

[DESCRIPTION]

[Title of Invention] Payment Management Device, Payment Management Method, and Payment Management System

[Technical Field]

5 [0001]

The present invention relates to a payment management device, a payment management method, and a payment management system.

[Background Art]

10 [0002]

Players included in a supply chain often have various business scales and creditworthiness. Therefore, the financial strength of each of these players is different, and there is a possibility that payment and settlement operations in the supply chain will be delayed. Therefore, a conventional technique for supplying working capital to a group of companies included in the supply chain has been proposed.

[0003]

More specifically, there has been proposed a system for supplying working capital to a supply chain (see Patent Literature 1) and the like, which is a stable supply system for supplying working capital to a plurality of companies included in the supply chain from import and production of raw materials through intermediate processing to manufacture of products and to final consumers via intermediate distribution, the system comprising: means for credit rating for transactions between the entire group of companies included in the supply chain and between two specific companies; means for determining a fee determined by a funder based on the credit rating for the transaction; means for netting between the group of companies included in the supply chain and the funder; and means for automatic maintenance based on the results of credit rating.

[Citation List]

35 [Patent Literature]

[0004]

[PTL 1] Japanese Patent Application Publication No. 2005-44251

[Summary of Invention]

[Technical Problem]

5 [0005]

However, given the player hierarchy in the supply chain, there are other challenges. That is, the lower in the hierarchical structure, the later the payment execution date, and the more likely it is that the cash flow will be adversely
10 affected.

[0006]

For example, an ordering relationship is assumed in which an ordering party (buyer) places an order with a subcontracting company A (main contractor), which is a primary supplier, and
15 this subcontracting company A places an order with a subcontracting company B (sub-sub contractor), which is a secondary supplier.

[0007]

In this case, a payment site from the ordering party to
20 the primary supplier is, for example, 30 days + α (end of the following month) from the date of acceptance inspection by the ordering party, but a payment site from the primary supplier to the secondary supplier is another 30 days + α after that (end of the following month). In other words, the primary
25 supplier and the secondary supplier receive payment 30 days + α days and 60 + α days after the acceptance inspection. Therefore, the lower in the hierarchical structure, the more difficult it is to raise funds. In addition, it is not possible to control such a date of payment for the convenience
30 of the supplier.

[0008]

On the other hand, the above-mentioned suppliers are often smaller in business scale than the ordering party, and it is getting more and more difficult every year to secure
35 personnel due to the recent labor shortage. From the

standpoint of the supply chain, if it is difficult to hope for an improvement in cash flow, the funds and motivation for securing personnel for such a supply chain are likely to decline. In other words, there is a concern that the relationship between the ordering party or the like and the supplier will be weakened.

[0009]

On the other hand, from the perspective of the ordering party, it is necessary to continuously secure a reasonable number of suppliers for smooth business operations, while recognizing the above concerns. There is also a need to maintain a cash conversion cycle (CCC) as before.

[0010]

Therefore, it is an object of the present invention to provide a technique for speeding up fund collection and making cash flow appropriate regardless of the position in the hierarchical structure of the supply chain.

[0011]

A payment management device of the present invention to solve the above object, comprising: a storage device configured to store information of a credit line issued by a financial institution to a predetermined member of a supply chain as a debtor and for which convertibility to cash is ensured, information of a digital currency issued on the basis of the credit line for the predetermined member, and account information of each member of the supply chain; and a computation device configured to, when receiving a request for payment in the digital currency from a terminal of the predetermined member who is an ordering party in the supply chain to a different member who is a receiving party in the supply chain, execute a payment process in which the digital currency corresponding to the amount of payment indicated by the request for payment is separated from the digital currency of the predetermined member, of which information is held in the storage device, and distributed to a terminal of the

different member, and when receiving a request for conversion of the digital currency to cash from the terminal of the different member, execute a conversion process in which account information of the different member is specified by the storage
5 device and the amount of cash indicated by the request for conversion to cash is deposited into an account indicated by the account information from a cash account associated with the credit line.

[0012]

10 A payment management method of the present invention wherein an information processing apparatus includes a storage device that stores information of a credit line issued by a financial institution to a predetermined member of a supply chain as a debtor and for which convertibility to cash is
15 ensured, information of a digital currency issued on the basis of the credit line for the predetermined member, and account information of each member of the supply chain, the method comprising: when receiving a request for payment in the digital currency from a terminal of the predetermined member who is an
20 ordering party in the supply chain to a different member who is a receiving party in the supply chain, executing a payment process in which the digital currency corresponding to the amount of payment indicated by the request for payment is separated from the digital currency of the predetermined member,
25 of which information is held in the storage device, and distributed to a terminal of the different member; and when receiving a request for conversion of the digital currency to cash from the terminal of the different member, executing a conversion process in which account information of the
30 different member is specified by the storage device and the amount of cash indicated by the request for conversion to cash is deposited into an account indicated by the account information from a cash account associated with the credit line.

35 [0013]

A payment management system of the present invention comprising: a storage device configured to store information of a credit line issued by a financial institution to a predetermined member of a supply chain as a debtor and for which convertibility to cash is ensured, information of a digital currency issued on the basis of the credit line for the predetermined member, and account information of each member of the supply chain; and a computation device configured to, when receiving a request for payment in the digital currency from a terminal of the predetermined member who is an ordering party in the supply chain to a different member who is a receiving party in the supply chain, execute a payment process in which the digital currency corresponding to the amount of payment indicated by the request for payment is separated from the digital currency of the predetermined member, of which information is held in the storage device, and distributed to a terminal of the different member, and when receiving a request for conversion of the digital currency to cash from the terminal of the different member, execute a conversion process in which account information of the different member is specified by the storage device and the amount of cash indicated by the request for conversion to cash is deposited into an account indicated by the account information from a cash account associated with the credit line.

[Advantageous Effects of Invention]

[0014]

According to the present invention, regardless of the position in the hierarchical structure of the supply chain, it is possible to speed up the collection of funds and make the cash flow appropriate.

[Brief Description of Drawings]

[0015]

[Fig. 1] Fig. 1 is a network configuration diagram including a payment management device according to the present embodiment.

[Fig. 2] Fig. 2 is a diagram showing a hardware configuration example of the payment management device according to the present embodiment.

5 [Fig. 3] Fig. 3 is a diagram showing a data configuration example of a management DB according to the present embodiment.

[Fig. 4] Fig. 4 is a diagram showing a data configuration example of an account information DB according to the present embodiment.

10 [Fig. 5] Fig. 5 is a diagram showing a data configuration example of a history DB according to the present embodiment.

[Fig. 6] Fig. 6 is a diagram showing a data configuration example of a key information DB according to the present embodiment.

15 [Fig. 7] Fig. 7 is a diagram showing an example of a supply chain and payment management concept according to the present embodiment.

[Fig. 8] Fig. 8 is a diagram showing a flow example of a payment management method according to the present embodiment.

20 [Fig. 9] Fig. 9 is a diagram showing a screen example according to the present embodiment.

[Fig. 10] Fig. 10 is a diagram showing a screen example according to the present embodiment.

[Fig. 11] Fig. 11 is a diagram showing a screen example according to the present embodiment.

25 [Fig. 12] Fig. 12 is a diagram showing a screen example according to the present embodiment.

[Fig. 13] Fig. 13 is a diagram showing a screen example according to the present embodiment.

30 [Fig. 14] Fig. 14 is a diagram showing a screen example according to the present embodiment.

[Description of Embodiments]

[0016]

<Network Configuration>

35 Hereinafter, an embodiment of the present invention will be described in detail with reference to the drawings. Fig.

1 is a network configuration diagram including a payment management device 100 according to the present embodiment. The payment management device 100 shown in Fig. 1 is a computer device that speeds up the collection of funds and makes a cash flow appropriate regardless of the position in a hierarchical structure of a supply chain.

[0017]

The payment management device 100 of the present embodiment is coupled to a buyer system 200, a supplier system 250, and a financial institution system 300 via an appropriate network 1 so as to be capable of data communication. A group of devices coupled to the network 1 may be regarded as a payment management system 10 that implements a payment management method of the present invention in cooperation with each other.

[0018]

Among them, the buyer system 200 is a system operated by a business operator (that is, a buyer) who is an ordering party in the supply chain, and a server device that accesses an electronic commerce platform in the supply chain can be assumed, for example. This buyer is a business operator who undergoes a credit examination from a financial institution and receives a credit line for issuing digital currency.

[0019]

The digital currency issued based on this credit line will be the source of a payment process to a supplier by the buyer. On the other hand, the digital currency issued based on the credit line will later be subject to a request for conversion to cash from a receiving party and will be converted to cash. Conversion to cash is realized by depositing money from a cash account included in the credit line to the receiving party's account.

[0020]

The face value used to issue the digital currency in the credit line will be subject to lump-sum repayment from the

buyer's account to the financial institution upon the arrival of a predetermined date, that is, the conversion deadline between the financial institution and the buyer.

[0021]

5 Further, the supplier system 250 is a system operated by a business operator (that is, the supplier) who is the receiving party in the supply chain, like the buyer system 200 described above, and a server device that accesses the electronic commerce platform in the supply chain can be assumed,
10 for example.

[0022]

 The supplier will be paid in digital currency for a case ordered by the buyer described above. The digital currency is backed up by the buyer's credit line mentioned above, and is
15 treated synonymously with the funds borrowed by the buyer from a financial institution. In other words, the digital currency is a suitable settlement fund that can be converted to cash under transaction conditions agreed upon between the buyer (who is stronger than the supplier) and the financial
20 institution, regardless of the business scale and creditworthiness of the supplier.

[0023]

 Further, the financial institution system 300 is a system operated by the financial institution having the authority to
25 issue the digital currency, which is effective only in the supply chain, for example. This financial institution is a business operator that conducts a credit examination on the buyer and sets a credit line according to its creditworthiness and the like.

30 [0024]

 The credit line in this case includes a digital currency account and a cash account. The buyer can be issued the digital currency up to the credit line limit. The cash account is used when depositing cash corresponding to the amount of
35 the target digital currency into the receiving party's account

when receiving a request for conversion to cash from the receiving party (who receives an order from the ordering party and gets paid in digital currency) by the conversion deadline.
[0025]

5 In the present embodiment, the following description will be given assuming that the payment management device 100 receives a request from the buyer system 200 or the supplier system 250, or autonomously acts as an agent or mediator for the processing such as digital currency issuance and cash
10 conversion, which is carried out by the financial institution system 300. For example, each function in the financial institution system 300 is provided to the buyer system 200 and the supplier system 250 through an API of the payment management device 100.

15 <Hardware configuration>

A hardware configuration of the payment management device 100 of the present embodiment is as shown in Fig. 2. More specifically, the payment management device 100 includes a storage device 101, a memory 103, a computation device 104,
20 and a communication device 105.

[0026]

Among these devices, the storage device 101 includes an appropriate non-volatile storage element such as a solid state drive (SSD) or a hard disk drive.

25 [0027]

The memory 103 includes a volatile storage element such as a RAM.

[0028]

The computation device 104 is a CPU that executes a
30 program 102 held in the storage device 101 by reading the program into the memory 103 or the like, performs integrated control of the device itself, and performs various determination, computation, and control processes.

[0029]

35 The communication device 105 is a network interface card

that is coupled to the network 1 and is responsible for communication processing with other devices such as the buyer system 200, the supplier system 250, and the financial institution system 300.

5 [0030]

Note that the payment management device 100 may also include an input device such as a keyboard, a mouse, or a microphone that receives a key input or voice input from a user, and an output device such as a display and a speaker
10 that displays data processed by the computation device 104.

[0031]

The storage device 101 stores at least a management DB 125, an account information DB 126, a history DB 127, and a key information DB 128, in addition to the program 102 for
15 implementing necessary functions of the payment management device 100 of the present embodiment. Data structures and the like in these databases will be described in detail later.

<Data Structure Example>

Next, tables used by the payment management device 100 of the
20 present embodiment will be described. Fig. 3 shows an example of the management DB 125 according to the present embodiment. This management DB 125 is a database that stores information of a credit line issued by a financial institution to a buyer and information of a digital currency issued on the basis of
25 the credit line for the buyer.

[0032]

The data structure is a collection of records including data such as the amount of credit line set by the financial institution, credit line balance, cash conversion deadline,
30 conversion fee, and digital currency issuance amount, using a user ID that uniquely identifies a member as a key.

[0033]

Fig. 4 shows an example of the account information DB 126 according to the present embodiment. The account
35 information DB 126 is a database that stores account

information of each member of the supply chain, that is, buyers and suppliers.

[0034]

5 The data structure is a collection of records including data such as a branch code, an account type, and an account number, using the user ID that uniquely identifies the member as the key.

[0035]

10 Fig. 5 shows an example of the history DB 127 according to the present embodiment. The history DB 127 is a database that stores a payment history including information of the amount of payment in digital currency from the buyer to the supplier and a conversion history including information of a conversion process regarding the supplier who has received
15 such payment in digital currency.

[0036]

The data structure is a collection of records including data such as the dates of payment process and conversion process, a credit line setting source (buyer) that is the
20 origin of the digital currency used for such processes, a user ID of the digital currency holder in the processes, process content, a user ID of a person to be processed, and an amount to be processed.

[0037]

25 Fig. 6 shows an example of the key information DB 128 according to the present embodiment. The key information DB 128 is a database that stores key information of each member in the supply chain. The data structure is a collection of records including a public key and a private key of the member,
30 using the user ID that uniquely identifies the member in the supply chain as the key.

<Flow Example>

Hereinafter, the actual procedure of the payment management method according to the present embodiment will be
35 described with reference to the drawings. Various operations

corresponding to the payment management method described below are realized by a program read into the memory or the like and executed by the payment management device 100. The program includes codes for performing various operations described below.

[0038]

Fig. 7 is a diagram showing an example of the supply chain and the payment management concept according to the present embodiment. Fig. 8 is a diagram showing a flow example of the payment management method according to the present embodiment. Here, it is assumed, as an example, that in the supply chain illustrated in Fig. 7, a bank as a financial institution sets a credit line (for example, 15 million yen) for a buyer, and the buyer receives digital currency (for example, 10 million yen) issued based on the credit line to use as a source of payment (for example, 10 million yen) to a primary supplier in the supply chain.

[0039]

It is also assumed that the primary supplier uses a required amount (for example, 5 million yen) of the digital currency (for example, 10 million yen), which is obtained from the payment by the buyer, to a secondary supplier who places an order as a payment resource. Further, it is assumed that the secondary supplier uses, as a payment resource, cash obtained by converting a required amount (for example, 2 million yen) of the digital currency (for example, 5 million yen) of its own to an ordering party ("non-SC company" in Fig. 7) outside the supply chain.

[0040]

As already described, the following description will be given assuming that the payment management device 100 receives a request from the buyer system 200 or the supplier system 250 or autonomously acts as an agent or mediator for the processing such as digital currency issuance and cash conversion, which is carried out by the financial institution system 300. For

example, each function of the financial institution system 300 is provided to the buyer system 200 and the supplier system 250 through the API of the payment management device 100. Therefore, description will be given assuming that various kinds of processing by the financial institution system 300 are mainly performed by the payment management device 100.

[0041]

Here, it is assumed that the payment management device 100 receives a request for issuance of a predetermined amount of digital currency, based on a credit line set for the buyer described above, from the buyer system 200 of the buyer (s10). In this event, it is assumed that the buyer system 200 displays a digital currency issuance request screen (Fig. 9) on a terminal or the like operated by the buyer and receives the specified amount of issuance.

[0042]

Then, the payment management device 100 generates the amount of digital currency based on a desired issuance amount indicated by the request for issuance, and distributes the digital currency to the buyer system 200 (s11).

[0043]

In this event, the payment management device 100 reduces the credit line balance of the buyer according to the digital currency issuance amount and stores information of the generated digital currency in the management DB 125 in the storage device 101.

[0044]

When distributing the digital currency generated in response to the request for issuance to the buyer system 200, it is preferable that the payment management device 100 specifies a public key of the buyer in the key information DB 128 and uses this public key to encrypt at least information of the amount of digital currency. In this case, the payment management device 100 can also perform an operation such as inquiring to the buyer system 200 (Fig. 10) and performing

processing regarding the necessity of encrypting the amount information.

[0045]

When managing a series of processes associated with
5 payment management with a distributed ledger technology, even
if transactions exchanged between such systems as the financial
institution system 300, the buyer system 200, and the supplier
system 250 and a distributed ledger to store the transactions
after a consensus is built can be viewed by stakeholders of a
10 distributed ledger system (in this case, players in the supply
chain), at least the amount information can be known only to
the parties concerned and the financial institution. The
financial institution needs the amount information for a
conversion process of the digital currency and audit work
15 related to each transaction.

[0046]

Subsequently, the payment management device 100 receives
a request for payment in digital currency to the primary
supplier described above from the buyer system 200 (s12). It
20 is assumed that the buyer system 200 in this event makes the
request for payment upon receipt of a notification of the
completion of an ordering operation from the supplier system
250 as the primary supplier.

[0047]

25 In this case, the payment management device 100 refers
to the information about the buyer in the management DB 125 of
the storage device 101, and executes a payment process in which
the digital currency corresponding to the amount of payment
indicated by the request for payment is separated from the
30 digital currency held by the buyer and the digital currency
corresponding to the amount of payment is distributed to the
supplier system 250 as the primary supplier (s13).

[0048]

In this event, the payment management device 100 reduces
35 the amount of digital currency of the buyer according to the

target amount of the payment process in the management DB 125 in the storage device 101. The payment management device 100 also generates and registers a record regarding the content of the payment process in the history DB 127 of the storage device 101.

[0049]

During the payment process, it is preferable that, when distributing the digital currency to the supplier system 250 as the primary supplier, the payment management device 100 specifies a public key of the primary supplier in the key information DB 128 and uses this public key to encrypt at least information of the amount of digital currency. In this case, the payment management device 100 can also perform an operation such as inquiring to the supplier system 250 as the primary supplier (Fig. 11) and performing processing regarding the necessity of encrypting the amount information.

[0050]

As for the separation and distribution of the digital currency, the same handling as that of the conventional technology regarding the existing crypto-assets and electronic money may be appropriately adopted.

[0051]

Subsequently, it is assumed that the payment management device 100 receives a request for payment in digital currency to the secondary supplier from the supplier system 250 as the primary supplier (s14). It is assumed that the supplier system 250 as the primary supplier in this event has made the request for payment upon receipt of a notification of the completion of the ordering operation from the supplier system 250 as the secondary supplier.

[0052]

In this case, the payment management device 100 refers to the information about the primary supplier in the management DB 125 of the storage device 101, and executes a payment process in which the digital currency corresponding to the

amount of payment indicated by the request for payment is separated from the digital currency held by the primary supplier, and then the digital currency corresponding to the amount of payment is distributed to the supplier system 250 as the secondary supplier (s15).

[0053]

In this event, the payment management device 100 reduces the amount of digital currency of the primary supplier according to the target amount of payment process in the management DB 125 in the storage device 101. The payment management device 100 also generates and registers a record regarding the content of the payment process in the history DB 127 of the storage device 101.

[0054]

During the payment process, it is preferable that, when distributing the digital currency to the supplier system 250 as the secondary supplier, the payment management device 100 specifies a public key of the secondary supplier in the key information DB 128 and uses this public key to encrypt at least information of the amount of digital currency. In this case, the payment management device 100 can also perform an operation such as inquiring to the supplier system 250 as the secondary supplier (Fig. 12) and performing processing regarding the necessity of encrypting the amount information.

[0055]

Subsequently, the payment management device 100 receives a request for conversion to cash from the supplier system 250 as the secondary supplier, for example, for the digital currency as the target of the payment process in s15, that is, the digital currency obtained by the secondary supplier (s16).

[0056]

As for receiving such a request for conversion to cash, it is assumed that the payment management device 100 is accessed by the supplier system 250 as the secondary supplier to distribute information of a conversion fee for each digital

currency currently held by the secondary supplier (Fig. 13) and the target of the request for conversion to cash is specified (Fig. 14). The conversion fee also includes a discount for early conversion before the cash conversion deadline, and the supplier in the present embodiment achieves the buyer's creditworthiness (rather than the creditworthiness of the supplier holding the digital currency) during conversion. In that case, the supplier will be able to perform conversion, that is, conversion to cash, with a fee that would not otherwise be applicable, and the fee is reduced compared to the conventional technology.

[0057]

In this case, the payment management device 100 specifies the information of each unconverted digital currency currently held by the secondary supplier based on a payment history and a conversion history related to the secondary supplier in the history DB 127.

[0058]

This specification process corresponds to a process of calculating a difference by executing a process in which the target amount indicated by a record in which the "process content" is "payment" and "process target" is the secondary supplier, among records each having the date of process in a certain period (period before the conversion deadline such as the nearest one month), is counted to calculate the amount of digital currency acquired by the secondary supplier during the period, and a process in which the target amount indicated by a record in which the "process content" is "conversion" and the "digital currency holder" is the secondary supplier, among records each having the date of process in the same period, is counted to calculate the amount of digital currency converted to cash by the secondary supplier during the period, and the difference.

[0059]

The payment management device 100 specifies the

information of the unconverted digital currency as described above for each issuer of the digital currency, that is, for each buyer. In this case, the specification may be executed for each "credit line setting source", that is, for each buyer among the records in the history DB 127.

[0060]

Then, the payment management device 100 specifies the account information of the secondary supplier in the account information DB 126 based on the request for conversion to cash received from the supplier system 250 as the secondary supplier, and executes a conversion process in which the amount of cash indicated by the request for conversion to cash is deposited into the account of the secondary supplier from the cash account associated with the credit line of the buyer (s17). Thus, the processing is completed.

[0061]

In addition to the case of receiving the request for conversion to cash and executing the conversion process as described above, the payment management device 100 may also use a calendar function (generally provided in the computer device) to know the arrival of the cash conversion deadline for the digital currency. In that case, the payment management device 100 may specify a person who has not completed the conversion process and the amount thereof in the history DB 127, specify the account information of that person in the account information DB 126, and deposit the amount of cash corresponding to the uncompleted conversion process into the target's account from the cash account associated with the credit line in the same manner as described above.

[0062]

Alternatively, upon receipt of a notification of completion of the ordering operation from the supplier system 250 as the primary supplier or the secondary supplier who is the receiving party, the conversion process described above may be automatically performed for the digital currency paid

to the suppliers for the ordering operation.

[0063]

Although the best mode for carrying out the present invention has been specifically described above, the present
5 invention is not limited thereto, and various changes can be made without departing from the scope of the invention.

[0064]

According to the present embodiment, regardless of the position in the hierarchical structure of the supply chain, it
10 is possible to speed up the collection of funds and make the cash flow appropriate.

[0065]

At least the following will become clear from the description of the specification. That is, the payment
15 management device according to the present embodiment, wherein, when receiving a request for issuance of a predetermined amount of digital currency based on the credit line from the terminal of the predetermined member who is the ordering party in the supply chain, the computation device may be configured to
20 further execute a process in which the predetermined amount of digital currency is generated and distributed to the terminal of the predetermined member, and reduction of the credit line according to the amount and information of the generated digital currency are stored in the storage device.

25 [0066]

According to the present embodiment, it is possible to efficiently issue digital currency in response to a request from the ordering party, and to update information such as the credit line of the ordering party and the balance of digital
30 currency according to the information. This leads to more efficient payment management. As a result, regardless of the position in the hierarchical structure of the supply chain, it is possible to speed up the collection of funds and make the cash flow more appropriate.

35 [0067]

With the payment management device according to the present embodiment, wherein the computation device may be configured to further execute a process in which, during the payment process, a payment history including each information of the member subject to the payment process in the digital currency and the amount of payment is stored in the storage device, and a process in which, during the conversion process, a conversion history including each information of the member subject to the conversion process and the amount of the deposit is stored in the storage device, and a process in which, upon arrival of the predetermined cash conversion deadline for the digital currency, among the members subject to the payment process in the digital currency, the person for which the conversion process has not been completed and the amount thereof are specified by collating the payment history and the conversion history in the storage device, account information of the specified person is specified by the storage device, and the amount of cash whose conversion process has not been completed is deposited into an account indicated by the account information from the cash account associated with the credit line.

[0068]

According to the present embodiment, for receiving parties who wish to focus on their business operations, the work for converting the digital currency to cash is reduced, making it easier to appropriately maintain the business efficiency. Moreover, delays in fund collection due to forgetting to request for conversion to cash can be effectively avoided. If the conversion fee disappears with the arrival of the cash conversion deadline, the conversion to cash will be automatically executed with the lowest fee, thus achieving an appropriate fund recovery rate. Thus, regardless of the position in the hierarchical structure of the supply chain, it is possible to speed up the collection of funds and make the cash flow more appropriate.

[0069]

With the payment management device according to the present embodiment, wherein the storage device may be configured to further hold information of a fee for conversion of the digital currency according to a result of a credit examination on the predetermined member by the financial institution, as information of the credit line and information of the digital currency, and the computation device may be configured to further execute a process in which information of each unconverted digital currency currently held by the different member is specified based on the payment history and the conversion history in the storage device and information of the conversion fee for the specified each digital currency is extracted from the storage device, and a process in which the information of conversion fee is distributed to the terminal of the different member.

[0070]

According to the present embodiment, it is made easier for the receiving party who needs to seriously consider and carry out cash flow operations to consider when to convert each digital currency received in the payment process of each case to cash. Thus, the accuracy of cash flow operations is likely to be improved. This leads to the accurate determination of the appropriate timing of fund collection from the viewpoint of controlling the cost (conversion fee) associated with fund collection. As a result, regardless of the position in the hierarchical structure of the supply chain, it is possible to speed up the collection of funds and make the cash flow more appropriate.

[0071]

With the payment management device according to the present embodiment, wherein, when receiving a request for conversion to cash having the conversion target specified among the digital currencies indicated by the information of the conversion fee from the terminal of the different member, to

which the information of the conversion fee has been distributed, the computation device may be configured to execute the conversion process.

[0072]

5 According to the present embodiment, in response to the request for conversion to cash from the receiving party who needs to seriously consider and carry out the cash flow operations, the conversion process is promptly executed, which may lead to the improvement in the cash flow of the receiving
10 party. As a result, regardless of the position in the hierarchical structure of the supply chain, it is possible to speed up the collection of funds and make the cash flow more appropriate.

[0073]

15 With the payment management device according to the present embodiment, wherein, when receiving a notification of completion of an order receiving operation from the terminal of the different member who is the receiving party, the computation device may be configured to automatically execute
20 the conversion process on the digital currency paid to the different member for the order receiving operation.

[0074]

 According to the present embodiment, for the receiving party who wishes to focus on their business operations, the
25 work for converting the digital currency to cash is reduced, making it easier to appropriately maintain the business efficiency. Moreover, delays in fund collection due to forgetting to request for conversion to cash can be effectively avoided. As a result, regardless of the position in the
30 hierarchical structure of the supply chain, it is possible to speed up the collection of funds and make the cash flow more appropriate.

[0075]

 With the payment management device according to the
35 present embodiment, wherein, during the payment process, when

distributing the digital currency from the terminal of the predetermined member to the terminal of the different member, the computation device may be configured to further execute a process of encrypting at least amount information of the digital currency using a public key of the different member.

[0076]

According to the present embodiment, when issuing the digital currency from the ordering party to the receiving party as the payment process, it is possible to realize a state in the supply chain where only the ordering party can know the amount of payment with his/her own private key. This will reduce the technical and psychological obstacles related to the introduction of this payment management technology for business operators who want to maintain the confidentiality of transactions and the like, leading to widespread introduction in various places. As a result, regardless of the position in the hierarchical structure of the supply chain, it is possible to speed up the collection of funds and make the cash flow more appropriate.

[0077]

With the payment management device according to the present embodiment, wherein, when distributing a digital currency generated in response to the request of issuance to the terminal of the predetermined member, the computation device may be configured to further execute a process of encrypting at least amount information of the digital currency using a public key of the predetermined member.

[0078]

According to the present embodiment, when issuing the digital currency based on the credit line set for the ordering party by the financial institution, it is possible to realize a state where only the ordering party in the supply chain can know the amount of issuance with his/her own private key. This will reduce the technical and psychological obstacles related to the introduction of this payment management technology for

business operators who want to maintain the confidentiality of transactions and the like, leading to widespread introduction in various places. As a result, regardless of the position in the hierarchical structure of the supply chain, it is possible
 5 to speed up the collection of funds and make the cash flow more appropriate.

[Reference Signs List]

[0079]

- 1 network
- 10 10 payment management system
- 100 payment management device
- 101 storage device
- 102 program
- 103 memory
- 15 104 computation device
- 105 communication device
- 125 management DB
- 126 account information DB
- 127 history DB
- 20 128 key information DB
- 200 buyer system
- 250 supplier system
- 300 financial institution system

[CLAIMS]

[Claim 1]

A payment management device comprising:

5 a storage device configured to store information of a credit line issued by a financial institution to a predetermined member of a supply chain as a debtor and for which convertibility to cash is ensured, information of a digital currency issued on the basis of the credit line for the predetermined member, and account information of each member of the supply chain; and

10 a computation device configured to, when receiving a request for payment in the digital currency from a terminal of the predetermined member who is an ordering party in the supply chain to a different member who is a receiving party in the supply chain, execute a payment process in which the digital currency corresponding to the amount of payment indicated by the request for payment is separated from the digital currency of the predetermined member, of which information is held in the storage device, and distributed to a terminal of the different member, and when receiving a request for conversion of the digital currency to cash from the terminal of the different member, execute a conversion process in which account information of the different member is specified by the storage device and the amount of cash indicated by the request for conversion to cash is deposited into an account indicated by the account information from a cash account associated with the credit line.

[Claim 2]

30 The payment management device according to claim 1, wherein,

when receiving a request for issuance of a predetermined amount of digital currency based on the credit line from the terminal of the predetermined member who is the ordering party in the supply chain, the computation device is configured to further execute a process in which the predetermined amount of

digital currency is generated and distributed to the terminal of the predetermined member, and reduction of the credit line according to the amount and information of the generated digital currency are stored in the storage device.

5 [Claim 3]

The payment management device according to claim 1, wherein

the computation device is configured to further execute a process in which, during the payment process, a payment
10 history including each information of the member subject to the payment process in the digital currency and the amount of payment is stored in the storage device, and a process in which, during the conversion process, a conversion history including each information of the member subject to the conversion
15 process and the amount of the deposit is stored in the storage device, and

a process in which, upon arrival of the predetermined cash conversion deadline for the digital currency, among the members subject to the payment process in the digital currency,
20 the person for which the conversion process has not been completed and the amount thereof are specified by collating the payment history and the conversion history in the storage device, account information of the specified person is specified by the storage device, and the amount of cash whose
25 conversion process has not been completed is deposited into an account indicated by the account information from the cash account associated with the credit line.

[Claim 4]

The payment management device according to claim 3,
30 wherein

the storage device is configured to further hold information of a fee for conversion of the digital currency according to a result of a credit examination on the predetermined member by the financial institution, as
35 information of the credit line and information of the digital

currency, and

the computation device is configured to further execute a process in which information of each unconverted digital currency currently held by the different member is specified based on the payment history and the conversion history in the storage device and information of the conversion fee for the specified each digital currency is extracted from the storage device, and a process in which the information of conversion fee is distributed to the terminal of the different member.

10 [Claim 5]

The payment management device according to claim 4, wherein,

when receiving a request for conversion to cash having the conversion target specified among the digital currencies indicated by the information of the conversion fee from the terminal of the different member, to which the information of the conversion fee has been distributed, the computation device is configured to execute the conversion process.

[Claim 6]

20 The payment management device according to claim 1, wherein,

when receiving a notification of completion of an order receiving operation from the terminal of the different member who is the receiving party, the computation device is configured to automatically execute the conversion process on the digital currency paid to the different member for the order receiving operation.

[Claim 7]

30 The payment management device according to claim 1, wherein,

during the payment process, when distributing the digital currency from the terminal of the predetermined member to the terminal of the different member, the computation device is configured to further execute a process of encrypting at least amount information of the digital currency using a public

key of the different member.

[Claim 8]

The payment management device according to claim 2, wherein,

5 when distributing a digital currency generated in response to the request of issuance to the terminal of the predetermined member, the computation device is configured to further execute a process of encrypting at least amount information of the digital currency using a public key of the
10 predetermined member.

[Claim 9]

A payment management method wherein
an information processing apparatus includes
a storage device that stores information of a credit
15 line issued by a financial institution to a predetermined member of a supply chain as a debtor and for which convertibility to cash is ensured, information of a digital currency issued on the basis of the credit line for the predetermined member, and account information of each member
20 of the supply chain,

the method comprising:

when receiving a request for payment in the digital currency from a terminal of the predetermined member who is an ordering party in the supply chain to a different member who
25 is a receiving party in the supply chain, executing a payment process in which the digital currency corresponding to the amount of payment indicated by the request for payment is separated from the digital currency of the predetermined member, of which information is held in the storage device, and
30 distributed to a terminal of the different member; and

when receiving a request for conversion of the digital currency to cash from the terminal of the different member, executing a conversion process in which account information of the different member is specified by the storage device and
35 the amount of cash indicated by the request for conversion to

cash is deposited into an account indicated by the account information from a cash account associated with the credit line.

[Claim 10]

5 A payment management system comprising:

 a storage device configured to store information of a credit line issued by a financial institution to a predetermined member of a supply chain as a debtor and for which convertibility to cash is ensured, information of a digital currency issued on the basis of the credit line for the predetermined member, and account information of each member of the supply chain; and

 a computation device configured to, when receiving a request for payment in the digital currency from a terminal of the predetermined member who is an ordering party in the supply chain to a different member who is a receiving party in the supply chain, execute a payment process in which the digital currency corresponding to the amount of payment indicated by the request for payment is separated from the digital currency of the predetermined member, of which information is held in the storage device, and distributed to a terminal of the different member, and when receiving a request for conversion of the digital currency to cash from the terminal of the different member, execute a conversion process in which account information of the different member is specified by the storage device and the amount of cash indicated by the request for conversion to cash is deposited into an account indicated by the account information from a cash account associated with the credit line.

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