components having the same function within the scope of the same idea illustrated in the drawings of each embodiment will be referred to by the same reference numerals, and reiterative description thereof will be omitted.

When detailed description of a known function or element related to the present application is determined to unnecessarily obscure the subject matter of the present application, the detailed description will be omitted. Also, numbers (e.g., first, second, and the like) used in the description process of the present specification are merely identification code for distinguishing one component from others.

In addition, the suffixes “module” and “unit” for components used in the following embodiments are given or used together only to facilitate the writing of the specification. Therefore, these terms do not have distinct meanings or roles therein.

In the following embodiments, singular forms include plural forms unless the context clearly indicates otherwise.

In the following embodiments, the term “include,” “have” or the like means that a feature or component described in the specification is present, and it does not preclude the possibility that one or more other features or components are added.

For convenience of description, the sizes of components may be exaggerated or reduced in the accompanying drawings. For example, the size and thickness of each component illustrated in the drawings are arbitrarily indicated for convenience of description, and the present invention is not necessarily limited to what is illustrated.

When an embodiment can be implemented differently, a specific process may be performed in a different order from the described order of the process. For example, two processes described in succession may be performed substantially simultaneously, or may be performed in a reverse order to a described order.

In the following embodiments, when components and the like are connected, the components may not only be directly connected but may also be indirectly connected with components interposed therebetween.

For example, in the present specification, when components and the like are electrically connected, the components may not only be directly electrically connected but may also be indirectly electrically connected with components interposed therebetween.

FIG. 1 is a network configuration diagram illustrating an automatic bunker oil trade system according to an embodiment of the present disclosure.

Referring to FIG. 1, the automatic bunker oil trade system includes a vendor terminal 100, a client terminal 200, an automatic order processing server 300, and a chat server 400.

When an estimate message is received from the client terminal 200 through the chat server 400, the automatic order processing server 300 provides one of an estimate offer message, a negotiation request message, an estimate approval message, and an estimate disapproval message using a price list table preset by the vendor in response to the estimate message.

To this end, the automatic order processing server 300 receives oil type-specific prices from the vendor terminal 100, stores the oil type-specific prices in a price list table, and updates the prestored oil type-specific price list table upon receiving a request for an update to prestored oil type-specific prices.

Subsequently, the automatic order processing server 300 opens a chat room for chatting with the client terminal 200 through the chat server 400. Here, the name of the chat room may be set to the purpose of the chat and a client name. For example, the name of the chat room may be set to “oil price estimate-client A” or the like.

Also, the automatic order processing server 300 causes a message, which is written in accordance with a predetermined instruction and format on the basis of the type of message through the chat room, to be input by each of the client terminal 200 and the vendor terminal 100.

According to an embodiment, when a message received from the client terminal 200 is an inquiry request message, the automatic order processing server 300 causes input of a message, in which a predetermined inquiry instruction and search condition items distinguished by a predetermined special character are written, such that the inquiry request message is generated.

For example, the automatic order processing server 300 causes input of an inquiry request message including “Inq. 1. customer identification information / YOSU / vessel identification information/ LSFO:200MT LSMGO:100MT.”

In other words, the automatic order processing server 300 causes input of the predetermined instruction “Inq” and the message “turn/vessel name/ port name/supply date/oil type/amount” in which search condition items distinguished by the predetermined character “/” are written.

According to another embodiment, when a message provided to the client terminal 200 is an estimate message for an inquiry request message, the automatic order processing server 300 causes input of a message obtained by adding an oil type-specific price to a predetermined estimate instruction and the data of the inquiry request message and then generation of the estimate message.

For example, the automatic order processing server 300 may cause generation of an inquiry request message including “clientA#1 / vessel identification information / BUSAN or YEOSU / MAR 16-MAR 21 / LSFO 850-1050MT/ LSMGO 60-90MT / 15:47-16:17 / 735 / 847 / MC\$0 /.”

According to another embodiment, when an order reception message corresponding to an estimate message is generated, the automatic order processing server 300 inserts a predetermined deal-done instruction into the content of the estimate message such that the order reception may be generated.

For example, the automatic order processing server 300 causes generation of an order reception message including “clientA#1 / vessel identification information / BUSAN or YEOSU / MAR 16-MAR 21 / LSFO 850-1050MT / LSMGO 60-90MT / 15:47-16:17 / 735 / 847 / MC\$0 /.”

According to another embodiment, the automatic order processing server 300 causes a negotiation request message received from the client terminal 200 to be generated by inserting a predetermined negotiation instruction into the content of an estimate message.

According to another embodiment, the automatic order processing server 300 provides a negotiation request message received from the client terminal 200 to the vendor terminal 100. When a price is adjusted by the vendor terminal 100 in response to the negotiation request message, the automatic order processing server 300 generates a negotiation result message by changing the price in the content of the negotiation request message and provides the negotiation result message to the client terminal 200.

When a message is input through the chat room, the automatic order processing server 300 determines the type of message by analyzing the message, which is written in accordance with a predetermined instruction and format on the basis of the type of message, and automatically generates a response message to the message in accordance with the type of message.

To this end, when a message is received from each of the client terminal 200 and the vendor terminal 100, the automatic order processing server 300 extracts a predetermined instruction by analyzing the message and determines the type of message in accordance with the type of predetermined instruction.

According to an embodiment, the automatic order processing server 300 may receive a message from the client terminal 200, extract a predetermined instruction by analyzing the message, and determine the message as an inquiry request message when the predetermined instruction is an inquiry instruction.

According to another embodiment, when a message is received from the client terminal 200, the automatic order processing server 300 may extract a predetermined instruction by analyzing the message and determine the message as an estimate message when the predetermined instruction is an estimate instruction.

According to the above embodiment, when the message received from the client terminal 200 is an estimate message, the automatic order processing server 300 automatically generates an estimate message obtained by adding an oil type-specific price item to the predetermined estimate instruction and the data of an inquiry request message.

According to another embodiment, when a message is received from the client terminal 200, the automatic order processing server 300 extracts a predetermined instruction by analyzing the message. When the predetermined instruction is a deal-done instruction, the automatic order processing server 300 may determine the message as an order reception message.

According to the above embodiment, when the message is received from the client terminal 200, the automatic order processing server 300 causes generation of an order reception message using the predetermined deal-done instruction and the data of an estimate message.

According to another embodiment, when a message is received from the client terminal 200, the automatic order processing server 300 extracts a predetermined instruction by analyzing the message. When the predetermined instruction is a negotiation instruction, the automatic order processing server 300 may determine the message as a negotiation request message.

According to another embodiment, the automatic order processing server 300 may provide a negotiation request message received from the client terminal 200 to the vendor terminal 100. When a price is adjusted by the vendor terminal 100 in response to the negotiation request message, the automatic order processing server 300 may generate a negotiation result message by changing the price in the content of the negotiation request message.

Also, the automatic order processing server 300 checks an order sign-up condition on the basis of a message transmitted and received through the chat server and processes order reception in accordance with the check result.

According to an embodiment, when the message is determined as an order reception message, the automatic order processing server 300 compares a price recorded in the order reception message with an estimated price and processes order reception in accordance with whether the price recorded in the order reception message is the same as the estimated price.

According to the above embodiment, when the price recorded in the order reception message is the same as the estimated price, the automatic order processing server 300 processes order reception in the case where the estimate has not expired, and does not process order reception in the case where the estimate has expired.

When an estimate message is received from the client terminal 200, the chat server 400 provides the estimate message to the automatic order processing server 300, receives any one of an estimate offer message, a negotiation request message, an estimate approval message, and an estimate disapproval message from the automatic order processing server 300 in response to the estimate message, and provides the received message to the client terminal 200.

FIG. 2 is a block diagram illustrating an internal structure of an automatic order processing server according to an embodiment of the present disclosure.

Referring to FIG. 2, the automatic order processing server 300 includes a chat room management unit 310, a message transmission and reception unit 320, an estimate determination unit 330, a message management unit 340, an order reception processing unit 350, an inventory management unit 360, a price negotiation database

construction unit 370, a price negotiation database 390, and a price negotiation unit 380.

The chat room management unit 310 opens a chat room for chatting between the vendor terminal 100 and the client terminal 200 through the chat server 400. Here, the chat room management unit 310 may set the name of the chat room to the purpose of the chat and a client name. For example, the name of the chat room may be set to “oil price estimate-client A” or the like.

When a message is received from the client terminal 200 through the chat room, the message transmission and reception unit 320 provides the message to the vendor terminal 100, and when a message is received from the vendor terminal 100, the message transmission and reception unit 320 provides the message to the client terminal 200.

The estimate determination unit 330 extracts an estimate price using a preset price table in accordance with the type of message and provides the estimate price.

According to an embodiment, when an ordering message is received during a period in which price-specific validity periods overlap, the estimate determination unit 330 extracts any one of valid prices and provides the extracted valid price.

The message management unit 340 causes a message, which is written in accordance with a predetermined instruction and format on the basis of the type of message, to be input by each of the client terminal 200 and the vendor terminal 100 through the chat room.

According to an embodiment, when a message received from the client terminal 200 is an inquiry request message, the message management unit 340 causes input of a message, in which a predetermined inquiry instruction and search condition

items distinguished by a predetermined special character are written, such that the inquiry request message is generated.

According to another embodiment, when a message provided to the client terminal 200 is an estimate message for an inquiry request message, the message management unit 340 causes input of a message obtained by adding an oil type-specific price to a predetermined estimate instruction and the data of the inquiry request message and then generation of the estimate message.

According to another embodiment, when an order reception message corresponding to an estimate message is generated, the message management unit 340 causes generation of the order reception message using a predetermined deal-done instruction and the content of the estimate message.

According to another embodiment, the message management unit 340 causes a negotiation request message received from the client terminal 200 to be generated by inserting a predetermined negotiation instruction into the content of an estimate message.

According to another embodiment, the message management unit 340 provides a negotiation request message received from the client terminal 200 to the vendor terminal 100. When a price is adjusted by the vendor terminal 100 in response to the negotiation request message, the message management unit 340 generates a negotiation result message by changing the price in the content of the negotiation request message and provides the negotiation result message to the client terminal 200.

When a message is input through the chat room, the message management unit 340 determines the type of message by analyzing the message which is written in accordance with a predetermined instruction and format on the basis of the type of

message, and automatically generates a response message to the message using the estimate price in accordance with the type of message.

According to an embodiment, the message management unit 340 may receive a message from the client terminal 200, extract a predetermined instruction by analyzing the message, and determine the message as an inquiry request message when the predetermined instruction is an inquiry instruction.

According to another embodiment, when a message is received from the client terminal 200, the message management unit 340 may extract a predetermined instruction by analyzing the message and determine the message as an estimate message when the predetermined instruction is an estimate instruction.

According to the above embodiment, when the message received from the client terminal 200 is an estimate message, the message management unit 340 automatically generates an estimate message obtained by adding an oil type-specific price item determined by the estimate determination unit 330 to the predetermined estimate instruction and the data of an inquiry request message.

According to another embodiment, when a message is received from the client terminal 200, the message management unit 340 extracts a predetermined instruction by analyzing the message. When the predetermined instruction is a deal-done instruction, the message management unit 340 may determine the message as an order reception message.

According to the above embodiment, when the message is received from the client terminal 200, the message management unit 340 causes generation of an order reception message by inserting the predetermined deal-done instruction into the content of an estimate message.

According to another embodiment, when a message is received from the client terminal 200, the message management unit 340 extracts a predetermined instruction by analyzing the message. When the predetermined instruction is a negotiation instruction, the message management unit 340 may determine the message as a negotiation request message.

According to another embodiment, the message management unit 340 may provide a negotiation request message received from the client terminal 200 to the vendor terminal 100. When a price is adjusted by the vendor terminal 100 in response to the negotiation request message, the message management unit 340 may generate a negotiation result message by changing the price in the content of the negotiation request message.

The order reception processing unit 350 checks an order sign-up condition on the basis of a message transmitted and received through the chat server and processes order reception in accordance with the check result.

According to an embodiment, when a message is determined as an order reception message, the order reception processing unit 350 compares a price recorded in the order reception message with an estimated price and processes order reception in accordance with whether the price recorded in the order reception message is the same as the estimated price.

According to the above embodiment, when the price recorded in the order reception message is the same as the estimated price, the order reception processing unit 350 processes order reception in the case where the estimate has not expired, and does not process order reception in the case where the estimate has expired.

The inventory management unit 360 reflects an increase or decrease of inventory in real time in accordance with trading by the price negotiation unit 380 and

updates price information on the basis of the information at a suitable time to stably manage inventory levels by date at a future point in time based on a trading date in the trading process. The inventory management unit 360 stores a current time-point base inventory and a date-specific forecasted inventory of major locations

According to an embodiment, the inventory management unit 360 may increase a forecasted oil inventory to reflect inventory information of each tank in accordance with product-specific production and incoming transportation schedules.

According to another embodiment, the inventory management unit 360 may decrease the forecasted oil inventory for the scheduled amount of shipping based on an outbound transportation schedule and an expected trading date generated by the order reception processing unit 350.

The price negotiation database construction unit 370 stores factors that may have direct and indirect effects on oil trades in externally accessible first data, in a price negotiation database.

The first data stored in the price negotiation database may include oil price information, futures information, exchange rate information, weather forecast information, trading ban information, and the like. The oil price information is international price information by oil type, which means trading price by major regions (Singapore/China/Japan/Korea/and the like).

The futures information is information including a paper price (securities market price) for each oil type and may include information about a future price of the product. The exchange rate information is affected by the fluctuation of the KRW/dollar exchange rate because, in the case of a KRW client, it is necessary to buy crude oil in dollars and sell products in KRW. The weather forecast information is

the weather forecast information of major ports, and in Korea, is mainly based on Ulsan, Busan, Yeosu, and Incheon ports.

The trading ban information is information about sanction-related vessels (e.g., US Office of Foreign Assets Control (OFAC) and the like).

The price negotiation database construction unit 370 generates second data by processing self-generated cumulative data on the basis of existing trade history of a supplier and then stores the second data.

The second data is self-generated cumulative data, which means historical information of the supplier generated from previous trades. The second data may include demand price elasticity, vessel supply and demand history, a cancellation rate, an accident rate, and the like.

Regarding the demand price elasticity, in the case of an export oil spot trade, agency sales are common in the form of a supplier-agent-shipper structure because the supplier is not guaranteed the creditworthiness of each individual shipper.

The cancellation rate is the rate of cancelling a deal after the deal is done. When the rate of abandoning contracted supply after deals are done due to a change of route, deterioration of port weather, a change of mooring period, and the like exceeds a usual rate, this is determined to be a frequent change of mind due to fluctuations in oil prices and used for separate recording and management.

The accident rate is the rate at which safety incidents, such as spills and the like, occur during supply, and is used to record and manage cases attributable to a main vessel, such as valve failure, pressure regulation failure, or the like.

The price negotiation database construction unit 370 generates third data by processing self-generated real-time data on the basis of second data generated during the trade and stores the third data. Here, the third data is continuously generated and

updated while the automatic order processing system processes the trade during a finite peak oil trading period. The third data includes competitiveness, current demand/sales status, and update information of the inventory management unit 360.

The competitiveness is a competition level for the same inquiry, which is used to determine whether supply request information for each vessel at the time point of trade is the same. The competitiveness is determined to be higher with an increase in the number of competitive clients.

The current demand/sales status is used to aggregate the number and volume of inquiries from which trade requests have been received at the current time point and recognize sign-up information of trade in real time to update a current status board and provide the current status board to a user.

The update information of the inventory management unit 360 is information about the amount of inventory on a scheduled supply date updated on the basis of the scheduled supply date included in a deal-done inquiry.

The price negotiation unit 380 may offer a price using the first data stored in the price negotiation database 390.

According to an embodiment, the price negotiation unit 380 may offer a price using oil type-specific international price information stored in the price negotiation database 390.

For example, when a period average of a product price in Zhoushan/Shanghai, China, a large port adjacent to South Korea, is more than \$5/ton lower than the period average in the South Korean market, and the year-over-year decline in domestic demand continues for more than three days, the price negotiation unit 380 may reduce a selling price by \$6/ton from the selling price in Zhoushan, China, because of the concern of demand leakage.

Also, the price negotiation unit 380 may offer a price using the futures information stored in the price negotiation database 390.

According to an embodiment, when selling a next-month product, the price negotiation unit 380 may offer a next-month price at a discount/premium to a current-month price on the basis of an indicator of the market's expectations for an oil price for the remaining duration of the current month and the next month in line with a fluctuating international futures market price.

For example, when the price of the next month's heavy fuel oil product for ships is at a level of +\$10/ton compared to the current month's price, the price negotiation unit 380 increases that level from the current month's price as a premium price. The price negotiation unit 380 may update an estimate of which a valid estimate time (the validity period of each estimate is generally about thirty minutes, after which a new estimate is sent out at a new price) has expired, by adjusting a premium/discount in real time in consideration of the volatile nature of the oil market and offer the price.

The price negotiation unit 380 may offer a price using the weather forecast information stored in the price negotiation database 390.

According to an embodiment, the price negotiation unit 380 may acquire weather conditions of each major port using daily weather forecast data, measure the bunkering difficulty of each port on the basis of the port weather conditions such as wave height/wind speed and the like, and then determine a price in accordance with the difficulty.

For example, when the current date is April 30, and on May 2 which is a future time point, a wave height is more than three meters and an average wind speed is more than 12 m/s, the price negotiation unit 380 may determine that the supply of a refueling

ship will become difficult at the future time point. When supply is distributed around the day on which a refueling ship is less likely to depart, there will be more requests for supply on May 1 and May 3 than on May 2, and demurrage is highly likely to occur. Accordingly, the price negotiation unit 380 may increase the price on May 1 and May 3, on which demurrage is expected, to reduce the supply burden on those dates.

Also, the price negotiation unit 380 may offer a price using second data stored in the price negotiation database 390.

According to an embodiment, the price negotiation unit 380 may determine price elasticity on the basis of cumulative trade data of a shipping company, determine the shipping company as a source of price-elastic demand in accordance with whether the price elasticity is a predetermined threshold or more or less than the predetermined threshold, and offer a price.

According to the above embodiment, when the price elasticity is the predetermined threshold or more, the price negotiation unit 380 may determine the shipping company as a source of price-elastic demand and offer a price with a premium level reduced by a specific ratio of a premium at a premium time.

According to the above embodiment, when the price elasticity is less than the predetermined threshold, the price negotiation unit 380 may determine the shipping company as a source of price-inelastic demand and offer a price with a premium level increased by a specific ratio of the premium at the premium time.

For example, when the price elasticity of demand for an increase in oil price is 1.1 which is greater than 1 on the basis of the Korean bunker wire price, which is the prevailing oil price on the day and the recent one-year cumulative trade data of shipping company A, the price negotiation unit 380 may determine shipping company A as a source of price-elastic demand and offer a price increased by a premium level

reduced by 10% of a premium at a premium time to prevent quitting. When the price elasticity of demand for an increase in oil price is 0.9 which is less than 1, the price negotiation unit 380 may determine shipping company A as a source of price-inelastic demand and increase the premium at the premium time by 10% to assign an additional unit price.

According to another embodiment, the price negotiation unit 380 may determine whether a shipping company continues trading or whether a shipping company is likely to newly join or quit on the basis of demand and supply history of a corresponding vessel and proceed with estimation.

For example, the price negotiation unit 380 may recognize a vessel that has no purchase history in the last two months with respect to the date of receipt of an initial inquiry as a new/quitting vessel and proceed with estimation by reducing the price by \$2/ton to \$5/ton in consideration of a calculated cost on the day of sale compared to the average selling price on the corresponding day to attract new trade.

According to another embodiment, the price negotiation unit 380 may make an estimation by adding a value calculated by dividing a minimum cost for transportation by the quantity to an initial estimate. The reasoning behind this is that, for a vessel that fails to perform a trade after the trade is signed, the price will be determined in consideration of expected damage caused by a cancellation such as a failure in a docking plan, a refueling schedule affected by rescheduling, or the like.

For example, in the case of a 500-ton inquiry, the price negotiation unit 380 may apply \$1 per ton. When a 500-ton inquiry is cumulatively generated, the price negotiation unit 380 may cumulatively assign the additional price up to three times.

According to another embodiment, the price negotiation unit 380 may proceed with estimation on the basis of an accident rate in accordance with whether the number of accidents is a specific number or more.

For example, when there is one or more accidents that are partly or wholly attributable to a main vessel, the price negotiation unit 380 may convert the cost of handling the accidents into a unit price and add unit prices to an estimate.

As another example, when stakeholder costs incurred by accidents (extra disaster control, fines for safety negligence, and the like) in 2022 is \$5,000, the price negotiation unit 380 may apply the amount to a unit sales price to make a one-year estimate for 2023.

As another example, the price negotiation unit 380 may provide an option of not-estimable for a vessel that has experienced two or more accidents attributable to the vessel in a year or one accident in each of consecutive years in consideration of the catastrophic impact of maritime safety accidents.

Also, the price negotiation unit 380 may offer a price using the third data stored in the price negotiation database 390.

According to an embodiment, when forecasted inventory is below a specific ratio of predetermined adequate inventory and low inventory is expected, the price negotiation unit 380 may make an estimate with an increased margin of a specific ratio of the average trading price of the day in consideration of an oil price and exchange rate for a vessel inquiry for receiving a supply for the period, thereby reducing a sales achievement ratio.

For example, when the current day is April 20, forecasted inventory for April 26 to April 28 is 20% below the adequate inventory, and thus low inventory is expected, the price negotiation unit 380 may make an estimate with an increased

margin of +\$8/ton above the average trading price of the day in consideration of an oil price and exchange rate for a vessel inquiry for receiving a supply for that period, thereby reducing a sales achievement ratio.

According to another embodiment, when forecasted inventory exceeds a specific ratio of predetermined adequate inventory and thus high inventory is expected, the price negotiation unit 380 may apply a margin discount of a specific ratio of the average trading price of the day to a price for an inquiry that is scheduled for supply, thereby clearing the high inventory.

As another example, when inventory production exceeds 15% of adequate inventory due to increased plant utilization on April 29 and thus high inventory is expected, the price negotiation unit 380 may apply a margin discount of \$10/ton to the average trading price of the day for inquiries that are scheduled for supply on April 29 to clear the high inventory.

The structure of the automatic order processing server 300 according to an embodiment of the present disclosure has been described above with reference to FIG. 2. Although not shown in the drawing, the automatic order processing server 300 described above may include a transceiver unit, a memory, and a controller.

The transceiver unit may communicate with any external devices including the vendor terminal 100, the client terminal 200 and the chat server 400. The automatic order processing server 300 may access a network through the transceiver unit to transmit and receive various data. The transceiver unit may be a wired type transceiver unit or a wireless type transceiver unit. Since the wired-type transceiver unit and the wireless-type transceiver unit each have advantages and disadvantages, the automatic order processing server 300 may be provided with both the wired-type transceiver unit and the wireless-type transceiver unit in some cases. Here, the

wireless-type transceiver unit may mainly use a wireless local area network (WLAN)-based communication scheme such as Wi-Fi. Alternatively, the wireless-type transceiver unit may use a cellular communication scheme, for example, Long-Term Evolution (LTE) or fifth generation (5G). However, a wireless communication protocol is not limited to the above examples, and it is possible to use any appropriate wireless-type communication scheme. Representative examples of the wired-type transceiver unit are a local area network (LAN) and Universal Serial Bus (USB) communication, and other communication schemes are also available.

The memory may store various information. Various data may be temporarily or semi-temporarily stored in the memory. Examples of the memory may be a hard disk drive (HDD), a solid state drive (SSD), a flash memory, a read-only memory (ROM), a random access memory (RAM), and the like. In addition to an operating system (OS) for operating the automatic order processing server 300 and a program for operating each element of the automatic order processing server 300, various data necessary for operations of the automatic order processing server 300 may be stored in the memory.

The controller may control overall operations of the automatic order processing server 300. To this end, the controller may load a program for the overall operations of the automatic order processing server 300 from the memory and execute the program. The controller may be implemented as an application processor (AP), a central processing unit (CPU), or a similar device in hardware, software, or a combination thereof. As hardware, the controller may be provided in the form of an electronic circuit for processing an electrical signal to perform a control function, and as software, may be provided in the form of a program or code for operating a hardware circuit.

FIG. 3 is a flowchart illustrating an automatic order processing method according to an embodiment of the present disclosure.

Referring to FIG. 3, the automatic order processing server 300 opens a chat room for chatting between the vendor terminal 100 and the client terminal 200 through the chat server 400 (operation S310).

When the message is input through the chat room, the automatic order processing server 300 determines the type of message by analyzing the message which is written in accordance with a predetermined instruction and format predetermined on the basis of the type of message (operation S320).

According to an embodiment of operation S320, when a message is received from each of the client terminal 200 and the vendor terminal 100, the automatic order processing server 300 extracts a predetermined instruction by analyzing the message and determines the type of message in accordance with the type of predetermined instruction.

According to an embodiment, the automatic order processing server 300 may receive a message from the client terminal 200, extract a predetermined instruction by analyzing the message, and determine the message as an inquiry request message when the predetermined instruction is an inquiry instruction.

According to another embodiment, when a message is received from the client terminal 200, the automatic order processing server 300 may extract a predetermined instruction by analyzing the message and determine the message as an estimate message when the predetermined instruction is an estimate instruction.

According to the above embodiment, when the message received from the client terminal 200 is an estimate message, the automatic order processing server 300 automatically generates an estimate message obtained by adding an oil type-specific

price item to the predetermined estimate instruction and the data of an inquiry request message.

According to another embodiment, when a message is received from the client terminal 200, the automatic order processing server 300 extracts a predetermined instruction by analyzing the message. When the predetermined instruction is a deal-done instruction, the automatic order processing server 300 may determine the message as an order reception message.

According to the above embodiment, when the message is received from the client terminal 200, the automatic order processing server 300 causes generation of an order reception message by inserting the predetermined deal-done instruction into the data of an estimate message.

According to another embodiment, when a message is received from the client terminal 200, the automatic order processing server 300 extracts a predetermined instruction by analyzing the message. When the predetermined instruction is a negotiation instruction, the automatic order processing server 300 may determine the message as a negotiation request message.

According to another embodiment, the automatic order processing server 300 may provide a negotiation request message received from the client terminal 200 to the vendor terminal 100. When a price is adjusted by the vendor terminal 100 in response to the negotiation request message, the automatic order processing server 300 may generate a negotiation result message by changing the price in the content of the negotiation request message.

The automatic order processing server 300 extracts an estimate price using a preset price table in accordance with the type of message and provides the estimate price (operation S330).

The automatic order processing server 300 automatically generates a response message to the message using the estimate price in accordance with the type of message (operation S340).

The automatic order processing server 300 checks an order sign-up condition on the basis of the message and processes order reception in accordance with the check result (operation S350).

According to an embodiment of operation S350, when the message is determined as an order reception message, the automatic order processing server 300 compares a price recorded in the order reception message with an estimated price and processes order reception in accordance with whether the price recorded in the order reception message is the same as the estimated price.

According to the above embodiment, when the price recorded in the order reception message is the same as the estimated price, the automatic order processing server 300 processes order reception in the case where the estimate has not expired, and does not process order reception in the case where the estimate has expired.

FIGS. 4 and 5 are example diagrams illustrating an automatic order processing process according to an embodiment of the present disclosure.

Referring to FIGS. 4 and 5, the automatic order processing server 300 causes a message, which is written in accordance with a predetermined instruction and format on the basis of the type of message, to be input by each of the client terminal 200 and the vendor terminal 100 through the chat room.

According to an embodiment, when a message received from the client terminal 200 is an inquiry request message, the automatic order processing server 300 causes input of a message, in which a predetermined inquiry instruction and search

condition items distinguished by a predetermined special character are written, such that the inquiry request message is generated.

For example, the automatic order processing server 300 causes generation of an inquiry request message including “Inq. 1. customer identification information / YOSU / vessel identification information / LSFO:200MT LSMGO:100MT” as shown in FIG. 4.

According to another embodiment, when a message provided to the client terminal 200 is an estimate message for an inquiry request message, the automatic order processing server 300 causes input of a message obtained by adding an oil type-specific price to a predetermined estimate instruction and the data of the inquiry request message and then generation of the estimate message.

According to another embodiment, when an order reception message corresponding to an estimate message is generated, the automatic order processing server 300 inserts a predetermined deal-done instruction into the content of the estimate message such that the order reception may be generated.

According to another embodiment, the automatic order processing server 300 causes a negotiation request message received from the client terminal 200 to be generated by inserting a predetermined negotiation instruction into the content of an estimate message.

According to another embodiment, the automatic order processing server 300 provides a negotiation request message received from the client terminal 200 to the vendor terminal 100. When a price is adjusted by the vendor terminal 100 in response to the negotiation request message, the automatic order processing server 300 generates a negotiation result message by changing the price in the content of the

negotiation request message and provides the negotiation result message to the client terminal 200.

For example, the automatic order processing server 300 provides an instruction used for generating a negotiation request message and the content of a negotiation request message together such that a negotiation request message may be generated as shown in FIG. 5.

FIG. 6 is an example diagram illustrating provision of oil price, inventory, and weather information according to an embodiment of the present disclosure.

Referring to FIG. 6, the automatic order processing server 300 causes a message, which is written in accordance with a predetermined instruction and format on the basis of the type of message, to be input by each of the client terminal 200 and the vendor terminal 100 through a chat room.

According to an embodiment, when a message is received from the client terminal 200, the automatic order processing server 300 extracts a predetermined instruction by analyzing the received message. When the extracted instruction is a market price instruction, the automatic order processing server 300 may determine the received message as a market price request message.

According to the above embodiment, when the message received from the client terminal 200 is a market price request message, the automatic order processing server 300 may automatically generate a market price notification message.

For example, the automatic order processing server 300 provides key information about trade with respect to July 10, 2023, at the current time, as shown in FIG. 6. The key information about trade may include an exchange rate, a crude oil price, LSFO Korea, LSFO China, and LSFO Singapore. For example, when the exchange rate is 1,307 KRW/dollar, the crude oil price is \$73.37/barrel of crude oil

(BBL), LSFO KOREA is \$560.24/ MT (the change of a current price compared to the previous day's close + \$16.11/MT), LSFO China is \$565.61/MT (the change of a current price compared to the previous day's close + \$14.25/MT), and LSFO Singapore is \$550.21/MT (the change of a current price compared to the previous day's close + \$13.38/MT), forecasted LSFO inventory/weather information (unit: MT) is as shown in FIG. 6.

Referring to FIG. 6, it can be seen that forecasted LSFO inventory/weather information for the Ulsan region is displayed in a graph and table. Specifically, it can be seen that the recommended LSFO selling price is \$660/MT for less than 100 MT, \$650/MT for 100 MT or more, and \$645/MT for more than 300 MT. Also, it can be seen that expected LSFO sales for the day is 3,800 MT.

The features, structures, effects, and the like described in the above embodiments are included in at least one embodiment of the present disclosure and are not necessarily limited to only one embodiment. Further, the features, structures, effects, and the like illustrated in each embodiment can be combined or modified for implementation in other embodiments by those of ordinary skill in the art to which the embodiments pertain. Accordingly, the content related to such combinations and modifications should be construed as falling within the scope of the present disclosure.

Although embodiments have been mainly described above, these are merely illustrative and do not limit the present invention. Those skilled in the art to which the present invention pertains should understand that several modifications and applications that have not been described above are possible without departing from the essential characteristics of the present embodiments. In other words, each component specifically presented in the embodiments may be modified for implementation. In addition, differences associated with these modifications and

applications are to be construed as falling within the scope of the present invention defined by the appended claims.

[Industrial Applicability]

The automatic order processing server and automatic order processing method described above can be applied to the field of bunker oil distribution.

[CLAIMS]

[Claim 1]

An automatic order processing server, comprising:

a chat room management unit configured to open a chat room for chatting between a vendor terminal and a client terminal through a chat server;

a message transmission and reception unit configured to provide, when a message is received from the client terminal through the chat room, the message to the vendor terminal and provide, when a message is received from the vendor terminal, the message to the client terminal;

a price negotiation database construction unit configured to store price offer reference data and construct a price negotiation database;

a price negotiation unit configured to offer an estimate price on the basis of the price offer reference data stored in a price negotiation database;

a message management unit configured to determine, when a message is input through the chat room, a type of message by analyzing the message and automatically generate a response message to the message using the estimate price in accordance with the type of message; and

an order reception processing unit configured to check an order sign-up condition on the basis of a message transmitted and received through the chat server and process order reception in accordance with a check result.

[Claim 2]

The automatic order processing server of claim 1, wherein the price negotiation database construction unit constructs the price negotiation database by storing first data which is oil trade influence factors, storing second data generated in a trading process,

and storing third data generated from real-time processing based on the data generated during the trade.

[Claim 3]

The automatic order processing server of claim 2, wherein the price negotiation unit sets a price standard of each supply date for same-day trade on the basis of the first data, sets a price standard at a time point of oil trade on the basis of the second data, and sets a price standard for a peak oil trading period on the basis of the third data.

[Claim 4]

An automatic order processing method performed by an automatic order processing server, the automatic order processing method comprising:

opening a chat room for chatting between a vendor terminal and a client terminal through a chat server;

when a message is input through the chat room, determining a type of message by analyzing the message;

offering an estimate price in accordance with the type of message on the basis of price offer reference data prestored in a previously constructed price negotiation database;

automatically generating a response message to the message using the estimate price in accordance with the type of message; and

checking an order sign-up condition on the basis of the message and processing order reception in accordance with a check result.

[Claim 5]

The automatic order processing method of claim 4, further comprising constructing the price negotiation database by storing first data which is oil trade

influence factors, storing second data generated in a trading process, and storing third data generated from real-time processing based on the data generated during the trade.

[Claim 6]

The automatic order processing method of claim 5, wherein the offering of the estimate price on the basis of the price offer reference data prestored in the previously constructed price negotiation database comprises setting a price standard of each supply date for same-day trade on the basis of the first data, setting a price standard at a time point of oil trade on the basis of the second data, and setting a trading price standard for a peak oil trading period on the basis of the third data.