PAYMENT PLATFORM SERVER AND PAYMENT TRANSACTION PROCESSING METHOD

TECHNICAL FIELD

[0001] The present disclosure relates to the payment transaction processing. In particular, the present disclosure relates to payment transaction processing platforms which allow payments to be made using payment cards to entities which may not have provision to process and accept payment card transactions.

BACKGROUND

[0002] The recent growth in electronic commerce has resulted in an increasing number of small businesses which may transact online. Often such small businesses do not have the provision to accept and process payment card payments. Payment processing services may provide a “merchant of record” service which allows customers of a business to make payments to the payment processing service by payment card and the payment processing service then makes a payment through another channel to the business itself. This “merchant of record” service therefore allows the business to accept payments by payment card.

SUMMARY

[0003] In accordance with a first aspect of the present invention, a payment platform system for processing payment transactions is provided. The payment platform system comprising: a processor, and a data storage device, data storage device storing computer program instructions operable to cause the processor to: receive, from a payer, a payment initiation request for a payment from the payer to a payee, the payment initiation request comprising an indication of the payee and an indication of a payment amount; receive an indication of a payment card associated with the payer; determine if the payee accepts payment card payments; if the payee accepts payment card payments, initiate a payment card transaction from the payment card associated with the payer to an account associated with the payee; and if the payee does not accept payment card payments initiate a payment card transaction from the payment card associated with the payer to an account associated with the payment platform and initiate a fund transfer for the payment amount from an account associated with the payment platform to an account associated with the payee.

[0004] In an embodiment, the data storage device stores instructions operable to cause the processor to determine if the payee accepts payment card payments by accessing an application programming interface.

[0005] In an embodiment, the data storage device stores instructions operable to cause the processor to determine if the payee accepts payment card payments by comparing a company name associated with the payee with a database of payment card transaction receiving entities.

[0006] In an embodiment, the payment card associated with the payer is a virtual payment card number.

[0007] In an embodiment, the data storage device stores instructions operable to cause the processor to request a virtual payment card number in response to receiving the payment initiation request.

[0008] In an embodiment, the payment initiation request comprises the indication of the payment card associated with the payer.

[0009] In an embodiment, the payment initiation request comprises an invoice and the invoice comprises the indication of the payee and the indication of the payment amount.

[0010] According to a second aspect of the present disclosure, a payment transaction processing method in a payment platform server is provided. The method comprises: receiving, from a payer, a payment initiation request for a payment from the payer to a payee, the payment initiation request comprising an indication of the payee and an indication of a payment amount; receiving an indication of a payment card associated with the payer; determining that the payee accepts payment card payments; and initiating a payment card transaction from the payment card associated with the payer to an account associated with the payee.

[0011] According to a third aspect of the present disclosure, a payment transaction processing method in a payment platform server is provided. The method comprises: receiving, from a payer, a payment initiation request for a payment from the payer to a payee, the payment initiation request comprising an indication of the payee and an indication of a payment amount; receiving an indication of a payment card associated with the payer; determining that the payee does not accept payment card payments; initiating a payment card transaction from the payment card associated with the payer to an account associated with the payment platform; and initiating a fund transfer for the payment amount from an account associated with the payment platform to an account associated with the payee.

[0012] In an embodiment, determining that the payee does or does not accept payment card payments comprises accessing an application programming interface.

[0013] In an embodiment, determining that the payee does or does not accept payment card payments comprises comparing a company name associated with the payee with a database of payment card transaction receiving entities.

[0014] In an embodiment, the payment card associated with the payer is a virtual payment card number.

[0015] In an embodiment, the method further comprises requesting a virtual payment card number in response to receiving the payment initiation request.

[0016] In an embodiment, the payment initiation request comprises the indication of the payment card associated with the payer.

[0017] In an embodiment, the payment initiation request comprises an invoice and the invoice comprises the indication of the payee and the indication of the payment amount.

[0018] Embodiments of the invention may be provided as a network of communicating devices (i.e. a "computerized network"). Embodiments of the invention may be also provided as a software application downloadable into a computer device to facilitate the method. The software application may be a computer program product, which may be stored on a non-transitory computer-readable medium on a tangible data-storage device (such as a storage device of a server, or one within a user device).

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] In the following, embodiments of the present invention will be described as non-limiting examples with reference to the accompanying drawings in which:

FIG.1 is a block diagram showing a payment transaction processing system according to an embodiment of the present invention;

FIG.2 is a block diagram showing functional modules of a payment platform server according to an embodiment of the present invention;

FIG.3A to FIG.3C are flow diagrams showing transaction processing methods according to embodiments of the present invention;

FIG.4A and FIG.4B are message flow diagrams showing initial steps of transaction processing methods according to embodiments of the present invention; and

FIG.5 is a block diagram showing a technical architecture of a payment platform server according to an embodiment of the present invention.

DETAILED DESCRIPTION

[0020] As used herein, the term “payment card” refers to any cashless payment device associated with a payment account, such as a credit card, a debit card, a prepaid card, a charge card, a membership card, a promotional card, a frequent flyer card, an identification card, a prepaid card, a gift card, and/or any other device that may hold payment account information, such as mobile phones, Smartphones, personal digital assistants (PDAs), key fobs, transponder devices, NFC-enabled devices, and/or computers. In addition, the “payment card” may exist as application-based stored value accounts associated with an electronic wallet service provider tied in with an issuer institution.

[0021] The term “institution” is used in a sense which is not necessarily limited to organizations which are legally constituted as banks, since in some jurisdictions other organizations may be permitted to maintain financial accounts such as a payment card account. An institution may be one of the following: a bank, a financial technology company, a telecommunication company or a financial institution.

[0022] As used in this disclosure, the terms “component,” “module,” “system,” “apparatus,” “interface,” or the like are generally intended to refer to a computer-related entity, either hardware, a combination of hardware and software, software, or software in execution. For example, a component or a module may be, but is not limited to being, a process running on a processor, a processor, an object, an executable, a thread of execution, a program, and/or a computer. By way of illustration, both an application running on a controller and the controller can be a component or a module. One or more components/modules may reside within a process and/or thread of execution and a component may be localized on one computer and/or distributed between two or more computers.

[0023] Furthermore, the claimed subject matter may be implemented as a method, apparatus, or article of manufacture using standard programming and/or engineering techniques to produce software, firmware, hardware, or any combination thereof to control a computer to implement the disclosed subject matter. For instance, the claimed subject matter may be implemented as a computer-readable medium embedded with a computer executable program, which encompasses a computer program accessible from any computer-readable storage device or storage media. For example, computer readable media can include but are not limited to magnetic storage devices (e.g., hard disk, floppy disk, magnetic strips . . .), optical disks (e.g., compact disk (CD), digital versatile disk (DVD) . . .), smart cards, and flash memory devices (e.g., card, stick, key drive . . .).

[0024] FIG.1 is a block diagram showing a payment transaction processing system according to an embodiment of the present invention. The purpose of the transaction processing system 100 is to facilitate payments from a payer associated with a payer device 110 to one of a number of payees. FIG.1 shows payee #1 120 and payee #2 130. It is envisaged

that the payer may be a small business and payee #1 120 and payee #2 130 may be suppliers of the small business. The suppliers may themselves also be small business and may or may not be equipped to process payments by payment cards. In the scenario shown in FIG.1, payee #1 is equipped to receive payments by payment card and payee #2 is not equipped to receive payments by payment card.

[0025] The payment transaction processing system 100 comprises a payment platform server 140. As will be described in more detail below, the payment platform server 140 is configured to provide so-called “merchant of record” services which provides payment card processing services for merchants which cannot accept payment by payment card. Thus for merchants such as payee #2 130 the payment platform server 140 may process payment card transactions and then generate a transfer payment transaction to a bank account associated with payee #2 120. In addition, for merchants which can accept payment card transactions, such as payee #1 120, the payment platform server 140 may route the payment card transactions to the merchant system (i.e. to payee #1 120) for the merchant to process the payment card transaction.

[0026] Is it noted that while so-called “merchant of record” transactions provide the benefit that they allow payment card transactions to be made to merchants which cannot accept themselves accept payment card transactions, the transactions in effect require two payment transactions to take place which increases the computational and network resource requirements and may in addition incur greater fees. A typical merchant of record transaction involves a payment card transaction from the payer to the merchant of record and then a second transaction which may be a bank transfer from the merchant of record to the payee. Thus, to carry out a merchant of record transaction, the payment transaction processing system 100 must execute two transactions. In contrast, if the payee does accept payment card transactions, then by routing the payment card transaction to the merchant themselves to process the transaction as a regular payment card transaction rather than a “merchant of record” transaction, the computational and network resources required are reduced.

[0027] In embodiments of the present invention, it is the payment platform server 140 that determines how to process transactions, thus there is no requirement on the payer device 110 to determine how transactions should be processed. It is envisaged that in embodiments of the present invention, the payer device 110 may be associated with a small business and used for payment of multiple invoices. Since the payees corresponding to the invoices may or may not be able to process payment card transactions, embodiments of the present invention provide a system which allows such invoices to be

processed in an efficient manner with minimal computing resources required on the payer device 110 itself.

[0028] As shown in FIG.1, the payer device 110 is communicatively coupled with an issuer server 150. The issuer server 150 is associated with a financial institution such as a bank which issues payment cards and with which the payer has an account. In some embodiments, virtual card numbers (VCNs) which relate to virtual payment cards are generated by a virtual payment card generator 160. The virtual payment card generator 160 may be a virtual card platform such as the Mastercard In Control for Commercial Payments (ICCP) platform. The virtual payment card generator 160 may generate new VCNs for individual payments which allows rapid tracking and reconciliation of the payments.

[0029] The payment card platform 140 is coupled to an acquirer server 170 which processes payment card transactions received by the payment platform. Similarly, the payee #1 120 is coupled to an acquirer server 180 which processes payment card transactions received by the payee #1 120. Each of the acquirer servers is associated with a financial institution with which the respective party (i.e. the payment platform and payee #1) hold an account to receive payment card payments.

[0030] FIG.2 is a block diagram showing functional modules of a payment platform server according to an embodiment of the present invention. As shown in FIG.2, the payment platform server 140 comprises a payment initiation request processing module 202, a virtual payment card request module 204, a payment card acceptable determination module 206, a payment card transaction processing module 208 and fund transfer transaction processing module 210. Each of the modules shown in FIG.2 may be implemented as hardware, software or a combination of hardware and software. An example of a technical architecture of the transaction data processing system 140 is described in detail below with reference to FIG.5. The payment platform server 220 is coupled to a database storing payee bank account data 220, a database storing payee know your customer data 230 and a merchant matching application programming interface 240.

[0031] The payment initiation request processing module 202 is operable to receive payment initiation requests from the payer device 110 and to extract data from the payment initiation requests. The payment initiation requests may comprise invoice which are processed by the payment initiation request processing module 202 to determine information such as the invoice amount and payee details which are used in the subsequent processing. The virtual payment card request module 204 is operable to communicate with the virtual payment card generator 160 to request issuance of new virtual payment numbers (VCNs). The

payment card acceptance determination module 206 is operable to determine whether payees are able to accept payments by payment card. In some embodiments, the payment card acceptance determination module 206 uses the merchant matching application programming interface 240 to determine whether a payee accepts payment card payments. The payment card transaction processing module 208 is operable to initiate payment card payment transactions. The fund transfer transaction processing module 210 is operable to initiate fund transfer payment transactions. The payee bank account data 220 comprises indications of bank account details for payees registered with the payment platform server. The payee know your customer data 230 stores data on the payees which may be required by national laws for entities which process financial transactions. The merchant matching application programming interface 240 is an application programming interface which provides indications whether a payee accepts payment card transactions. For example, merchant matching application programming interface 240 may match payees against an acceptance database stored by a payment network. An example of a merchant matching application programming interface is the Mastercard Merchant Match Tool (MMT).

[0032] FIG.3A to FIG.3C are flow diagrams showing transaction processing methods according to embodiments of the present invention. The methods 300, 310 and 320 shown in FIG.3A to FIG.3C are carried out by the payment platform server 140 shown in FIG.2.

[0033] The transaction processing starts with the method 300 shown in FIG.3A, then depending on whether the payee can accept payment card payments, the processing proceeds to either the method 310 shown in FIG.3B or the method 320 shown in FIG.3C.

[0034] Starting with the method 300 shown in FIG.3A, in step 302, the payment initiation request processing module 202 of the payment platform server 140 receives a payment initiation request from the payer device 110. The payment initiation request may comprise a supplier invoice for payment. The payment initiation request comprises an indication of a payee and an indication of a payment amount. This information may be included in the invoice. Other information such as a payee reference or invoice number may also be included in the invoice and payment initiation request.

[0035] In step 304, the payment initiation request processing module 202 of the payment platform server 140 receives an indication of a payment card. In some embodiments, the indication of the payment card is received at the same time as the payment initiation request in step 302. In some embodiments, this may be a regular payment card which is usable for multiple transactions. In other embodiments, the payment card is a virtual payment card number (VCN). In some embodiments, the VCN is generated and used for a single transaction. An advantage of using VCNs is that this allows for capturing of purchase and payment information such as invoice numbers and accounting codes which enhances

reconciliation accuracy which in turn reduces time and costs associated with accounts payable and accounts receivable reconciliations. Example embodiments of this processing are described below with reference to FIG.4A and FIG.4B.

[0036] FIG.4A and FIG.4B are message flow diagrams showing initial steps of transaction processing methods according to embodiments of the present invention. The processing shown in FIG.4A and FIG.4B is carried out in the payment transaction processing system 100 shown in FIG.1. The processing shown in FIG.4A and FIG.4B corresponds to steps 302 and 304 shown in FIG.3.

[0037] In the processing shown in FIG.4A, the virtual payment card generator 160 initially generates a virtual payment card number (VCN) 402. The virtual payment card generator 160 then sends the VCN 404 to the issuer server 150. The issuer server sends the VCN 404 to the payer device 110. The payer device 110 then uploads the invoice and the VCN to the payment platform server 140. Thus, in the embodiment shown in FIG.4A the payment card number is sent together with the payment initiation request. In this embodiment, the VCN may be generated by the virtual payment card generator 160 in response to a request from the payer device 110. For example, as part of the processing to generate the payment initiation request, the payer device may send a request for a VCN to the virtual payment card generator 160.

[0038] In the processing shown in FIG.4B, initially, the payer device 110 uploads an invoice 412 to the payment platform server 140 as the payment initiation request. In response to receiving the payment initiation request, the virtual payment card request module 204 of the payment platform server 140 generates a request 414 for a VCN and sends the request to the virtual payment card generator 160. The virtual payment card generator 160 then generates a VCN 416 and sends the VCN 416 to the issuer server 150. The issuer server 150 sends the VCN 416 to the payer device 110. The payer device 110 then sends the VCN 416 to the payment platform server 140. Thus, in the embodiment shown in FIG.4B, the payment platform server 140 receives the indication of the payment card after the payment initiation request.

[0039] Returning now to FIG.3A, in step 306, the payment card acceptance determination module 206 of the payment platform server 140 determines whether the payee indicated in the payment initiation request can accept payment card payments. This may involve accessing the merchant matching application programming interface 240 which in response to an indication of the payee provides an indication whether that payee corresponds to a merchant which accepts payment card payments. In an alternative embodiment, step 306 is carried out by comparison of the submitted name of the payee company with records in a database stored by a payment network to determine if the

payee accepts payment card payments. Merchant name, state/city/postal code/country/street address, and /or phone number may be used for this processing.

[0040] In step 308, a payment to the payee is initiated. Depending on the result of step 306, step 308 may be carried out as shown in FIG.3B or as shown in FIG.3C.

[0041] If it is determined in step 306 that the payee does not accept payment card payments, then step 308 is carried out according to the procedure 310 shown in FIG.3B.

[0042] As shown in FIG.3B, in step 312, the payment card transaction processing module 208 of the payment platform server initiates a payment card transaction to an account associated with the payment platform. Thus, the payment card of the payer is debited and a credit is made to an account with the acquirer server 170 corresponding to the payment platform. The procedure then progresses to step 314.

[0043] In step 314, the fund transfer transaction module 210 of the payment platform server 140 initiates a fund transfer to the payee. The fund transfer transaction module 210 may look up bank account details for the payee in the payee bank account data 220. The fund transfer is made from a bank account associated with the payment platform. Thus, in this scenario, the payment platform acts as a merchant of record for the payment transaction.

[0044] If it is determined in step 306 that the payee does accept payment card payments, then step 308 is carried out according to the procedure 320 shown in FIG.3C.

[0045] As shown in FIG.3C, in step 322, the payment card transaction processing module 208 of the payment platform server initiates a payment card transaction from the payment card to the payee. Thus, a payment card transaction is carried out between the payment card of the payer and the payee. Referring to FIG.1, the payee may be payee #1 which accepts payment card payments and thus the acquirer server 180 credits an account associated with payee #1 for the transaction amount.

[0046] is a block diagram showing a technical architecture of a platform server according to an embodiment of the present invention.

[0047] FIG.5 is a block diagram showing a technical architecture 500 of the payment platform server 140 for performing steps of exemplary methods described above. Typically, the methods are implemented by a number of computers each having a data-processing unit. The block diagram as shown in FIG.5 illustrates a technical architecture 500 of a computer which is suitable for implementing one or more embodiments herein.

[0048] The technical architecture 500 includes a processor 522 (which may be referred to as a central processor unit or CPU) that is in communication with memory devices including

secondary storage 524 (such as disk drives), read only memory (ROM) 526, random access memory (RAM) 228. The processor 522 may be implemented as one or more CPU chips. The technical architecture 520 may further comprise input/output (I/O) devices 530, and network connectivity devices 532.

[0049] The secondary storage 524 is typically comprised of one or more disk drives or tape drives and is used for non-volatile storage of data and as an over-flow data storage device if RAM 528 is not large enough to hold all working data. Secondary storage 224 may be used to store programs which are loaded into RAM 528 when such programs are selected for execution. In this embodiment, the secondary storage 524 has a payment initiation request processing module 502, a virtual payment card request module 504, a payment card acceptance determination module 506, a payment card transaction module 508, and a fund transfer transaction processing module 510 comprising non-transitory instructions operative by the processor 522 to perform various operations of the method of the present disclosure. As depicted in FIG.5, the modules 502-510 are distinct modules which perform respective functions implemented by the payment platform server 140. It will be appreciated that the boundaries between these modules are exemplary only, and that alternative embodiments may merge modules or impose an alternative decomposition of functionality of modules. For example, the modules discussed herein may be decomposed into sub-modules to be executed as multiple computer processes, and, optionally, on multiple computers. Moreover, alternative embodiments may combine multiple instances of a particular module or sub-module. It will also be appreciated that, while a software implementation of the modules 502-510 is described herein, these may alternatively be implemented as one or more hardware modules (such as field-programmable gate array(s) or application-specific integrated circuit(s)) comprising circuitry which implements equivalent functionality to that implemented in software. The ROM 526 is used to store instructions and perhaps data which are read during program execution. The secondary storage 524, the RAM 528, and/or the ROM 526 may be referred to in some contexts as computer readable storage media and/or non-transitory computer readable media.

[0050] The I/O devices may include printers, video monitors, liquid crystal displays (LCDs), plasma displays, touch screen displays, keyboards, keypads, switches, dials, mice, track balls, voice recognizers, card readers, paper tape readers, or other well-known input devices.

[0051] The network connectivity devices 532 may take the form of modems, modem banks, Ethernet cards, universal serial bus (USB) interface cards, serial interfaces, token ring cards, fiber distributed data interface (FDDI) cards, wireless local area network (WLAN) cards, radio transceiver cards that promote radio communications using protocols such as

code division multiple access (CDMA), global system for mobile communications (GSM), long-term evolution (LTE), worldwide interoperability for microwave access (WiMAX), near field communications (NFC), radio frequency identity (RFID), and/or other air interface protocol radio transceiver cards, and other well-known network devices. These network connectivity devices 532 may enable the processor 522 to communicate with the Internet or one or more intranets. With such a network connection, it is contemplated that the processor 522 might receive information from the network, or might output information to the network in the course of performing the method operations described herein. Such information, which is often represented as a sequence of instructions to be executed using processor 522, may be received from and outputted to the network, for example, in the form of a computer data signal embodied in a carrier wave.

[0052] The processor 522 executes instructions, codes, computer programs, scripts which it accesses from hard disk, floppy disk, optical disk (these various disk based systems may all be considered secondary storage 524), flash drive, ROM 526, RAM 528, or the network connectivity devices 532. While only one processor 522 is shown, multiple processors may be present. Thus, while instructions may be discussed as executed by a processor, the instructions may be executed simultaneously, serially, or otherwise executed by one or multiple processors.

[0053] It is understood that by programming and/or loading executable instructions onto the technical architecture 500, at least one of the CPU 522, the RAM 528, and the ROM 526 are changed, transforming the technical architecture 500 in part into a specific purpose machine or apparatus having the novel functionality taught by the present disclosure. It is fundamental to the electrical engineering and software engineering arts that functionality that can be implemented by loading executable software into a computer can be converted to a hardware implementation by well-known design rules.

[0054] Whilst the foregoing description has described exemplary embodiments, it will be understood by those skilled in the art that many variations of the embodiments can be made within the scope of the invention as defined by the claims. Moreover, features of one or more embodiments may be mixed and matched with features of one or more other embodiments.

CLAIMS

1. A payment platform system for processing payment transactions, the payment platform system comprising: a processor, and a data storage device, data storage device storing computer program instructions operable to cause the processor to:

receive, from a payer, a payment initiation request for a payment from the payer to a payee, the payment initiation request comprising an indication of the payee and an indication of a payment amount;

receive an indication of a payment card associated with the payer;

determine if the payee accepts payment card payments;

if the payee accepts payment card payments, initiate a payment card transaction from the payment card associated with the payer to an account associated with the payee; and

if the payee does not accept payment card payments initiate a payment card transaction from the payment card associated with the payer to an account associated with the payment platform and initiate a fund transfer for the payment amount from an account associated with the payment platform to an account associated with the payee.

2. The payment platform server according to claim 1, wherein the data storage device stores instructions operable to cause the processor to determine if the payee accepts payment card payments by accessing an application programming interface.

3. The payment platform server according to claim 1, wherein the data storage device stores instructions operable to cause the processor to determine if the payee accepts payment card payments by comparing a company name associated with the payee with a database of payment card transaction receiving entities.

4. The payment platform server according to any preceding claim, wherein the payment card associated with the payer is a virtual payment card number.

5. The payment platform server according to claim 4, wherein the data storage device stores instructions operable to cause the processor to request a virtual payment card number in response to receiving the payment initiation request.

6. The payment platform server according to any one of claims 1 to 4, wherein the payment initiation request comprises the indication of the payment card associated with the payer.

7. The payment platform server according to any preceding claim, wherein the payment initiation request comprises an invoice and the invoice comprises the indication of the payee and the indication of the payment amount.

8. A payment transaction processing method, in a payment platform server, the method comprising:

receiving, from a payer, a payment initiation request for a payment from the payer to a payee, the payment initiation request comprising an indication of the payee and an indication of a payment amount;

receiving an indication of a payment card associated with the payer;

determining that the payee accepts payment card payments; and

initiating a payment card transaction from the payment card associated with the payer to an account associated with the payee.

9. A payment transaction processing method, in a payment platform server, the method comprising:

receiving, from a payer, a payment initiation request for a payment from the payer to a payee, the payment initiation request comprising an indication of the payee and an indication of a payment amount;

receiving an indication of a payment card associated with the payer;

determining that the payee does not accept payment card payments;

initiating a payment card transaction from the payment card associated with the payer to an account associated with the payment platform; and

initiating a fund transfer for the payment amount from an account associated with the payment platform to an account associated with the payee.

10. The payment transaction processing method according to claim 8 or claim 9, wherein determining that the payee does or does not accept payment card payments comprises accessing an application programming interface.

11. The payment transaction processing method according to claim 8 or claim 9, wherein determining that the payee does or does not accept payment card payments comprises comparing a company name associated with the payee with a database of payment card transaction receiving entities.

12. The payment transaction processing method according to any one of claims 8 to 11, wherein the payment card associated with the payer is a virtual payment card number.

13. The payment transaction processing method according to claim 12, further comprising requesting a virtual payment card number in response to receiving the payment initiation request.

14. The payment transaction processing method according to any one of claims 8 to 13, wherein the payment initiation request comprises the indication of the payment card associated with the payer.

15. The payment transaction processing method according to any one of claims 8 to 14, wherein the payment initiation request comprises an invoice and the invoice comprises the indication of the payee and the indication of the payment amount.

16. A non-transitory computer readable medium carrying computer executable instructions which when executed on at least one processor cause the at least one processor to carry out a method according to any one of claims 8 to 15.