DESCRIPTION

INFORMATION TERMINAL LINKING SYSTEM AND METHOD

INCORPORATION BY REFERENCE

[0001]

This application claims priority based on Japanese Patent Application No. 2011-096690, filed on April 25, 2011, the disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

[0002]

This invention relates to a technique for executing predetermined processing by linking together a plurality of information processing apparatuses (hereinafter referred to as "Information Terminal"). In particular, this invention relates to a technique for making it possible to efficiently process transactions using financial devices by linking together a portable terminal as an information terminal and an information terminal to which financial devices are connected. Note that the financial devices include a cashier, a passbook printer, an authentication device, etc. used in a financial service office.

BACKGROUND ART

[0003]

Today, it is prevalent to execute information processing for providing various services by linking together a plurality of information terminals. For example, JP-A-2005-216002 (Patent Literature 1) discloses a concentrated management system for financial devices, a concentrated management method for financial devices and a concentrated management program for financial devices, which flexibly and efficiently cope with a configuration change of a system or diversified business requirements to reduce operational cost. The gist is that the system comprises:

a flow specifying unit for specifying a business task flow corresponding to the obtained business condition information on a service office or business store;

a device information obtaining unit for obtaining the information on financial devices used according to business task flows, and also extracting the attribute information on the financial devices;

a device specifying unit for extracting the usage conditions of respective financial devices installed in the service office from a device state database, and also specifying, as a device to be used, a financial device whose usage condition is "Usable"; and

a processing command outputting unit for extracting the usage procedure associated with the device to be used, from configuration management information database, and also according to the usage procedure, transmitting to a client, customer information and business task flow information, and to a financial device, a processing command in the business task flow.

CITATION LIST

PATENT LITERATURE

[0004]

Patent Literature 1: JP-A-2005-216002

SUMMARY OF INVEVTION

TECHNICAL PROBLEM

[0005]

Patent Literature 1 aims to flexibly and efficiently cope with a configuration change of a system or diversified business requirements by managing the usage conditions of financial devices in a concentrated manner on the server side. In the case where a plurality of information terminals utilize a financial device, it is necessary to be efficiently share the financial device so that the plurality of information terminals may not conflict with each other when occupying the financial device. However, the Patent Literature 1 does not aim efficient processing of financial devices. In order to efficiently share financial devices, it is necessary to shorten the occupancy time of the financial devices. For this purpose, it is necessary to grasp the usage conditions of the financial devices according to the transaction conditions in a series of transaction processes as a whole. However, Patent Literature 1 can only grasp the usage conditions of financial devices at a time when there is a transaction (task) to be processed on the information terminal.

[0006]

The object of this invention is to provide a technique that can shorten the time of transaction using financial devices in a service office by in advance executing a part of processing associated with financial devices in a series of transaction processes according to transaction conditions.

SOLUTION TO PROBLEM

[0007]

In this invention, it is presupposed that financial devices which can be linked (i.e. physically connected) to a portable terminal are limited. And in order to cause a portable terminal to use (or to be linked to) particular devices such as financial devices, a "Device Terminal" is used to which a plurality of particular devices are connected in a concentrated way (which is preferably installed in a service office where this system is utilized). At this time, when the portable terminal performs the processing by cooperating with the device terminal, the portable terminal specifies a particular device which meets the above presupposition (i.e. restriction) and a time to cooperate with the device terminal.

[0008]

A certain series of transaction processes as a whole in the portable terminal are referred to as "Ordinary Processing"; a part of the ordinary processing associated with financial devices which can be executed in advance is referred to as "Preprocessing"; and the remaining part of the ordinary processing which has not been preprocessed is referred to as "Device Operation Processing".

[0009]

Further, a transaction being currently (or at a certain time) executed is referred to as a "Transaction Name"; and a step being currently executed during the current transaction is referred to as a "Transaction State", and the information to specify the current transaction consisting of at least the transaction name and the transaction state is referred to as a "Transaction Condition". Note that the "Transaction" in this disclosure is only an example of a process, and this invention may be applied to any type of process.

[0010]

In order to attain the above object of this invention, for an example, in the case where a financial transaction is executed, a portable terminal requests preprocessing to a plurality of device terminals according to transaction conditions in a series of transaction processes executed on a portable terminal, and decides a device terminal from among the device terminals that can accept preprocessing, so that a plurality of portable terminals can efficiently share a plurality of device terminals; and the decided device terminal performs preprocessing according to the transaction conditions. Specifically, the processing will be performed as described below.

[0011]

In an information terminal linking system comprising a portable terminal performing a series of transaction processes, a plurality of device terminals to each of which financial devices are connected, and a server, which are connected via a communication network, the portable terminal, each time a transaction step proceeds, decides, in reference to preprocessing decision information, whether it is time that it is possible to request preprocessing. If it is time that it is possible to request preprocessing, the portable terminal transmits a transaction condition to a plurality of device terminals to issue a query as to whether the preprocessing is acceptable.

[0012]

In response to a query as to whether the preprocessing is acceptable received from the portable terminal, each device terminal calculates in reference to the transaction condition decision information, the occupancy condition of the financial devices connected to the device terminal according to the transaction condition received from the portable terminal, and informs the calculation results as an acceptability condition to the portable terminal.

[0013]

The portable terminal decides, on the basis of the acceptability conditions received from respective device terminals to which financial devices are connected, a device terminal to which the greatest number of occupied financial devices are connected, as a device terminal to which a request for preprocessing is to be made. This is based on the idea that a device terminal having a high rate of occupying financial devices is preferentially decided as a device terminal to which a request for preprocessing is to be made in order to improve the usability of the device terminal. The portable terminal transmits to the decided device terminal the transaction condition and transaction data, and transmits request information for requesting preprocessing.

[0014]

The above decided device terminal receives a request for preprocessing from the portable terminal, obtains a device processing flow for performing processing associated with financial devices according to the transaction condition received from the portable terminal, and executes the device processing flow obtained as preprocessing.

[0015]

The portable terminal, each time a transaction step proceeds, decides whether it is time that it is possible to request device operation processing. If it is possible to request device operation processing (or it is possible to transmit request information) in the current transaction step, the portable terminal transmits to the above decided device terminal the transaction

condition and transaction data, and transmits request information for requesting device operation processing.

[0016]

The above decided device terminal receives from the portable terminal a request for device operation processing, obtains in reference to the transaction condition decision information, a device processing flow for performing processing associated with financial devices according to the transaction condition received from the portable terminal, and executes the device processing flow obtained as device operation processing.

[0017]

Note that when the portable terminal decides a device terminal to which a request preprocessing is to be made, the portable terminal may decides, on the basis of the acceptability conditions received from respective device terminals to which financial devices are connected, a device terminal to which the rate of occupied financial devices connected is highest, as the device terminal to which a request preprocessing is to be made.

ADVANTAGEOUS EFFECTS OF INVENTION

[0018]

In this invention, since a part of processing associated with a particular device (for example, a financial device) is executed in advance according to the processing condition in an information terminal, the time period during which the particular device is actually occupied can be shortened. Further, since the information terminal shortens the time period during which the particular device is occupied, the waiting time for the use of the particular device can be reduced.

Other objects, features and advantages of this invention will become apparent from the embodiments of this invention described herein in conjunction with the attached drawings.

BRIEF DESCRIPTION OF DRAWINGS

[0019]

Fig. 1 shows the functional configuration of an information terminal linking system according to an embodiment of this invention;

Fig. 2 shows an example of preprocessing decision information according to an embodiment of this invention;

Fig. 3 shows an example of preprocessing management information according to

an embodiment of this invention;

Fig. 4 shows an example of transaction condition decision information according to an embodiment of this invention;

Fig. 5 shows an example of occupancy condition management information according to an embodiment of this invention;

Fig. 6 shows an example of device processing flow information according to an embodiment of this invention;

Fig. 7 shows a whole processing flow in a portable terminal for executing a transaction according to an embodiment of this invention;

Fig. 8 shows a processing flow in a portable terminal and a device terminal for executing preprocessing according to an embodiment of this invention;

Fig. 9 shows a processing flow in a portable terminal for deciding a device terminal to which a request for preprocessing is to be made according to an embodiment of this invention; and

Fig. 10 shows a processing flow in a portable terminal and a device terminal for executing device operation processing according to an embodiment of this invention.

DESCRIPTION OF EMBODIMENTS

[0020]

An embodiment of this invention will be described below in reference to the attached drawings.

This embodiment uses an example of an information terminal linking system and method for, when cancelling a time deposit account in a banking office, processing in advance a part of cancellation transaction of the time deposit account by linking together a portable terminal to financial devices. However, the technical idea of this invention should not be limited to this example. Namely, it can be applied to transactions other than financial transactions, and further it can be applied to tasks such as consultation and notification other than transactions.

[0021]

Note that a "Portable Terminal" in this invention includes a portable PC (personal computer), a tablet type terminal, a slate type terminal, a smart phone, a cell phone, etc. and may be a computer (information processing device) that can execute programs for trading financial products. Also, note that a "Financial Device" refers to any type of device required for trading financial products, such as a cashier for handling the input and output of cash, a passbook printer

(passbook recorder), a passbook issuing machine, an authentication device, a scanner for reading a bank form, a magnetic /IC (integrated circuit) card reader, etc.

[0022]

In this embodiment, such a usage situation as described below is supposed. Customers visiting a banking office include not only those who do not have a definite purpose of visiting, but also those who have a vague idea that "I do not know what to do in order to buy a house in the near future", "I would like to have light conversations in the bank on what the bank can advise me", or "I would like to gather probably necessary information while visiting the banking office". A bank clerk with a portable terminal walks around in the office at their will, and goes to a visiting customer to meet and attend on the customer on site. During light communications with the visiting customer, the bank clerk listens to and gives advice to the customer, and shifts to concrete consultation and transaction. Since the area where low counters are installed and the number of counters are limited in the office, the bank clerk does not ask the customer to move, but, by using the portable terminal on site where the clerk first met the customer (for example, a nearby table in the lobby area), the bank clerk refers to the information required for the consultation and transaction, input the transaction data, etc., and proceeds to the transaction on site. The bank clerk advances a particular transaction with the customer, and when it is necessary to perform such operations on financial devices as card reading, finger vein authentication, input and output of cash, passbook recording, and bank form reading, the bank clerk moves to a nearby device terminal installed in the lobby area and operates financial devices connected to the device terminal. At this time, the bank clerk does not actually move to the installation site of the device terminal to start operating the financial devices (for example, withdrawing cash), but before moving to the installation site of the device terminal, the bank clerk causes the device terminal to execute in advance a part of processing of the financial devices. For example, the processing from counting money to be withdrawn to storing cash on stacker is executed in advance. Thereafter, when the bank clerk has reached the installation site of the device terminal, the remaining processing associated with the financial devices is executed. For example, the cash slot of the cashier is opened and the cash stored on the stacker is discharged.

[0023]

In the usage situation as described above, an example of ordinary processing is "a series of steps performed by the device terminal after the portable terminal has determined the amount of money to be withdrawn of: counting the amount of cash to be output; storing the cash on the stacker in the cashier; opening the cash slot of the cashier; and discharging the cash stored

on the stacker." At this time, an example of preprocessing is "steps performed by the device terminal after the portable terminal has determined the amount of money to be withdrawn of: counting the amount of cash to be output; and storing the cash on the stacker in the cashier." On the other hand, an example of device operation processing is "steps of: opening the cash slot of the cashier and discharging the cash stored on the stacker."

[0024]

At this time, a device terminal receives preprocessing from a plurality of portable terminals simultaneously and executes the preprocessing. Namely, in the stage of preprocessing, one or more portable terminals share a device terminal. On the other hand, when a bank clerk and a customer reach the installation site of the device terminal and the remaining device operation processing is executed, the single portable terminal occupies the device terminal.

[0025]

Fig. 1 shows the functional configuration of an information terminal linking system according to an embodiment of this invention. A plurality of portable terminals 1, a plurality of device terminals 2 and a server 3 are connected to one another via a communication network 4. The portable terminal 1 includes five functions and the device terminal includes three functions. These functions are executed by the hardware of the respective devices and the programs for controlling the hardware.

[0026]

The portable terminal 1 is provided with a touch panel 171 as an I/O (input/output) device. The touch panel may be replaced with a display, a mouse, a keyboard, etc. Further, the portable terminal 1 may be provided with a contactless IC chip 172 and a GPS (Global Positioning System) 173. The first function of the portable terminal 1 is an input function 11 to input transaction data by a bank clerk or a customer using the touch panel 171 of the portable terminal 1. The second function of the portable terminal 1 is a display function 12 to display the content of the transaction data input by the bank clerk or the customer using the touch panel 171 of the portable terminal 1, the content of the data received from the device terminal 2 or the server 3, the transaction screen received from the server 3, etc. The third function of the portable terminal 1 is a storage function 13 to manage information handled in the portable terminal 1. The storage function 13 manages preprocessing decision information 131 and preprocessing management information 132. These pieces of information are held on a memory in the portable terminal 1 or an external storage unit.

[0027]

However, these pieces of information may be previously distributed from the server 3 to the portable terminal 1, or obtained dynamically from the server 3 during system start-up or program execution. The fourth function of the portable terminal 1 is a communication function 14 to transmit/receive data to/from the device terminal 2 and the server 3. The fifth function of the portable terminal 1 is a control function 15 to execute a program for conducting a transaction and to control the above first to fourth functions and hardware 171-173.

[0028]

The device terminal 2 is provided with financial devices such as a cashier 241, a passbook printer 242, a passbook issuing machine 243, an authentication device 244, a scanner 245, an LBP (Laser Beam Printer) 246, a receipt printer 247 and an MS (Magnetic Stripe)/IC card reader 248. However, the device terminal 2 need not be provided with all of these financial devices, and it may be provided with other financial devices, or a multipurpose display device, input device, printing device, etc. Further, each device terminal 2 need not have the same configuration so as to be provided with the same financial devices, but financial devices connected to each device terminal 2 may be various. Further, the same type of two or more financial devices may be connected to a single device terminal 2. The first function of the device terminal 2 is a storage function 21 to manage information to be handled in the device terminal 2 itself. The storage function 21 manages transaction condition decision information 211, occupancy condition management information 212 and device processing flow information 213. These pieces of information are held on a memory in the device terminal 2 or on an external storage unit. However, these pieces of information may be previously distributed (delivered) from the server 3 to the device terminal 2 and held there, or obtained dynamically from the portable terminal 1 or the server 3 during system start-up or program execution. The second function of the device terminal 2 is a communication function 22 to transmit/receive data to/from the portable terminal 1 and the server 3. The third function of the device terminal 2 is a control function 23 to execute programs associated with the processing of financial devices and to control the above first and second functions and the hardware 241-248.

[0029]

The server 3 corresponds to a banking office server. According to the requests from the portable terminal 1 and the device terminal 2, the server 3 performs settlement processing, customer information reference and transaction history reference in cooperation with a host of the account system and a server of the information system.

[0030]

The communication network 4 includes a dedicated line, a wired LAN (Local

Area Network) and a wireless LAN. In particular, the communication between the portable terminal 1 and the device terminal 2 may be near field communication such as infra-red communication or contactless IC communication.

[0031]

Note that it is supposed to use portable terminals 1 which can be carried around in this invention, but that portable terminals 1 may be used with being fixed at an installation site but not carried around. Further, instead of portable terminals 1, installed PCs may be used.

[0032]

Fig. 2 shows an example of preprocessing decision information 131 according to an embodiment of this invention. The preprocessing decision information 131 is utilized to decide whether, in respective processing steps during transaction (for example, at a time when displaying respective screens in the screen transition during transaction), it is possible to make a request to a device terminal 2 for preprocessing. Transaction names 1311 represent names or types of transactions such as time deposit account opening, saving account opening, investment trust purchasing, inheritance, etc. Transaction states 1312 represent those processing steps (for example, names of a transaction screen or operation types on the transaction screen) during a transaction represented by a transaction name 1311, in which it is possible to make a request to a device terminal 2 for preprocessing. For example, the first record in Fig. 2 indicates that it is possible to make a request to a device terminal 2 for preprocessing in the processing step of determining refund in the transaction of the time deposit maturity (at a time when a customer has determined refund on a refund operation confirmation screen). Note that respective records in the preprocessing decision information 131 are previously defined and recorded.

[0033]

Fig. 3 shows an example of preprocessing management information 132 according to an embodiment of this invention. The preprocessing management information 132 is utilized to record whether a request for preprocessing has been made to the device terminal 2. A portable terminal ID 1321 represents an ID for identifying a corresponding portable terminal. A device terminal ID 1322 represents an ID for identifying the device terminal to which the request for preprocessing has been made. A receipt number 1323 represents a number which the device terminal receiving the request for preprocessing issues to manage the preprocessing. Note that the portable terminal ID 1321, the device terminal ID 1322 and the receipt number 1323 are uniquely identifiable numbers. For example, in the case where the portable terminal ID 1321 of the portable terminal is "P001", since the value of the related device terminal ID 1322 and the receipt number 1323 have not yet been determined before a request for

preprocessing is made, the values of (Portable Terminal ID, Device Terminal ID, Receipt Number) are (P001, -, -). Hereinafter, undetermined data will be represented as "-". Then, the portable terminal makes a request for preprocessing to the device terminal whose device terminal ID is "D01". And when "101" has been issued as the receipt number of the preprocessing, the values of (Portable Terminal ID, Device Terminal ID, Receipt Number) are stored in the preprocessing management information 132 as (P001, D01, 101) like the first record in Fig. 3.

[0034]

Note that in this embodiment a single portable terminal is supposed to conduct a single transaction for ease of explanation. In this case, the number of records in the preprocessing management information 132 is at most one (1), and the receipt number 1332 is not necessarily required. On the other hand, in the case where a single portable terminal conducts a plurality of transactions, the number of records in the preprocessing management information 132 may be two or more, and the receipt number 1323 is required.

[0035]

Fig. 4 shows an example of transaction condition decision information 211 according to an embodiment of this invention. The transaction condition decision information 211 is utilized to decide according to the transaction condition in a portable terminal what financial devices are to be occupied and what processing flows are to be executed. A transaction condition number 2111 represents a number for identifying each record in the transaction condition decision information 211. Note that the transaction condition number 2111 is a uniquely identifiable number. A transaction name 2112 represents a name or type of transaction. A transaction state 2113 represents a processing step during the transaction represented by the transaction name 2112 (for example, name of a transaction screen or operation type on the transaction screen). A processing type 2114 represents: (a) preprocessing is executed, (b) after executing the preprocessing, the device operation processing is executed, or (c) ordinary processing is executed, when the transaction condition of a portable terminal 1 is values of the transaction name 2112 and the transaction state 2113 in its record. In the case of (a), "Preprocessing" is indicated; in the case of (b), "Device Operation Processing" is indicated; and in the case of (c), "Ordinary Processing" is indicated. A device to be used 2115 represents a set of financial devices to be used, when the transaction condition of a portable terminal 1 is values of the transaction name 2112 and the transaction state 2113 in its record. Alternatively, in place of executing the preprocessing and the device operation processing, the ordinary processing may be executed in the case of (c). An occupancy scope 2116 represents: (a) the

whole device terminal is occupied, that is, the device terminal itself and the respective financial devices connected to the device terminal, are occupied, or (b) particular financial devices of the device terminal are occupied, when the transaction condition of a portable terminal 1 is values of the transaction name 2112 and the transaction state 2113 in its record. Specifically, in the case of (a), "Whole Terminal" is indicated while in the case of (b), a set of names of occupied financial devices are indicated. A device processing flow name 2117 represents a name of processing flow to be executed, when the transaction condition of a portable terminal 1 is values of the transaction name 2112 and the transaction state 2113 in its record. For example, the first record in Fig. 4 shows that, when the transaction condition of a portable terminal 1 is the step of determining refund in the transaction of time deposit maturity, the device terminal 2 occupies the whole terminal for preprocessing and executes a withdrawal preprocessing flow by using a cashier. Here, in the occupation of the case (a), it is possible to occupy all the respective financial devices by performing control so as to occupy the device terminal itself.

[0036]

Note that in the case where a particular financial device is described in the occupancy scope 2116, a plurality of processes can be executed in parallel, since only the financial device is occupied but the other financial devices connected to the same device terminal are not occupied. For example, since the occupancy scopes of the fourth and the seventh records in Fig. 4 do not conflict with each other, the execution of these processes of preprocessing can be continued. On the other hand, in the case where the whole terminal is described in the occupancy scope 2116, even preprocessing need occupy the whole terminal. In this case, if a certain device terminal 2 is already executing preprocessing of other financial devices, the device terminal 2 cannot accept such preprocessing from a portable terminal 1 as to require to occupy the whole terminal.

[0037]

Fig. 5 shows an example of occupancy condition management information 212 according to an embodiment of this invention. The occupancy condition management information 212 is utilized to record information on preprocessing accepted by a device terminal 2. A receipt number 2121 represents a number for identifying the preprocessing executed by the device terminal 2. A portable terminal ID 2122 represents an ID of a portable terminal whose preprocessing is accepted. A transaction state number 2123 represents a number for identifying a transaction condition whose preprocessing is accepted, and indicates the transaction condition number 2111 of the transaction condition decision information 211 shown in Fig. 4. For example, Fig. 5 shows that a single request for preprocessing is currently accepted, and that

the preprocessing whose transaction condition number 2111 of the transaction condition decision information 211 is "1" is accepted (executed) from the portable terminal 1 whose portable terminal ID is P001. Note that in the case where the device terminal 2 accepts a plurality of requests for preprocessing, a plurality of records are stored, whereas in the case where the device terminal 2 has not yet accepted no preprocessing, there are no records.

[0038]

Fig. 6 shows an example of device processing flow information according to an embodiment of this invention. The device processing flow information 213 is utilized to obtain processing flows associated with financial devices. A device processing flow name 2131 represents a name of a processing flow associated with financial devices and is referred to by the device processing flow name 2117 in the transaction condition decision information 211. Note that the device processing flow name 2131 is uniquely identifiable. A device processing flow content 2132 defines a processing flow associated with financial devices and is described by using flow charts or sequence diagrams. For example, the first record in Fig. 6 defines a processing flow content of the withdrawal preprocessing flow. When the withdrawal preprocessing flow is called for, the processing steps of opening device, registering monitor events, locking device, prohibiting deposit counting and counting withdrawal are executed in the order recited here.

[0039]

Below will be described a process flow for making a portable terminal 1 cooperating with a device terminal 2 and using financial devices, when the portable terminal 1 is used to conduct a transaction. When a program for conducting a transaction on a portable terminal 1 (hereinafter, simply referred to as transaction program) is started, the display function 12 displays a transaction screen, and displays a next transaction screen when items and buttons on the transaction screen are selected by the input function 11. Such a transaction program is executed by the control function 15, and the transaction can be completed by repeating transitions of transaction screens one after another. The transaction program may be a Web application located on the server 3 or a program installed on a portable terminal 1.

[0040]

Fig. 7 shows a whole processing flow in a portable terminal 1 for executing a transaction according to an embodiment of this invention. Note that it is assumed that the transaction program holds the name and state of a transaction executed currently (or at a certain time), on the memory of a portable terminal 1, and also that the portable terminal 1 holds on its memory a set of IDs of available device terminals installed in the banking office.

[0041]

In Step 501, a transaction screen is displayed in a series of transaction processes, and when the input into or the confirmation of the transaction screen is completed by a bank clerk or a customer, processing steps starting from Step 502 are executed. For example, when the content of a cancelled time deposit account has been confirmed and a bank clerk has pushed the acknowledge button, a transition to Step 502 occurs.

[0042]

The processing step group 55 is a set of processing steps for preprocessing, and the processing step group 56 is a set of processing steps for device operation processing or ordinary processing.

[0043]

In Step 502, it is decided at a time of this transition whether it is possible to make a request to a device terminal 2 for preprocessing. Specifically, in reference to records stored in the preprocessing decision information 141, it is decided whether there is a record coinciding with the transaction name and state currently held on the memory. If there is the record coinciding therewith, a transition to Step 503 occurs, and unless there is the record coinciding therewith, a transition to Step 504 occurs. For example, it is assumed that in the state "Determined Refund" determined due to the cancel of a time deposit account in the "Time Deposit Maturity" transaction, this step was called for. Then, since there is the record (Time Deposit Maturity, Determined Refund) in reference to the records in the preprocessing decision information 141, a transition to Step 503 occurs.

[0044]

In Step 503, information on a query is transmitted to a plurality of device terminals 2 as to whether each of the plurality of device terminals 2 can accept preprocessing, and one of the device terminals 2 which can accept preprocessing is selected to request it to execute the preprocessing. The detail of this processing will be explained later in reference to Fig. 8.

[0045]

In Step 504, it is decided at a time of this transition whether it is possible to make a request to a device terminal 2 for device operation processing or ordinary processing. Specifically, it is decided whether to request processing associated with financial devices as processing in a transaction program. If the transaction state is that the processing associated with financial devices should be requested, a transition to Step 505 occurs, and if not, a transition to Step 508 occurs. For example, in the transaction state where cash is to be discharged from

the cashier due to the cancel of a time deposit account and determined refund in the "Time Deposit Maturity" transaction, a transition to Step 505 occurs since it is necessary to execute device operation processing or ordinary processing.

[0046]

In Step 505, it is decided whether a request for preprocessing has already been made (or a request information has already been transmitted, and hereinafter the same) to a device terminal 2 in the series of transactions executed hitherto. Specifically, in reference to the records stored in the preprocessing management information 142, it is checked whether there is a record indicating that preprocessing has already been requested. If there is such a record, a transition to Step 506 occurs, and if not, a transition to Step 507 occurs. For example, if preprocessing has been requested in the processing step of "Determining Refund" in the "Time Deposit Maturity" transaction and there is such a record as shown in Fig. 3, then a transition to Step 506 occurs.

[0047]

In Step 506, since a request for preprocessing has already been made to a device terminal, the device terminal 2 is requested to execute device operation processing to complete the remaining processing. The detail of this processing will be described later in reference to Fig. 10.

[0048]

In Step 507, since a request for preprocessing has not yet been made to a device terminal, the device terminal is requested to execute ordinary processing to complete the processing. The ordinary processing carries out in a group and in succession the preprocessing described later in reference to Fig. 8 and the device operation processing described later in reference to Fig. 10.

[0049]

In Step 508, obtained is a transaction screen to be displayed next to the transaction screen of Step 501, on the basis of the results of executing the processing step group 55 or 56.

[0050]

In Step 509, if the next screen does not exist in Step 508, it is decided that the series of transaction steps have been completed, and this processing flow is finished. Otherwise, it is decided that some transaction continues, and a transition to Step 501 occurs.

[0051]

Fig. 8 shows a processing flow in a portable terminal 1 and a device terminal 2 for

executing preprocessing according to an embodiment of this invention. The processing flow in Fig. 8 is executed in Step 503 in Fig. 7.

[0052]

In Step 601, the name and state of the transaction executed by the current transaction program are obtained from the memory on the portable terminal 1. For example, the transaction name is "Time Deposit Maturity" and the transaction state is "Determined Refund".

[0053]

In Step 602, one of the device terminals 2 to which a query about a request for preprocessing having not yet been issued, is selected from among a set of device terminals 2 which are available in a banking office and held in the memory.

[0054]

In Step 603, the portable terminal 1 issues a query as to whether the device terminal 2 selected in above Step 602 can accept a request for preprocessing. At this time, the portable terminal 1 transmits to the device terminal 2 the transaction name and state obtained in Step 601, as a transaction condition.

[0055]

In Step 604, the device terminal 2 extracts a record coinciding with the transaction condition (transaction name and state) received from the portable terminal 1, from among the records stored in the transaction condition decision information 211. And it is decided whether the device terminal 2 can be occupied in the scope defined in the occupancy scope 2116 of the records. Specifically, in reference to the records stored in the occupancy condition management information 212, it is calculated whether the already occupied occupancy scope conflicts with the occupancy scope desired to be occupied for preprocessing requested by the portable terminal 1. For example, in the case where a passbook issuing machine is connected to the device terminal 2 and the passbook issuing machine has already been occupied by another preprocessing, it is decided that a new attempt to use the passbook issuing machine results in a conflict in the occupancy scope of the financial device desired to be used. Further, in the case where the occupancy scope is "Whole Terminal", if there is a record in the occupancy condition management information 212, it is decided that a conflict occurs in the occupancy scope of financial devices.

[0056]

In the case where there is no conflict in the occupancy scope in this Step, the acceptability condition is defined as the bit string data that will be described below. The bit

string data is the occupancy scope on the assumption that preprocessing has been accepted. Concerning the respective financial devices connected to the device terminal 2, (a) if it is occupied "1" is indicated, and (b) unless it is occupied "0" is indicated. For example, in the case where a cashier, a passbook issuing machine and a receipt printer are connected to the device terminal 2 and the passbook issuing machine and the receipt printer are occupied in response to the acceptance of preprocessing, the acceptability condition is the bit string "(Cashier, Passbook Issuing Machine, Receipt Printer) = (0, 1, 1)". If the occupancy scope is the whole terminal, the acceptability condition is the bit string "(Cashier, Passbook Issuing Machine, Receipt Printer) = (1, 1, 1)". On the other hand, in the case where there is a conflict between occupancy scopes in Step 604, that is, where a request for preprocessing is not acceptable, the acceptability condition is defined as "NG".

[0057]

In Step 605, the acceptability condition calculated in Step 604 is transmitted to the portable terminal 1.

[0058]

Note that in a method described above, a device terminal 2 executes Steps 604 and 605, and that in another method, each device terminal 2 simply may transmit information on currently occupied financial devices to a portable terminal 1 without calculating whether it can accept preprocessing, and the portable terminal 1 side calculates the acceptability condition.

[0059]

In Step 606, the portable terminal 1 holds on the memory the acceptability condition received from the device terminal 2. At this time, the acceptability condition is managed with the corresponding device terminal ID so as to identify a device terminal corresponding to the acceptability condition.

[0060]

In Step 607, it is decided whether there is a device terminal 2 to which any query about a request for preprocessing has not yet been issued, from among a set of device terminals held in the memory and available in the banking office. If there is a device terminal 2 to which any query has not yet been issued, a transition to Step 602 occurs, and unless there is any, a transition to Step 608 occurs.

[0061]

In Step 608, on the basis of a set of acceptability conditions received from the device terminal 2 held in Step 606, a device terminal 2 to which a request for preprocessing is to be actually made is decided.

[0062]

Fig. 9 shows a processing flow in a portable terminal 1 for deciding a device terminal to which preprocessing is to be requested according to an embodiment of this invention. The processing flow in Fig. 9 is executed in Step 608 in Fig. 8.

[0063]

In Step 651, from among a set of the acceptability conditions held in Step 606, what are not unacceptable are extracted. Namely, extracted are the acceptability conditions which have been calculated in Step 604, and they are not "NG". However, if all the acceptability conditions are "NG", the processing flow in Fig. 9 ends, and the processing flow in Fig. 8 is resumed but also ends without requesting preprocessing.

[0064]

Now, "Weight" is introduced as an index for representing the degree of occupancy of financial devices concerning the acceptability conditions of respective device terminals 2. An example of the weight will be the number of occupied financial devices connected to a device terminal 2, that is, the total number of "1" in the bit string representing the acceptability condition. For example, if an acceptability condition is (Cashier, Passbook Issuing Machine, Receipt Printer) = (0, 1, 1), then the weight is "2". The larger is the weight, the greater is the occupancy rate of financial devices connected to the device terminal 2.

[0065]

In Step 652, from among a set of the acceptability conditions extracted in Step 651, what has the greatest weight is extracted.

[0066]

In Step 653, if there are a plurality of acceptability conditions extracted in Step 652, a transition to Step 655 occurs. Otherwise (that is, there is one acceptability condition), a transition to Step 654 occurs.

[0067]

In Step 654, it is decided that a request for preprocessing is made to a device terminal 2 corresponding to the acceptability condition extracted in Step 652.

[0068]

In Step 655, one of the device terminals is selected from a set of the acceptability conditions extracted in Step 652, and the device terminal is decided as a device terminal 2 to which a request for preprocessing is to be made. At this time, in the first selection method, a device terminal 2 nearest to the portable terminal 1 is selected by using the GPS 173 of a portable terminal 1 and the positional information on the installation site of device terminals 2,

provided that it is assumed the portable terminal previously holds on its memory positional information on device terminals. In the second selection method, when the portable terminal 1 issues a query about the acceptability of preprocessing to the respective device terminals 2, a device terminal whose response time is shortest is selected, provided that it is assumed the portable terminal 1 measures the response time. In the third selection method, a bank clerk selects a device terminal from among selectable device terminals 2 displayed on the screen of the portable terminal 1. In the fourth selection method, the portable terminal 1 arbitrarily selects one of device terminals 2. Alternatively, methods other than these may be employed.

[0069]

Note that although in Step 652 a device terminal to which a request for preprocessing is to be made is extracted by using the weight, an acceptability condition of the highest "Usage Rate" may be extracted, as another method. The usage rate can be defined as the ratio of the number of occupied financial devices to the total number of financial devices connected to a device terminal 2. The usage rate can be calculated as the ratio of "1" to the bit string length representing an acceptability condition. For example, if the acceptability condition is "(Cashier, Passbook Issuing Machine, Receipt Printer, LBP) = (0, 1, 1, 0)", its usage rate is "50%".

[0070]

Further, as another method of extracting a device terminal to which a request for preprocessing is to be requested made, an acceptability condition of the highest "Priority" may be extracted. The priority is a value for an acceptability condition of a device terminal calculated using priority levels allocated to financial devices connected to each device terminal 2. This priority can be calculated by rearranging the financial devices in the descending order of priority level and by regarding the bit string representing the rearranged acceptability condition as a binary number. For example, when an acceptability condition is (Cashier, Passbook Issuing Machine, Receipt Printer, LBP) = (0, 1, 1, 0)", and when priority levels are allocated to a passbook issuing machine, a cashier, a receipt printer and a LBP in the order recited here, the priority becomes "1010" in binary number representation. Even if these acceptability conditions are the same, when priority levels are allocated to a cashier, a passbook issuing machine, a LBP and a receipt printer in the order recited here, the priority is "0101" (that is, "101") in binary number representation, and the priority of the former become higher than that of the latter.

[0071]

In Step 609, the transaction data in the transaction program currently executed on

the portable terminal 1 is obtained from the memory. For example, the transaction data are concrete data such as account numbers, money for account cancellation (withdrawal amounts), etc. The transaction data may be other than the data on the memory, and may be obtained from a storage external to a portable terminal or from a server.

[0072]

In Step 610, obtained is the device terminal ID indicating the device terminal decided in Step 608 to which a request for preprocessing is to be made, and the device terminal ID is recorded in the device terminal ID 1322 of the preprocessing management information 142. For example, such data as "(Portable Terminal ID, Device Terminal ID, Receipt Number) = (P001, D01, -)" are recorded in the preprocessing management information 142.

[0073]

In Step 611, a request for preprocessing is made to the device terminal 2 decided in Step 608 to which a request for preprocessing is to be made. At this time, the portable terminal 1 transmits the portable terminal ID, the transaction condition (transaction name and state) obtained in Step 601 and the transaction data obtained in Step 609.

[0074]

In Step 612, in reference to the records stored in the transaction condition decision information 211, the device terminal 2 extracts a record coinciding with the transaction condition (transaction name and state) received from the portable terminal 1, and obtains a transaction condition number of the record. Then, the device terminal 2 issues a new receipt number, and stores as a record in the occupancy condition management information 212 this receipt number, the portable terminal ID transmitted in Step 611, the transaction condition number obtained in this step. For example, such a record as shown in Fig. 5 is stored.

[0075]

In Step 613, the receipt number issued in Step 612 is transmitted to the portable terminal 1.

[0076]

In Step 614, the portable terminal 1 stores the received receipt number in the receipt number 1323 of the corresponding record in the preprocessing management information 142. For example, when such data as "(Portable Terminal ID, Device Terminal ID, Receipt Number) = (P001, D01, -)" are stored as a record in the preprocessing management information 142, the portable terminal 1 updates the record to "(Portable Terminal ID, Device Terminal ID, Receipt Number) = (P001, D01, 101)", if the receipt number is "101".

[0077]

In Step 615, in reference to the transaction flow information 213, the device terminal 2 obtains a processing flow to be executed as preprocessing. For example, when the transaction name and state received in Step 612 are "Time Deposit Maturity" and "Determined Refund", respectively, the first record stored in the transaction condition decision information 211 is extracted so that "Withdrawal Preprocessing Flow" to be executed as preprocessing is obtained.

[0078]

In Step 616, the processing flow obtained in Step 615 is executed.

[0079]

By executing the processing as described above, the portable terminal 1 makes a request to an appropriate device terminal 2 for preprocessing, and the device terminal 2 executes the preprocessing efficiently.

[0080]

Fig. 10 shows a processing flow in a portable terminal 1 and a device terminal 2 for executing device operation processing according to an embodiment of this invention. The processing flow in Fig. 10 is executed in Step 506 in Fig. 7.

[0081]

In Step 701, in reference to the records stored in the preprocessing management information 142, the device terminal to which a request for preprocessing has been made is specified.

[0082]

In Step 702, the transaction condition (transaction name and state) and the transaction data executed by the current transaction program are obtained from the memory on the portable terminal 1.

[0083]

In Step 703, a request for the remaining processing (device operation processing) is made to the device terminal 2 specified in Step 701. At this time, transmitted to the device terminal 2 is the receipt number stored in the corresponding record in the preprocessing management information 132 in addition to the transaction condition (transaction name and state) and the transaction data obtained in Step 702.

[0084]

In Step 704, the device terminal 2 extracts, from among the records stored in the transaction condition decision information 211, a record coinciding with the transaction condition (transaction name and state) received from the portable terminal 1. At this time, since

the device terminal 2 also receives the receipt number from the portable terminal 1, it can be decided that if there is the corresponding receipt number in the record in the occupancy condition management information 212, then device operation processing should be executed. Then, the device processing flow is obtained from the device processing flow information 213, the device processing flow being defined in the device processing flow name 2117 of the corresponding record stored in the transaction condition decision information 211. For example, in the case where "Withdrawal Preprocessing Flow" defined in the first record in Fig. 4 is executed as reprocessing, "Withdrawal Operation Processing Flow" defined in the second record in Fig, 4 is obtained in this Step.

[0085]

In Step 705, the processing flow obtained in Step 704 is executed. In Step 706, the processing results of the processing flow executed in Step 705 are transmitted to the portable terminal 1.

[0086]

In Step 707, since preprocessing and device operation processing in the device terminal 2 have now been completed, the corresponding record is deleted from the occupancy condition management information 212.

In Step 708, the portable terminal 1 receives the processing results from the device terminal 2, and deletes the corresponding record stored in the preprocessing management information 142.

[0087]

By executing the above processing, the portable terminal 1 can complete the transaction in cooperation with the device terminal 2.

[0088]

Note that in the above embodiment, an example of the preprocessing to actually operate a financial device such as a cashier is used, for example, "storing cash on stacker of cashier at a time of withdrawal operation", "previously printing a passbook at a time of issuing the passbook", etc. Other examples of preprocessing may include (a) initializing hardware and (b) initializing software. For example, the item (a) is warming up hardware. The item (b) may is (i) initializing an object (i.e. generating the object or previously substituting data into the object) utilized in a program (device processing flow) executed by a device terminal, (ii) previous obtaining finger vein data, seal reference data, etc. from a server, etc. These kinds of preprocessing can be also realized by the processing similar to the above embodiment.

The embodiments of this invention have been described above, but this invention

is never limited to the embodiments. It is apparent for a person skilled in the art that various alterations and modifications can be made within the spirit of this invention and the scope of the attached claims.

INDUSTRIAL APPLICABILITY

[0089]

This invention can be utilized as a system and a method for operating devices by using a portable terminal in fields such as finance, public service, distribution, etc.

REFERENCE SIGNS LIST

[0090]

1 Portable Terminal

2 Device Terminal

3 Server

4 Communication Network

CLAIMS

[Claim 1] An information terminal linking system comprising a portable terminal to be used for predetermined business tasks, a device terminal to which business task devices are connected to execute the processing for the business tasks, and a server, which are connected via a communication network, wherein, when the business tasks are executed,

the portable terminal transmits, according to a processing condition for the business tasks, request information including the processing condition pursuant to preprocessing decision information defining a time when the portable terminal transmits the request information, the request information being for making a request to the device terminal for a part of the processing as preprocessing; and

the device terminal receives the request information from the portable terminal and causes the business task devices to execute the preprocessing according to the processing condition.

[Claim 2] An information terminal linking system according to Claim 1, wherein

the portable terminal stores in advance preprocessing decision information indicating a time when preprocessing is to be executed; decides, in reference to the preprocessing decision information, whether it is time to request preprocessing in the processing condition; and transmits the request information if the portable terminal decides that it is time that it is possible to request the preprocessing.

[Claim 3] An information terminal linking system according to Claim 1, wherein

a plurality of device terminals are connected to the communication network;

the portable terminal transmits to each of the plurality of device terminals query information as to whether preprocessing is possible;

each of the plurality of device terminals judges, on the basis of its occupancy condition, whether processing including the preprocessing corresponding to the query information is possible, and transmits to the portable terminal an acceptability condition as the results of the judgment; and

the portable terminal decides, on the basis of the acceptability condition, from among the plurality of device terminals, a device terminal to which the request information is to be transmitted, and transmits the request information to the decided device terminal.

[Claim 4] An information terminal linking system according to Claim 2, wherein

a plurality of device terminals are connected to the communication network;

the portable terminal transmits to each of the plurality of device terminals query information as to whether preprocessing is possible;

each of the plurality of device terminals judges, on the basis of its occupancy condition, whether processing including the preprocessing corresponding to the query information is possible, and transmits to the portable terminal an acceptability condition as the results of the judgment; and

the portable terminal decides, on the basis of the acceptability condition, from among the plurality of device terminals, a device terminal to which the request information is to be transmitted, and transmits the request information to the decided device terminal.

[Claim 5] An information terminal linking system according to Claim 2, wherein

when the device terminal receives the query information, the device terminal transmits to the portable terminal an occupancy condition for business task devices connected to the device terminal, as the acceptability condition; and

when the device terminal receives the request information, the device terminal obtains device processing flows associated with business task devices corresponding to preprocessing corresponding to the request information, and then executes the device processing flows.

[Claim 6] An information terminal linking system according to Claim 3, wherein

when the device terminal receives the query information, the device terminal transmits to the portable terminal the occupancy condition for business task devices connected to the device terminal, as the acceptability condition; and

when the device terminal receives the request information, the device terminal obtains device processing flows associated with business task devices corresponding to preprocessing corresponding to the request information, and then executes the device processing flows.

[Claim 7] An information terminal linking system according to Claim 3, wherein

when the portable terminal decides a device terminal to which the request information is to be transmitted, the portable terminal decides, from among the plurality of device terminals each of which a plurality of business task devices are connected to, a device terminal to which the greatest number of occupied business task devices are connected, as the device terminal to which the request information is to be transmitted.

[Claim 8] An information terminal linking system according to Claim 5, wherein

when the portable terminal decides a device terminal to which the request information is to be transmitted, the portable terminal decides, from among the plurality of device terminals each of which a plurality of business task devices are connected to, a device terminal to which the greatest number of occupied business task devices are connected, as the

device terminal to which the request information is to be transmitted.

[Claim 9] An information terminal linking system according to Claim 3, wherein

when the portable terminal decides a device terminal to which the request information is to be transmitted, the portable terminal decides/selects, from among the plurality of device terminals each of which a plurality of business task devices are connected to, a device terminal having the highest occupied-business-task-device rate as the device terminal to which the request information is to be transmitted, the occupied-business-task-device rate being a ratio of occupied business task devices connected to a device terminal among all business task devices connected thereto.

[Claim 10] An information terminal linking system according to Claim 5, wherein

when the portable terminal decides a device terminal to which the request information is to be transmitted, the portable terminal decides/selects, from among the plurality of device terminals each of which a plurality of business task devices are connected to, a device terminal having the highest occupied-business-task-device rate as the device terminal to which the request information is to be transmitted, the occupied-business-task-device rate being a ratio of occupied business task devices connected to a device terminal among all business task devices connected thereto.

[Claim 11] An information terminal linking method using an information terminal linking system comprising a portable terminal used for predetermined business tasks, a device terminal to which business task devices are connected to execute the processing for the business tasks, and a server, which are connected via a communication network, wherein, when the business tasks are executed,

the portable terminal transmits, according to a processing condition for the business tasks, request information including the processing condition pursuant to preprocessing decision information defining a time when the portable terminal transmits the request information, the request information being for making a request to the device terminal for a part of the processing as preprocessing; and

the device terminal receives the request information from the portable terminal and causes the business task devices to execute the preprocessing according to the processing condition.

[Claim 12] An information terminal linking method according to Claim 11, wherein

the portable terminal stores in advance preprocessing decision information indicating a time when preprocessing is to be executed; decides, in reference to the preprocessing decision information, whether it is time to request preprocessing in the processing condition; and

transmits the request information if the portable terminal decides that it is time that it is possible to request the preprocessing.

[Claim 13] An information terminal linking method according to Claim 11, wherein

a plurality of device terminals are connected to the communication network;

the portable terminal transmits to each of the plurality of device terminals query information as to whether preprocessing is possible;

each of the plurality of device terminals judges, on the basis of its occupancy condition, whether processing including the preprocessing corresponding to the query information is possible, and transmits to the portable terminal an acceptability condition as the results of the judgment; and

the portable terminal decides, on the basis of the acceptability condition, from among the plurality of device terminals, a device terminal to which the request information is to be transmitted, and transmits the request information to the decided device terminal.

[Claim 14] An information terminal linking method according to Claim 12, wherein

a plurality of device terminals are connected to the communication network;

the portable terminal transmits to each of the plurality of device terminals query information as to whether preprocessing is possible;

each of the plurality of device terminals judges, on the basis of its occupancy condition, whether processing including the preprocessing corresponding to the query information is possible, and transmits to the portable terminal an acceptability condition as the results of the judgment; and

the portable terminal decides, on the basis of the acceptability condition, from among the plurality of device terminals, a device terminal to which the request information is to be transmitted, and transmits the request information to the decided device terminal.

[Claim 15] An information terminal linking method according to Claim 12, wherein

when the device terminal receives the query information, the device terminal transmits to the portable terminal an occupancy condition for business task devices connected to the device terminal, as the acceptability condition; and

when the device terminal receives the request information, the device terminal obtains device processing flows associated with business task devices corresponding to preprocessing corresponding to the request information, and then executes the device processing flows.

[Claim 16] An information terminal linking method according to Claim 13, wherein

when the device terminal receives the query information, the device terminal

transmits to the portable terminal an occupancy condition for business task devices connected to the device terminal, as the acceptability condition; and

when the device terminal receives the request information, the device terminal obtains device processing flows associated with business task devices corresponding to preprocessing corresponding to the request information, and then executes the device processing flows.

[Claim 17] An information terminal linking method according to Claim 12, wherein

when the portable terminal decides a device terminal to which the request information is to be transmitted, the portable terminal decides, from among the plurality of device terminals each of which a plurality of business task devices are connected to, a device terminal to which the greatest number of occupied business task devices are connected, as the device terminal to which the request information is to be transmitted.

[Claim 18] An information terminal linking method according to Claim 13, wherein

when the portable terminal decides a device terminal to which the request information is to be transmitted, the portable terminal decides, from among the plurality of device terminals each of which a plurality of business task devices are connected to, a device terminal to which the greatest number of occupied business task devices are connected, as the device terminal to which the request information is to be transmitted.

[Claim 19] An information terminal linking method according to Claim 12, wherein

when the portable terminal decides a device terminal to which the request information is to be transmitted, the portable terminal decides/selects, from among the plurality of device terminals each of which a plurality of business task devices are connected to, a device terminal having the highest occupied-business-task-device rate as the device terminal to which the request information is to be transmitted, the occupied-business-task-device rate being a ratio of occupied business task devices connected to a device terminal among all business task devices connected thereto.

[Claim 20] An information terminal linking method according to Claim 13, wherein

when the portable terminal decides a device terminal to which the request information is to be transmitted, the portable terminal decides/selects, from among the plurality of device terminals each of which a plurality of business task devices are connected to, a device terminal having the highest occupied-business-task-device rate as the device terminal to which the request information is to be transmitted, the occupied-business-task-device rate being a ratio of occupied business task devices connected to a device terminal among all business task devices connected thereto.