

**ONLINE TRANSACTION INFORMATION SECURITY SYSTEM AND ONLINE
TRANSACTION INFORMATION SECURITY METHOD**

CROSS REFERENCE TO RELATED APPLICATION

This application claims the benefit of Korean Patent Application No. 10-2018-0044619 filed with the Korean Intellectual Property Office on April 17, 2018, the disclosures of which are incorporated herein by reference.

TECHNICAL FIELD

[0001] Exemplary embodiments according to the present disclosure relate to the security of online transaction information, and more particularly, to a security system for online transaction information with enhanced security to safely trade a virtual currency and a security method for online transaction information.

BACKGROUND ART

[0002] In recent times, Internet virtual currency has been widely garnering attention. A virtual currency is a digital

currency or electronic currency that is used in an electronic form without an actual object such as a bill or a coin in a virtual space connected to a network. According to the definition of the virtual currency by the European Central Bank (ECB), the United States Department of the Treasury, and the European Banking Authority (EBA), a virtual currency is a digital currency that is not controlled by the government and is rather issued and managed by the developer to be used only in a particular virtual community. According to this definition, most cryptocurrencies are digital currencies as well as virtual currencies.

[0003] Bitcoin is an online cryptocurrency based on the blockchain technology. Bitcoin is designed to allow individuals to freely perform financial transactions such as transfers in a peer-to-peer network on a global basis without a central bank. It is virtually impossible to hack into the bitcoin network, because the ledger is distributed and stored in servers of various users in the global scale based on the blockchain technology. Bitcoin uses SHA-256 as a hash-function.

[0004] Bitcoin is not a currency used in real life, but a virtual currency used in online transactions. It is operated based on a method of paying back in a virtual currency in return for

solving a very difficult mathematical problem presented by a computer. Bitcoin was released as an open source under the MIT license, and a variety of altcoins such as Ethereum, Ethereum Classic, Ripple, Litecoin, Elcoin, Dash, Monero, JetCash and Quantum were created. Bitcoin is a kind of key currency among various altcoins.

[0005] In general, a Bitcoin account is called "E-wallet," each of which is given a unique number consisting of roughly 30 characters including a combination of numbers, lowercase and uppercase letters of the English alphabet, to perform transactions for personal authentication and currency transactions based on the cryptographic system of a public key interface. The public key interface of an Internet cryptocurrency includes a public key for the purpose of public trading and a private key dependent on the corresponding public key. The public key corresponds to an account number of an Internet cryptocurrency.

[0006] Conventionally, businesses using loyalty points, such as online shopping sites, banks, credit card companies, give out points to their members as bonuses according to transaction results based on transactions or sales of goods or the use of services, or in a promotional event, and allow the members to

exchange the points for cyber money. Through the use of such loyalty points, businesses generate revenues from transactions, sales or use.

[0007] Meanwhile, Korean Patent Application No. 10-2017-0142374 discloses a transfer system and method using a virtual currency, wherein money is transferred to a third party through Bitcoin, which allows the transfer of money in an easier, faster and safer manner than conventional methods. Moreover, it generates revenues by purchasing a Bitcoin with the money deposited for transfer and then searching for a bitcoin gateway (bitcoin exchange) with a highest rate in real time to sell the Bitcoin purchased from the bitcoin gateway.

[0008] However, due to a recent rise in the interest of cryptocurrencies, hackers have been hacking into the cryptocurrency gateways (exchanges), causing considerable damage to the cryptocurrency gateways, leading to their bankruptcy. By way of example, "Ubit," a cryptocurrency gateway (exchange) in Korea, lost coins as a result of hacking and went into bankruptcy in December 2017. In this regard, there is an urgent need for security technology that ensures safe cryptocurrency transactions in spite of the occurrence of hacking into cryptocurrency gateways (exchanges).

DISCLOSURE OF INVENTION

PROBLEM TO BE SOLVED BY THE INVENTION

[0009] The present disclosure has been conceived under the circumstances set forth above and provides a security system for online transaction information with enhanced security to safely trade a virtual currency and a security method for online transaction information.

MEANS FOR SOLVING PROBLEM

[0010] In order to achieve the aforementioned objective, a security method for online transaction information conducted in a dealing coin broker module connected to a plurality of member terminals provided with an electronic wallet module via an internet network according to an exemplary embodiment of the present disclosure, the method includes:

[0011] receiving, by the dealing coin broker module, dealing coin transaction request information for selling a dealing coin owned by a first member from a first member terminal provided

with a first electronic wallet module, and storing the information in a database; when the dealing coin broker module receives dealing coin transaction request information for purchasing a dealing coin from a second member terminal provided with a second electronic wallet module, transmitting a bank account number and payment amount information stored in the database to the second member terminal provided with the second electronic wallet module;

[0012] when the dealing coin broker module transmits payment verification request information to the first member terminal provided with the first electronic wallet module, and when the payment verification request information is inputted by the first member terminal in response, transmitting information on the dealing coin intended to be sold by the first member terminal to the second member terminal provided with the second electronic wallet module; receiving, by the second electronic wallet module, the information on the dealing coin intended to be sold by the first member terminal while being encrypted from the dealing coin broker module, and storing the encrypted information in a sub-account;

[0013] when the dealing coin broker module transmits authentication request information for verifying whether the sale is performed by a legitimate owner to the first member terminal intended to sell the dealing coin information, and

receives authentication success information from the first member terminal in response, transmitting dealing coin decryption information to the second member terminal provided with the second electronic wallet module which purchased the dealing coin information;

[0014] when the dealing coin decryption information for the dealing coin information owned by the first member is inputted from the dealing coin broker module, connecting, by the second electronic wallet module, to the dealing coin broker module to thereby transmit dealing coin owner change request information including the dealing coin information owned by the first member and the dealing coin decryption information; and receiving, by the second electronic wallet module, dealing coin information owned by the second member and dealing coin decryption information from the dealing coin broker module, and storing the information in a main account.

[0015] According to an exemplary embodiment of the present disclosure, the security method further includes: receiving dealing coin transfer request information for transferring a dealing coin from the first member terminal provided with the first electronic wallet module to the second member terminal provided with the second electronic wallet module, and storing the information in the database;

[0016] when the dealing coin broker module transmits verification information which verifies the dealing coin transfer request to the second member terminal provided with the second electronic wallet module and verification response information is inputted, receiving information on the dealing coin from the first member terminal provided with the first electronic wallet module, and transmitting the information on the dealing coin to the second member terminal provided with the second electronic wallet module; receiving, by the second electronic wallet module, the information on the dealing coin transferred by the first member terminal from the dealing coin broker module, and storing the information in a sub-account;

[0017] when the dealing coin broker module transmits authentication request information for verifying whether the transfer is performed by a legitimate owner to the first member terminal which transferred the information on the dealing coin, and receives authentication success information from the first member terminal in response, transmitting dealing coin decryption information to the second member terminal provided with the second electronic wallet module;

[0018] when the dealing coin decryption information for the dealing coin information owned by the first member is inputted from the dealing coin broker module, connecting, by the second electronic wallet module, to the dealing coin broker module to

thereby transmit dealing coin owner change request information including the dealing coin information owned by the first member and the dealing coin decryption information; and receiving, by the second electronic wallet module, dealing coin information owned by the second member and dealing coin decryption information from the dealing coin broker module, and storing the information in a main account.

[0019] According to an exemplary embodiment of the present disclosure, a security system for online transaction information, the system including an electronic wallet module operated by a user terminal and a dealing coin broker module operated by a server connected to the user terminal via an internet network,

[0020] the electronic wallet module includes: a storing unit including a main account to store one's own dealing coin information and a sub-account to store information on a dealing coin owned by another party; and a first transaction processing unit to generate dealing coin transaction request information for selling one's own dealing coin in response to a user input to thereby transmit the information to the dealing coin broker module, to receive payment verification request information for inquiring whether the payment is made by a buyer of the dealing coin from the dealing coin broker module to thereby display the information, to generate payment result information in response

to a user input to thereby transmit the information to the dealing coin broker module, and to transmit the dealing coin information stored in the main account to the dealing coin broker module according to a request from the dealing coin broker module, [0021] wherein the first transaction processing unit generates dealing coin transaction request information for purchasing a dealing coin owned by another party in response to a user input to thereby transmit the information to the dealing coin broker module, and when decryption information for the dealing coin owned by another party is inputted from the dealing coin broker module, the first transaction processing unit connects to a dealing coin generating module to thereby transmit dealing coin owner change request information including the information on the dealing coin owned by another party and the decryption information for the dealing coin, and wherein the first transaction processing unit receives one's own dealing coin information and dealing coin decryption information from the dealing coin generating module to thereby store the information in the main account.

[0022] According to an exemplary embodiment of the present disclosure, the electronic wallet module further includes: a first transfer processing unit to generate dealing coin transfer request information in response to a user input to thereby transmit the information to the dealing coin broker module, to

receive verification information which verifies the dealing coin transfer request information transmitted from the dealing coin broker module to thereby display the verification information on a screen, and upon an input of response information from a user in response to the verification information which verifies the dealing coin transfer request, to display a transfer button on the screen, and upon an input of a transfer button press signal, to transmit, to the dealing coin broker module, the information on the dealing coin intended to be transferred by the user.

[0023] According to an exemplary embodiment of the present disclosure, the electronic wallet module further includes: a first authentication processing unit to transmit authentication result information to the dealing coin broker module by performing user authentication upon receipt of authentication request information for verifying whether a sale or transfer is conducted by a legitimate user of dealing coin information from the dealing coin broker module.

[0024] According to an exemplary embodiment of the present disclosure, the dealing coin broker module further includes: a database to store information on a member with a dealing coin transaction intention, dealing coin transaction request

information transmitted from the electronic wallet module, dealing coin transaction result information, dealing coin transfer request information, or dealing coin transfer result information; and a second transaction processing unit to receive dealing coin transaction request information for selling from the first member terminal provided with the first electronic wallet module to thereby store the information in the database, upon receipt of dealing coin transaction request information for purchasing the dealing of the first member from the second member terminal provided with the second electronic wallet module, to transmit a bank account number and payment amount information stored in the database to the second member terminal, after the transmission of payment verification request information to the first member terminal and the inputting, by the first member terminal, of the payment verification request information in response, to transmit information on the dealing coin intended to be sold by the first member terminal to the second member terminal.

[0025] According to an exemplary embodiment of the present disclosure, the dealing coin broker module further includes: a second transfer processing unit to receive dealing coin transfer request information for transferring from the first member terminal provided with the first electronic wallet module or

dealing coin transfer request information for receiving a transfer from the second member terminal provided with the second electronic wallet module to thereby store the information in the database,

[0026] after the transmission of dealing coin transfer request verification information to the first member terminal provided with the first electronic wallet module or to the second member terminal provided with the second electronic wallet module and the inputting of verification response information, to receive dealing coin information from the first member terminal provided with the first electronic wallet module to thereby transmit the dealing coin information to the second member terminal provided with the second electronic wallet module.

[0027] According to an exemplary embodiment of the present disclosure, the dealing coin broker module further includes: a second authentication processing unit to transmit authentication result information for verifying whether a sale or transfer of the dealing coin information is conducted by a legitimate user to the first member terminal provided with the first electronic wallet module, and to receive authentication result information from the first member terminal,

[0028] wherein when authentication success information of the first member intended to transfer the dealing coin is inputted

from the second authentication processing unit, the second authentication processing unit transmits dealing coin decryption information to the second member terminal from which the dealing coin is transferred.

EFFECT OF THE INVENTION

[0029] By a security method for online transaction information according to one or more exemplary embodiments of the present disclosure, even if a hacker hacks into a gateway and steals a dealing coin owned by another user to the hacker's own electronic wallet module, the dealing coin is initially stored in a sub-account of the electronic wallet module, and until the authentication procedures with the original owner of the dealing coin are completed, the dealing coin cannot be moved to a main account of the electronic wallet module. Thus, a virtual currency gateway using the security method for online transaction information according to one or more exemplary embodiments of the present disclosure can allow a customer to securely trade a virtual currency.

BRIEF DESCRIPTION OF DRAWINGS

[0030] Although exemplary embodiments of the present disclosure have been shown and described with reference to the accompanied drawings, the present invention is not limited to the described embodiments. Instead, it would be appreciated by one of ordinary skill in the art that changes may be made to these embodiments without departing from the principles and spirit of the invention, the scope of which is defined by the claims and their equivalents.

[0031] FIG. 1 is a block diagram illustrating an overall structure of a security system for processing online transaction information according to an exemplary embodiment of the present disclosure.

[0032] FIG. 2 is a block diagram illustrating a main configuration for processing online transaction information according to a first exemplary embodiment of the present disclosure.

[0033] FIG. 3 is a block diagram illustrating the configuration of a dealing coin generating module and an electronic wallet module illustrated in FIG. 2.

[0034] FIG. 4 is a block diagram illustrating the configuration of a dealing coin broker module illustrated in FIG. 2.

[0035] FIGS. 5 and 6 are flow charts illustrating a dealing coin transaction process performed by the dealing coin broker module according to an exemplary embodiment of the present disclosure.

[0036] FIGS. 7 and 8 are flow charts illustrating a dealing coin transfer process performed by the dealing coin broker module according to an exemplary embodiment of the present disclosure.

BEST MODE(S) FOR CARRYING OUT THE INVENTION

[0037]

Specific structural or functional descriptions of exemplary embodiments according to the present disclosure are provided only for the purpose of describing the embodiments according to the present inventive concept. Exemplary embodiments according to the present disclosure may be implemented in various forms without being limited to the exemplary embodiments described herein.

[0038] Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanied drawings to enable one of ordinary skill in the art to readily understand and reproduce the present disclosure.

[0039] According to the present disclosure, free coin refers to a kind of loyalty point given by businesses, such as online shopping sites, banks or credit card companies, to their members, according to transaction results based on transactions or sales of goods or the use of services, or in a promotional event. Dealing Coin refers to a virtual currency that is traded based on a cryptosystem using a public key interface for personal authentication and currency trading, such as Bitcoin.

[0040]

[0041] As shown in FIG. 1, a system for processing online transaction information according to an exemplary embodiment of the present disclosure includes a seller terminal (110), a buyer terminal (120), a financial server (130), and an Internet data center (IDC) (140) connected via an Internet network.

[0029] In the present disclosure, a seller terminal (110) and a buyer terminal (120) are merely distinguished for the

convenience of explaining respective functions of selling and purchasing, and both terminals have online transaction functions including transferring, selling and purchasing. The seller terminal (110) and the buyer terminal (120) may be provided as a smartphone, a tablet PC, or a desktop PC, etc. The financial server (130) processes the transfer of actual money, such as via bank transfer between the seller terminal (110) and the buyer terminal (120) with or without a bank account.

[0043] The IDC (140) is a station to provide server computers, network circuits, etc. A server in the IDC (140) is built and operated to store extensive information necessary for searches, shopping, games, education, etc. based on the Internet, and to gather thousands or millions of server computers which display the information on websites in a single location to thereby stably manage the computer servers. A server in the IDC (140) includes a processor for processing dealing coins and a database which stores progress information and result information on the transfer and transaction of the dealing coins. The progress information and the result information on the transfer and transaction of the dealing coins may also be stored in at least one remote server (not shown) connected to the IDC (140) and/or a seller terminal (110) and a buyer terminal (120). In such case, the seller terminal (110) and the buyer terminal (120) may

be provided as a plurality of terminals such as a smartphone, a tablet PC, or a desktop PC.

[0044]

[0045] As shown in FIG. 2, a main configuration for processing online transaction information according to a first exemplary embodiment of the present disclosure includes a dealing coin generating module (210), a plurality of electronic wallet modules (221, 222, 223), a dealing coin broker module (231) and a database (232). In the present disclosure, dealing coin collectively refers to a tradeable virtual currency applied within the scope of the present disclosure, such as Bitcoin or Altcoin.

[0046] The dealing coin generating module (210) converts a free coin of a seller or buyer into a dealing coin, and stores the dealing coin in a main account of the electronic wallet modules (221, 222, 223) of the seller or buyer. The dealing coin generating module (210) may be built in a server in the IDC (140). The plurality of electronic wallet modules (221, 222, 223) are operated in a terminal used by a seller or buyer, store dealing coin information generated by the dealing coin generating module (210), and sell or purchase dealing coin

information or proceed with the transfer of a dealing coin according to a user's request. In the present disclosure, free coin is a concept distinguished from dealing coin, which refers to a virtual coin issued during the process of an electronic commerce transaction and given to a buyer free of charge, including such as various kinds of bonuses and vouchers. In contrast to dealing coin, free coin is traded only in a predetermined open market for an electronic commerce transaction. Free coins can be converted into dealing coins at a predetermined rate or exchange rate so that the converted dealing coins can be exchanged with other types of cryptocurrencies or real currencies as general cryptocurrencies.

[0047] The dealing coin broker module (231) and the database (232) are built in a server in the IDC (140). The dealing coin broker module (231) relays a dealing coin transaction between a seller and a buyer, relays a dealing coin transfer, and processes user authentication for a secure transaction and transfer of dealing coins. The dealing coin broker module (231) may share some data of the dealing coin generating module (210), for example, member information.

[0048] The database (232) receives dealing coin transaction request information transmitted from the plurality of electronic

wallet modules (221, 222, 223) to the dealing coin broker module (231) to thereby store the information, and stores dealing coin transaction result information, dealing coin transfer request information, and dealing coin transfer result information. Even if a hacker hacks into a server in the IDC (140), stealing of a dealing coin by hacking would not occur since only dealing coin transaction information is stored in the server. Although not shown in the drawings, progress information and result information regarding such transfers and transactions may be transmitted to at least one remote server (not shown) connected to the IDC (140) by the dealing coin broker module (231) and/or the seller terminal (110) and the buyer terminal (120) and stored therein. In such case, the seller terminal (110) and the buyer terminal (120) may be provided as a plurality of terminals such as a smartphone, a tablet PC, or a desktop PC. Specifically, portable terminals such as a smartphone or a tablet PC are usually used to process a transaction request from a seller or a buyer, and a desktop PC may be used to store a transaction result.

[0049]

[0050] Hereinafter, a dealing coin generating module and an electronic wallet module are described with reference to FIGS.

3 and 4.

[0051] As shown in FIG. 3, the dealing coin generating module (210) may include a member information storing unit (211), a free coin information processing unit (212), a free coin information storing unit (213), a dealing coin information processing unit (214), and a dealing coin information storing unit (215). The dealing coin generating module (210) may be provided, for example, in an Internet home shopping server.

[0052] The member information storing unit (211) stores information on members who joined a membership of an Internet shopping site. Specifically, members can be classified into a plurality of membership levels according to a payment amount or a purchase amount, for example, a basic member, premium member, and a VIP member. The member information stores identification information on the member's terminal, such as a PC, a laptop, or a smartphone. In addition, the member information may store the member's name and birthday and bank account number.

[0053] The free coin information processing unit (212) may be configured to generate a free coin based on the values of goods purchased by the member in the Internet home shopping site, or the amount of purchased goods per day/week/month, and to store

the free coin in the free coin information processing unit (212). Furthermore, the free coin information processing unit (212) may be configured to generate different free coins according to the membership level.

[0054] Upon the input of information requesting the conversion of some or all of the free coins owned by the member into dealing coins, the dealing coin information processing unit (214) applies a predetermined conversion rate according to the membership level stored in the member information storing unit (211), or converts a free coin requested for conversion into a dealing coin based on information on the conversion conditions or conversion rate given at that time. The dealing coin information processing unit (214) may be configured to subtract a free coin from among the free coins stored in the free coin information storing unit (213) by the amount corresponding to the amount of free coins requested for conversion. The dealing coin information processing unit (214) transmits encrypted dealing coin information to an electronic wallet. The encrypted dealing coin information may include true owner information, such as the member's name and birthday. The dealing coin information storing unit (215) stores dealing coin decryption information.

[0055] Upon the input of dealing coin owner change request information including dealing coin information owned by another owner and another owner's dealing coin decryption information from a first electronic wallet, the dealing coin information processing unit (214) decrypts another owner's dealing coin information and transmits dealing coin information encrypted under the name of the first electronic wallet to the first electronic wallet.

[0056]

[0057] As shown in FIG. 3, an electronic wallet module (310) may include a storing unit (311), a transaction processing unit (312), a transfer processing unit (313) and an authentication processing unit (314). The electronic wallet module (310) is operated in the seller terminal (110) and the buyer terminal (120) such as a smartphone, a tablet PC, or a desktop PC.

[0058] The storing unit (311) stores an operating program and data. The storing unit (311) stores information on a main account and a sub-account. The sub-account stores dealing coin information of a previous owner that is not decrypted. The main account stores one's own dealing coin information including encryption information. The electronic wallet module (310)

initially stores dealing coin information of another owner stored in the sub-account, and converts the dealing coin information of another owner stored in the sub-account into one's own dealing coin information including encryption information during the process of a normal online transaction according to an exemplary embodiment of the present disclosure, to thereby store one's own dealing coin information in the main account.

[0059] The transaction processing unit (312) connects to a dealing coin broker module to thereby transmit dealing coin transaction request information, and processes a dealing coin transaction in communication with the dealing coin broker module. For example, the dealing coin transaction request information may be associated with any one of a sale or a purchase of a dealing coin. The dealing coin transaction request information associated with a purchase may include information on a dealing coin desired for purchase and dealing coin buyer information.

[0060] In the case of selling one's own dealing coin, the transaction processing unit (312) transmits dealing coin transaction request information to the dealing coin broker module and receives, from the dealing coin broker module, payment verification request information which verifies whether

the dealing coin buyer paid the fee to display the information on a screen. The transaction processing unit (312) transmits payment result information to the dealing coin broker module in response to a user input. The transaction processing unit (312) transmits dealing coin information stored in the main account to the dealing coin broker module at the request of the dealing coin broker module.

[0061] In the case of purchasing another owner's dealing coin, the transaction processing unit (312) receives an input of another owner's dealing coin information from the dealing coin broker module to store it in the sub-account. When decryption information for another owner's dealing coin information is inputted from the dealing coin broker module, the transaction processing unit (312) connects to the dealing coin generating module (210) to thereby transmit dealing coin owner change request information including another owner's dealing coin information and another owner's dealing coin decryption information. The transaction processing unit (312) receives an input of one's own dealing coin information and dealing coin encryption information from the dealing coin generating module (210) and stores it in the main account.

[0062] The transfer processing unit (313) connects to the

dealing coin broker module to thereby transmit dealing coin transfer request information, and processes a dealing coin transfer in communication with the dealing coin broker module. In general, a transfer is performed in pre-consensus between a sender and a receiver of dealing coins. The dealing coin transfer request information may include, for example, a total amount of dealing coins to transfer, information on a receiver to receive the dealing coin, and information on a sender to transfer the dealing coin. Alternatively, the dealing coin transfer request information may include a total amount of dealing coins to be transferred, information on a sender to transfer the dealing coin, and information on a receiver to receive the dealing coin.

[0063] The transfer processing unit (313) receives dealing coin transfer request verification information transmitted from the dealing coin broker module and outputs the information on the screen. The dealing coin transfer request verification information may be, for example, information for verifying whether sender A transfers a dealing coin. Alternatively, the dealing coin transfer request verification information may be information for verifying whether receiver B requests a dealing coin transfer. When response information is inputted in response to a user input, the transfer processing unit (313) may

transmit verification response information to the dealing coin broker module.

[0064] In the case of transferring a dealing coin, the transfer processing unit (313) may, for example, receive transfer button generation control information from the dealing coin broker module, and output the information on the screen. Alternatively, when user's verification response information is inputted in response to the dealing coin transfer request verification, the transfer processing unit (313) may output a transfer button on the screen. When a transfer button press signal is inputted, the transfer processing unit (313) transmits, to the dealing coin broker module, information on a total amount of dealing coins inputted by the user and information on a receiver to receive a transfer.

[0065] In the case of receiving a transfer of a dealing coin, the transfer processing unit (313) receives an input of another owner's dealing coin information from the dealing coin broker module and stores it in the sub-account. When decryption information for another owner's dealing coin information is inputted from the dealing coin broker module, the transfer processing unit (313) connects to the dealing coin generating module (210) to thereby transmit dealing coin owner change

request information including another owner's dealing coin information and another owner's dealing coin decryption information. The transfer processing unit (313) receives an input of one's own dealing coin information and dealing coin encryption information from the dealing coin generating module (210) and stores it in the main account.

[0066] In the case of selling or transferring a dealing coin, the authentication processing unit (314) is configured to verify whether the sale or transfer is performed by a legitimate owner of the dealing coin. The authentication processing unit (314) may employ, for example, a combination of at least two authentication methods from among e-mail authentication using an e-mail address inputted by a member upon registration, mobile phone authentication, identification number authentication, i-pin authentication and bio-information authentication.

[0067]

[0068] As shown in FIG. 4, the dealing coin broker module (231) may include a transaction processing unit (2311), a transfer processing unit (2312) and an authentication processing unit (2313). The dealing coin broker module (231) is provided in an IDC, and sells, purchases or transfers a dealing coin in

communication with the database (232).

[0069] The database (232) includes data in which member information with an intention of a dealing coin transaction is stored. The member information may include member's name, birthday, terminal identification information, member number issued at the time of registration, bank account number, log-in information (ID and password), e-mail address, membership level information, etc. Such member information may be obtained from an Internet home shopping server or a financial institution that entered into a business agreement with the consent of the members. The data stored in the database (232) may also include dealing coin transaction request information, dealing coin transaction result information, dealing coin transfer request information, and dealing coin transfer result information that are transmitted from the plurality of electronic wallet modules (221, 222, 223).

[0070] The transaction processing unit (2311) receives dealing coin transaction request information for selling a dealing coin transmitted from a terminal, for example, of member A provided with a first electronic wallet module, and stores the information in the database (232) as a "transaction waiting" state. The transaction processing unit (2311) receives dealing

coin transaction request information for purchasing the dealing coin of member A which is transmitted from a terminal, for example, of member B provided with a second electronic wallet module, updates the dealing coin transaction request information to a "transaction in progress" state and stores it in the database (232), and transmits a bank account number and a payment amount to the terminal of member B.

[0071] The transaction processing unit (2311) transmits payment verification request information to the terminal of member A intended to sell the dealing coin. In response, if information indicating that a payment is not made by the terminal of member A is inputted, the transaction processing unit (2311) cancels the transaction, and updates the dealing coin transaction request information to a "transaction waiting" state and stores it. If payment verification information is inputted from the terminal of member A, the transaction processing unit (2311) requests, from the terminal of member A, the dealing coin information for selling and transmits it to the terminal of member B. If authentication success information with respect to member A intended to sell the dealing coil is inputted from the authentication processing unit (2313), the transaction processing unit (2311) transmits dealing coin decryption information to the terminal of member B who purchased the dealing

coin, and updates the dealing coin transaction request information in the "transaction in progress" state to a "transaction completed" state and stores it.

[0072] The transfer processing unit (2312) receives an input of the dealing coin transfer request information transmitted from the electronic wallet and processes a dealing coin transfer. In general, a transfer is performed in pre-consensus between a sender and a receiver of dealing coins. The dealing coin transfer request information may include, for example, a total amount of dealing coins to transfer, and information on a receiver to receive the dealing coin. Alternatively, the dealing coin transfer request information may include a total amount of dealing coins to be transferred, and information on a sender to transfer the dealing coin.

[0073] The transfer processing unit (2312) transmits dealing coin transfer request verification information to the electronic wallet module. The dealing coin transfer request verification information may be, for example, information for verifying whether sender A transfers a dealing coin. Alternatively, the dealing coin transfer request verification information may be information for verifying whether receiver B requests a dealing coin transfer. If the transfer request is verified, the transfer

processing unit (2312) may, for example, transmit transfer button generation control information to the electronic wallet module.

[0074] If the transfer request is verified, the transfer processing unit (2312) may, for example, receive an input of dealing coin information from the electronic wallet module of the sender to transfer the dealing coin, and transmits the dealing coin to the electronic wallet module of the receiver intended to receive the dealing coin.

[0075] The authentication processing unit (2313) is configured to verify whether the transfer is performed by a legitimate owner of the dealing coin. When authentication success information with respect to the sender to transfer the dealing coin is inputted from the authentication processing unit (2313), the transfer processing unit (2312) transmits dealing coin decryption information to the terminal of the receiver intended to receive the dealing coin and stores transfer result information.

[0076]

[0077] FIGS. 5 and 6 are flow charts illustrating a dealing coin

transaction process performed by the dealing coin broker module according to an exemplary embodiment of the present disclosure. FIGS. 7 and 8 are flow charts illustrating a dealing coin transfer process performed by the dealing coin broker module according to an exemplary embodiment of the present disclosure.

[0078] Referring to FIGS. 5 and 6, a dealing coin transaction process is described. Hereinafter, it is assumed that a first electronic wallet module sells a dealing coin and a second electronic wallet module purchases a dealing coin. In addition, it is assumed that a terminal of member A is a terminal provided with a first electronic wallet module and a terminal of member B is a terminal provided with a second electronic wallet module.

[0079] In S511 and S512, the dealing coin broker module (310) receives dealing coin transaction request information (for selling) transmitted from the first electronic wallet module and stores it in the database in a "transaction waiting" state.

[0080] When receiving dealing coin transaction request information for purchasing the dealing coin of the first electronic wallet module from the second electronic wallet module in S513, the dealing coin broker module (310) updates the corresponding dealing coin transaction request information to a

"transaction in progress" state and stores it in the database, and transmits a bank account number and a payment amount to the terminal of member B in S514 and S515.

[0081] The terminal of member B provided with the second electronic wallet module processes the payment via a bank transfer using the bank account number or without a bank account, or by using a credit card depending on a user input. The terminal of member A provided with the first electronic wallet module receives payment notification information transmitted from a financial server and displays it on a screen.

[0082] The dealing coin broker module (310) transmits payment verification request information to the terminal of member A intended to sell the dealing coin in S516, and in response, receives an input of payment result information from the terminal of member A in S517. If information indicating that a payment is not made from the terminal of member A upon verification of the payment result information in S518, the dealing coin broker module (310) cancels the transaction in S519, and updates the dealing coin transaction request information in a "transaction in progress" state to a "transaction waiting" state and stores it. If payment verification information is inputted from the terminal of member A, the dealing coin broker

module (310) requests, from the terminal of member A, the dealing coin information for selling and transmits it to the terminal of member B in S520.

[0083] The second electronic wallet module provided in the terminal of member B receives an input of the dealing coin information and stores it in the sub-account. For example, if the dealing coin information belongs to another owner, the second electronic wallet module may be configured to automatically store the dealing coin information in the sub-account.

[0084] Referring to FIG. 6, the dealing coin broker module (310) processes authentication of the dealing coin sale for member A intended to sell the dealing coin in S521. In S522, the dealing coin broker module (310) determines whether the authentication for member A is successful. If the authentication for member A is successful as a result of the determination, the dealing coin broker module (310) transmits dealing coin decryption information to the terminal of member B who purchased the dealing coin, and updates the dealing coin transaction request information in the "transaction in progress" state to a "transaction completed" state and stores it in S523 and S524.

[0085] When the dealing coin decryption information owned by member A is inputted from the dealing coin broker module (310), the second electronic wallet module provided in the terminal of member B connects to the dealing coin generating module (210) to thereby transmit dealing coin owner change request information including the dealing coin information and the dealing coin decryption information owned by member A. The second electronic wallet module provided in the terminal of member B receives one's own dealing coin information and dealing coin decryption information and stores it in the main account.

[0086]

[0087] Referring to FIGS. 7 and 8, a dealing coin transfer process is described. Hereinafter, it is assumed that a first electronic wallet module receives a dealing coin and a second electronic wallet module transfers a dealing coin. In addition, it is assumed that a terminal of member A is a terminal provided with a first electronic wallet module and a terminal of member B is a terminal provided with a second electronic wallet module.

[0088] In S711 and S712, the dealing coin broker module (310) receives dealing coin transfer request information transmitted from the first electronic wallet module and stores it in the

database in a "transfer waiting" state. The dealing coin transfer request verification information may be, for example, information for verifying whether sender A transfers a dealing coin.

[0089] The dealing coin broker module (310) receives verification response information from the second electronic wallet module in S713, and verifies the transfer request in S714. If the transfer request is not verified as a result of the verification, the dealing coin broker module (310) cancels the information stored in the "transaction waiting" state in the database. If the transfer request is verified as a result of the verification, the dealing coin broker module (310) transmits, for example, transfer button generation control information to the second electronic wallet module in S715. Alternatively, if the transfer request is verified, the dealing coin broker module (310) receives an input of dealing coin information for transfer from the second electronic wallet module and transmits it to the first electronic wallet module in S716.

[0090] The first electronic wallet module provided in the terminal of member A receives an input of the dealing coin information and stores it in the sub-account. For example, if the dealing coin information belongs to another owner, the first

electronic wallet module may be configured to automatically store the dealing coin information in the sub-account.

[0091] Referring to FIG. 8, the dealing coin broker module (310) processes authentication of the dealing coin sale for member B (second electronic wallet module) intended to transfer the dealing coin in S717. In S718, the dealing coin broker module (310) determines whether the authentication for member B is successful. If the authentication for member B is unsuccessful as a result of the determination, the dealing coin broker module (310) cancels the information stored in the "transfer waiting" state in the database in S719. If the authentication is successful as a result of the verification, the dealing coin broker module (310) transmits dealing coin decryption information to the terminal of member A in S720.

[0092] When the dealing coin decryption information owned by member B is inputted from the dealing coin broker module (310), the first electronic wallet module provided in the terminal of member A connects to the dealing coin generating module (210) to thereby transmit dealing coin owner change request information including the dealing coin information and the dealing coin decryption information owned by member B, receives an input of one's own dealing coin information and dealing coin

decryption information from the dealing coin generating module (210), and stores it in the main account in S721. In S722, the dealing coin broker module (310) stores transfer result information in the database.

[0093]

[0094] Although exemplary embodiments of the present disclosure have been shown and described with reference to the accompanied drawings to enable one of ordinary skill in the art to readily understand and reproduce the present disclosure, the present disclosure is not limited to the described embodiments. Instead, it would be appreciated by one of ordinary skill in the art that changes may be made to these embodiments without departing from the principles and spirit of the invention, the scope of which is defined by the claims and their equivalents.

CLAIMS

1. A security method for online transaction information conducted in a dealing coin broker module connected to a plurality of member terminals provided with an electronic wallet module via an internet network, the method comprising:

receiving, by the dealing coin broker module, dealing coin transaction request information for selling a dealing coin owned by a first member from a first member terminal provided with a first electronic wallet module, and storing the information in a database;

when the dealing coin broker module receives dealing coin transaction request information for purchasing a dealing coin from a second member terminal provided with a second electronic wallet module, transmitting a bank account number and payment amount information stored in the database to the second member terminal provided with the second electronic wallet module;

when the dealing coin broker module transmits payment verification request information to the first member terminal provided with the first electronic wallet module, and when the payment verification request information is inputted by the first member terminal in response, transmitting information on the dealing coin intended to be sold by the first member terminal to the second member terminal provided with the second

electronic wallet module;

receiving, by the second electronic wallet module, the information on the dealing coin intended to be sold by the first member terminal while being encrypted from the dealing coin broker module, and storing the encrypted information in a sub-account;

when the dealing coin broker module transmits authentication request information for verifying whether the sale is performed by a legitimate owner to the first member terminal intended to sell the dealing coin information, and receives authentication success information from the first member terminal in response, transmitting dealing coin decryption information to the second member terminal provided with the second electronic wallet module which purchased the dealing coin information;

when the dealing coin decryption information for the dealing coin information owned by the first member is inputted from the dealing coin broker module, connecting, by the second electronic wallet module, to the dealing coin broker module to thereby transmit dealing coin owner change request information including the dealing coin information owned by the first member and the dealing coin decryption information; and

receiving, by the second electronic wallet module, dealing coin information owned by the second member and dealing coin

decryption information from the dealing coin broker module, and storing the information in a main account.

2. The security method according to Claim 1, further comprising:

receiving dealing coin transfer request information for transferring a dealing coin from the first member terminal provided with the first electronic wallet module to the second member terminal provided with the second electronic wallet module, and storing the information in the database;

when the dealing coin broker module transmits verification information which verifies the dealing coin transfer request to the second member terminal provided with the second electronic wallet module and verification response information is inputted, receiving information on the dealing coin from the first member terminal provided with the first electronic wallet module, and transmitting the information on the dealing coin to the second member terminal provided with the second electronic wallet module;

receiving, by the second electronic wallet module, the information on the dealing coin transferred by the first member terminal from the dealing coin broker module, and storing the information in a sub-account;

when the dealing coin broker module transmits

authentication request information for verifying whether the transfer is performed by a legitimate owner to the first member terminal which transferred the information on the dealing coin, and receives authentication success information from the first member terminal in response, transmitting dealing coin decryption information to the second member terminal provided with the second electronic wallet module;

when the dealing coin decryption information for the dealing coin information owned by the first member is inputted from the dealing coin broker module, connecting, by the second electronic wallet module, to the dealing coin broker module to thereby transmit dealing coin owner change request information including the dealing coin information owned by the first member and the dealing coin decryption information; and

receiving, by the second electronic wallet module, dealing coin information owned by the second member and dealing coin decryption information from the dealing coin broker module, and storing the information in a main account.

3. A security system for online transaction information, the system comprising an electronic wallet module operated by a user terminal and a dealing coin broker module operated by a server connected to the user terminal via an internet network,

the electronic wallet module comprises:

a storing unit comprising a main account to store one's own dealing coin information and a sub-account to store information on a dealing coin owned by another party; and

a first transaction processing unit to generate dealing coin transaction request information for selling one's own dealing coin in response to a user input to thereby transmit the information to the dealing coin broker module, to receive payment verification request information for inquiring whether the payment is made by a buyer of the dealing coin from the dealing coin broker module to thereby display the information, to generate payment result information in response to a user input to thereby transmit the information to the dealing coin broker module, and to transmit the dealing coin information stored in the main account to the dealing coin broker module according to a request from the dealing coin broker module,

wherein the first transaction processing unit generates dealing coin transaction request information for purchasing a dealing coin owned by another party in response to a user input to thereby transmit the information to the dealing coin broker module, and when decryption information for the dealing coin owned by another party is inputted from the dealing coin broker module, the first transaction processing unit connects to a dealing coin generating module to thereby transmit dealing coin owner change request information including the information on

the dealing coin owned by another party and the decryption information for the dealing coin, and

wherein the first transaction processing unit receives one's own dealing coin information and dealing coin decryption information from the dealing coin generating module to thereby store the information in the main account.

4. The security system according to Claim 3, wherein the electronic wallet module further comprises:

a first transfer processing unit to generate dealing coin transfer request information in response to a user input to thereby transmit the information to the dealing coin broker module,

to receive verification information which verifies the dealing coin transfer request information transmitted from the dealing coin broker module to thereby display the verification information on a screen, and upon an input of response information from a user in response to the verification information which verifies the dealing coin transfer request, to display a transfer button on the screen, and

upon an input of a transfer button press signal, to transmit, to the dealing coin broker module, the information on the dealing coin intended to be transferred by the user.

5. The security system according to Claim 4, wherein the first transfer processing unit is characterized by receiving an input of information on a dealing coin owned by another party from the dealing coin broker module to thereby store the information in the sub-account,

when decryption information for the information on the dealing coin owned by another party is inputted from the dealing coin broker module, connecting to a dealing coin generating module to thereby transmit dealing coin owner change request information including the information on the dealing coin owned by another party and the decryption information for the dealing coin, and

receiving one's own dealing coin information and dealing coin decryption information from the dealing coin generating module to thereby store the information in the main account.

6. The security system according to Claim 4, wherein the electronic wallet module further comprises:

a first authentication processing unit to transmit authentication result information to the dealing coin broker module by performing user authentication upon receipt of authentication request information for verifying whether a sale or transfer is conducted by a legitimate user of dealing coin information from the dealing coin broker module.

7. The security system according to Claim 3, wherein the dealing coin broker module further comprises:

a database to store information on a member with a dealing coin transaction intention, dealing coin transaction request information transmitted from the electronic wallet module, dealing coin transaction result information, dealing coin transfer request information, or dealing coin transfer result information; and

a second transaction processing unit to receive dealing coin transaction request information for selling from the first member terminal provided with the first electronic wallet module to thereby store the information in the database, upon receipt of dealing coin transaction request information for purchasing the dealing of the first member from the second member terminal provided with the second electronic wallet module, to transmit a bank account number and payment amount information stored in the database to the second member terminal,

after the transmission of payment verification request information to the first member terminal and the inputting, by the first member terminal, of the payment verification request information in response, to transmit information on the dealing coin intended to be sold by the first member terminal to the second member terminal.

8. The security system according to Claim 7, wherein the dealing coin broker module further comprises:

a second transfer processing unit to receive dealing coin transfer request information for transferring from the first member terminal provided with the first electronic wallet module or dealing coin transfer request information for receiving a transfer from the second member terminal provided with the second electronic wallet module to thereby store the information in the database,

after the transmission of dealing coin transfer request verification information to the first member terminal provided with the first electronic wallet module or to the second member terminal provided with the second electronic wallet module and the inputting of verification response information, to receive dealing coin information from the first member terminal provided with the first electronic wallet module to thereby transmit the dealing coin information to the second member terminal provided with the second electronic wallet module.

9. The security system according to Claim 8, wherein the dealing coin broker module further comprises:

a second authentication processing unit to transmit authentication result information for verifying whether a sale

or transfer of the dealing coin information is conducted by a legitimate user to the first member terminal provided with the first electronic wallet module, and to receive authentication result information from the first member terminal,

wherein when authentication success information of the first member intended to transfer the dealing coin is inputted from the second authentication processing unit, the second authentication processing unit transmits dealing coin decryption information to the second member terminal from which the dealing coin is transferred.