

ELECTRONIC SYSTEM AND COMPUTERIZED METHOD FOR IDENTIFYING PAYMENT INSTRUMENTS FOR PAYMENT TRANSACTIONS

Technical Field

[0001] The present disclosure generally relates to electronic systems and computerized methods for identifying payment instruments for payment transactions. Particularly, the present disclosure describes various embodiments of electronic systems and computerized methods for identifying payment instruments based on identifiers, such as email address and phone number, for sending and receiving payments in payment transactions.

Background

[0002] Proxy identifiers are increasingly being used in payment systems in various countries. For example, Singapore has implemented the PayNow service linking bank accounts to mobile numbers and India has implemented the Unified Payments Interface (UPI) system linking bank accounts to virtual payment addresses (VPAs). Mobile numbers and VPAs are examples of proxy identifiers linked to payment instruments such as bank accounts, so that users can instruct payments from the payment instruments using the proxy identifiers. However, a payment instrument can be linked to only a limited number of proxy identifiers, such as a user's phone number or national identification number. This restricts payment transactions using proxy identifiers to domestic user-to-user or person-to-person (P2P) payment transactions only.

[0003] Therefore, in order to address or alleviate at least one of the aforementioned problems and/or disadvantages, there is a need to provide an improved electronic system and computerized method for identifying payment instruments for payment transactions.

Summary

[0004] According to a first aspect of the present disclosure, there is a computer system, a computerized method performed by the computer system, and a non-transitory computer-readable storage medium comprising instructions for identifying payment instruments for payment transactions. The computer system comprises a communication module, an identification module, and a determination module configured for performing steps of the method.

[0005] The communication request module is configured for receiving, from an electronic device of a first user, instructions for payment from the first user to a second user, the payment instructions comprising a payment amount and an identifier of the second user.

[0006] The identification module is configured for identifying a plurality of predefined payment instruments of the second user associated with the second user identifier.

[0007] The determination module is configured for determining a payment instrument of the second user from the plurality of predefined payment instruments of the second user based on the payment instructions and a set of conditions predefined by the second user.

[0008] The communication request module is further configured for communicating, to a payment institution for a payment instrument of the first user, identification data of the second user payment instrument for processing a payment transaction based on the payment instructions in cooperation with at least one payment network. The payment amount is subsequently transferred from the first user payment instrument to the second user payment instrument upon completion of said processing of the payment transaction.

[0009] An electronic system and computerized method for identifying payment instruments for payment transactions according to the present disclosure are thus disclosed herein. Various features, aspects, and advantages of the present disclosure will become more apparent from the following detailed description of the embodiments

of the present disclosure, by way of non-limiting examples only, along with the accompanying drawings briefly described below.

Brief Description of the Drawings

[0010] Figure 1 is an illustration of an electronic system for identifying payment instruments for payment transactions, in accordance with embodiments of the present disclosure.

[0011] Figure 2 is a flowchart illustration of a computerized method implemented on a computer system for identifying payment instruments for payment transactions, in accordance with embodiments of the present disclosure.

[0012] Figure 3 is a flowchart illustration of a registration process for users to associate the payment instruments with user identifiers, in accordance with embodiments of the present disclosure.

[0013] Figure 4 is a schematic illustration of a computerized method implemented on the electronic system for identifying payment instruments for a payment transaction between a sender and a receiver, in accordance with embodiments of the present disclosure.

[0014] Figure 5 are illustrations of screenshots of an app for performing the payment transaction illustrated in Figure 4, in accordance with embodiments of the present disclosure.

[0015] Figure 6 is a schematic illustration of yet another computerized method implemented on the electronic system for identifying payment instruments for a payment transaction between a sender and a receiver, in accordance with embodiments of the present disclosure.

[0016] Figure 7 are illustrations of screenshots of an app for performing the payment transaction illustrated in Figure 6, in accordance with embodiments of the present disclosure.

[0017] Figure 8 is a block diagram illustration of the technical architecture of a computer system, in accordance with embodiments of the present disclosure.

Detailed Description

[0018] In the present disclosure, depiction of a given element or consideration or use of a particular element number in a particular figure or a reference thereto in corresponding descriptive material can encompass the same, an equivalent, or an analogous element or element number identified in another figure or descriptive material associated therewith. The use of "/" in a figure or associated text is understood to mean "and/or" unless otherwise indicated. For purposes of brevity and clarity, descriptions of embodiments of the present disclosure are directed to an electronic system and computerized method for identifying payment instruments for payment transactions, in accordance with the drawings. While aspects of the present disclosure will be described in conjunction with the embodiments provided herein, it will be understood that they are not intended to limit the present disclosure to these embodiments. On the contrary, the present disclosure is intended to cover alternatives, modifications and equivalents to the embodiments described herein, which are included within the scope of the present disclosure as defined by the appended claims. Furthermore, in the following detailed description, specific details are set forth in order to provide a thorough understanding of the present disclosure. However, it will be recognized by an individual having ordinary skill in the art, i.e. a skilled person, that the present disclosure may be practiced without specific details, and/or with multiple details arising from combinations of aspects of particular embodiments. In a number of instances, known systems, methods, procedures, and components have not been described in detail so as to not unnecessarily obscure aspects of the embodiments of the present disclosure.

Overview

[0019] In representative or exemplary embodiments of the present disclosure as illustrated in Figure 1, there is an electronic system 100 including a computer system 102 for identifying payment instruments for payment transactions. The computer system 102 operates an identifier or proxy platform or service that is accessible by electronic devices of users and payment institutions for identifying the payment instruments. For purpose of brevity, various embodiments herein are described as a system 100 involving a payment transaction between two users – a first user 104 and a second user 106 – but it will be appreciated that payment transactions can occur between any pair of users.

[0020] The system 100 includes a first user electronic device 108 operated by the first user 104 and a second electronic device 110 operated by the second user 106. Each user owns or uses a number of payment instruments such as credit cards and bank accounts. Each payment instrument is provided by a payment institution, such as a bank, that funds the payment instruments so that the users can use the payment instruments in payment transactions. As shown in Figure 1, the first user 104 has a number of first user payment instruments 112 and the second user 106 has a number of second user payment instruments 114. The first user payment instruments 112 are provided by respective first payment institutions 116 and the second user payment instruments 114 are provided by respective second payment institutions 118.

[0021] Each user 104 / 106 defines a set of one or more identifiers 120 / 122 to be associated with each of their respective payment instruments 112 / 114. For example, the first user 104 defines an identifier 120 to be associated with one or more of his/her payment instruments 112, and also defines each payment instrument 112 to be associated with at least one identifier 120. Similarly, the second user 106 defines an identifier 122 to be associated with one or more of his/her payment instruments 114, and also defines each payment instrument 114 to be associated with at least one identifier 122. The user identifiers 120 / 122 are thus linked to the payment instruments 112 / 114 and may include primary identifiers such as bank account numbers and credit card numbers. The user identifiers may further include secondary identifiers which are also known as proxy identifiers or virtual payment addresses (VPAs). Non-

limiting examples of such proxy identifiers include email addresses and phone numbers.

[0022] In many embodiments, a software or mobile application is installed and executable on the electronic devices 108 / 110 and is communicable with the computer system 102 for initiating payment transactions, as well as for associating the payment instruments 112 / 114 with user identifiers 120 / 122. The application may be a payment-type app such as a banking or digital wallet app provided by the payment institution 116 / 118, or non-payment-type app such as a communication app such as a messaging or email app. In some embodiments, the users 104 / 106 may use the electronic devices 116 to access an online communication platform, such as an online email interface, to initiate the payment transactions. Such communication platforms are payment agnostic so the users 104 / 106 can initiate the payment transactions using the identifiers 120 / 122. The proxy platform identifies the payment instruments 112 / 114, which may be provided by different payment institutions 116 / 118, based on the user identifiers 120 / 122 contained in a message sent via the communication platform. The payment transactions are processed by the payment institutions 116 / 118 across at least one payment network 124. A payment network 124 may also be referred to as a payment rail for moving money or funds between the payment instruments 112 / 114.

[0023] The computer system 102, electronic devices 108 / 110, payment institutions 116 / 118, and payment network 124 are communicable with one another through a communication network 126. Each payment institution 116 / 118 operates its own computer system, e.g. a server, that is communicable with the communication network 126. It will be appreciated that electronic communications with the payment institutions 116 / 118 occur with respect to the computer systems or servers operated by them.

[0024] With reference to Figure 2, there is shown a computer-implemented or computerized method 200 implemented on the computer system 102 for identifying payment instruments 112 / 114 for payment transactions. The computer system 102 includes various modules / components for performing various steps of the method

200, including a communication module, an identification module, a determination module, and a registration module.

[0025] In a step 202 of the method 200, the communication module receives, from the electronic device 108 of the first user 104, instructions for payment from the first user 104 to the second user 106. The payment instructions include a payment amount and an identifier 122 of the second user 106. The payment instructions may further include an identifier 120 of the first user 104 or identification data of a payment instrument 112 of the first user 104. In a step 204, the identification module identifies a plurality of predefined payment instruments 114 of the second user 106 associated with the second user identifier 122. Optionally, the identification module identifies a plurality of predefined payment instruments 112 of the first user 104 associated with the first user identifier 120.

[0026] In a step 206, the determination module determines a payment instrument 114 of the second user 106 from the plurality of predefined payment instruments 114 of the second user 106 based on the payment instructions and a set of conditions predefined by the second user 106. Optionally, the determination module determines the first user payment instrument 112 from the plurality of predefined payment instruments 112 of the first user 104 based on the payment instructions and a set of conditions predefined by the first user 104. The set of conditions for each user 104 / 106 represents rules predefined by the respective user 104 / 106 for determining or selecting the particular payment instrument 112 / 114 for a payment transaction if the user 104 / 106 has multiple payment instruments 112 / 114 associated with the respective user identifier 120 / 122 contained in the payment instructions.

[0027] In a step 208, the communication module communicates, to a payment institution 116 for the first user payment instrument 112, identification data of the second user payment instrument 114 for processing the payment transaction based on the payment instructions in cooperation with the at least one payment network 124. In one embodiment, the payment institution 116 is known if the first user payment instrument 112 is selected by the first user 104 for the payment transaction and the payment instructions include the identification data of the first user payment instrument

112. In another embodiment, the payment instructions include the first user identifier 120 and the proxy platform determines the first user payment instrument 112 from the first user identifier 120, payment instructions, and predefined conditions as described above. The payment institution 116 is identified based on the determined first user payment instrument 112. The payment amount is subsequently transferred from the first user payment instrument 112 to the second user payment instrument 114 upon completion of said processing of the payment transaction via their respective payment institutions 116 / 118.

[0028] In some embodiments, the communication module is further configured for communicating an error message to the first user electronic device 108 in response to failure to determine the first and/or second user payment instrument 112 / 114. For example, the step 206 may result in multiple payment instruments 114 of the second user 106, i.e. a single second user payment instrument 114 cannot be identified to receive payment. This may happen due to conflict in the conditions set by the second user 106. Alternatively, the step 206 may result in failure to determine and identify any second user payment instrument 114. This may happen if the second user 106 did not define a default payment instrument in the event of conflict in the conditions or the second user 106 did not register the user identifier 122 with any payment instrument 114.

[0029] Accordingly, the proxy platform operated on the computer system 102 associates user identifiers like phone numbers and email addresses to payment instruments like bank accounts and credit cards. Each user identifier can be mapped to one or more payment instruments, and each payment instrument can be mapped to one or more user identifiers. For a sender to pay to a receiver, the receiver only needs to give the receiver's user identifier to the sender without the need to share any sensitive information, such as bank account number. The proxy platform identifies the sender's payment instrument and receiver's payment instrument based on the sender's user identifier and receiver's user identifier and also further based on predefined conditions set by the sender / receiver to determine the respective payment instruments if a user identifier is associated with multiple payment instruments. Use of the user identifiers simplifies the payment transaction and the payment transaction

can be processed more efficiently, allowing the receiver to more quickly receive payment from the sender.

Description of Embodiments

[0030] References to “an embodiment / example”, “another embodiment / example”, “some embodiments / examples”, “some other embodiments / examples”, and so on, indicate that the embodiment(s) / example(s) so described may include a particular feature, structure, characteristic, property, element, or limitation, but that not every embodiment / example necessarily includes that particular feature, structure, characteristic, property, element or limitation. Furthermore, repeated use of the phrase “in an embodiment / example” or “in another embodiment / example” does not necessarily refer to the same embodiment / example.

[0031] As used herein, the terms “a” and “an” are defined as one or more than one. The terms “comprising”, “including”, “having”, and the like do not exclude the presence of other features / elements / steps than those listed in an embodiment. Recitation of certain features / elements / steps in mutually different embodiments does not indicate that a combination of these features / elements / steps cannot be used in an embodiment. The term “set” is defined as a non-empty finite organization of elements that mathematically exhibits a cardinality of at least one (e.g. a set as defined herein can correspond to a unit, singlet, or single-element set, or a multiple-element set), in accordance with known mathematical definitions. As used herein, the terms “first” and “second” are used merely as labels or identifiers and are not intended to impose numerical requirements on their associated terms.

[0032] As used herein, the terms “component”, “module,” “system”, “apparatus”, “interface”, and 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 / module. One or more

components / modules may reside within a process and/or thread of execution. A component / module may be localized on one computer and/or distributed among a plurality of computers.

[0033] While various terms as used in representative or exemplary embodiments of the present disclosure are defined herein, the definitions of these terms are not intended to be limited as such and are in addition to their plain meanings according to standard English dictionaries.

[0034] In various embodiments of the present disclosure, the electronic system 100 includes the computer system 102 for identifying payment identifying payment instruments 112 / 114 for payment transactions. The computer system 102 may also be referred to as a server 102 that may be based on a centralized model, decentralized model, or a hybrid model having a combination of elements from the centralized and decentralized models. The system 100 further includes the electronic devices 108 / 110, payment institutions 116 / 118, and at least one payment network 124, wherein one or more or all of which are communicable with one another through the communication network 126.

[0035] The server 102 operates an identifier or proxy platform or service that is accessible by the user electronic devices 108 / 110 and payment institutions 116 / 118 for identifying the user payment instruments 112 / 114 from the user identifiers 120 / 122. In some embodiments, the server 102 is operated by a service provider independent of the payment network 124 or a payment network operator. In some embodiments, the server 102 is associated with the payment network 124 which is operated by an intermediary entity. Typically, the intermediary entity is a card association, such as a credit card association, that facilitates communications between the payment institutions 116 / 118, such as acquirer institutions and issuer institutions, to authorize and fund transactions. The payment network 124 settles the transactions between various acquirer institutions and issuer institutions, when payment instruments such as credit cards are used for payment of transactions. One example of a payment network is the Banknet payment network operated by Mastercard. It will be appreciated that the payment transactions are processed by the payment network

124 in accordance with one or more standards for the interchange of transaction messages, such as the ISO 8583 standard, and occurs in a standard manner across the payment network 124, such as via the conventional four-party system or three-party system.

[0036] In some embodiments, a software or mobile application is installed and executable on the electronic devices 108 / 110 for initiating the payment transactions. Each electronic device 108 / 110 may be a mobile device, mobile phone, smartphone, personal digital assistant (PDA), tablet, phablet, laptop, computer, other communication device, or the like. The application may be a banking or digital wallet app provided by the payment institution 116 / 118, or a communication app such as a messaging or email app. In some embodiments, the electronic devices 116 access an online communication platform, such as an online email interface or an interface provided by the proxy platform, to initiate the payment transactions. The electronic devices 108 / 110 are thus able to access a payment service provider (PSP) via the apps or interfaces exemplarily described above, wherein the PSP consumes an application programming interface (API) provided by the proxy platform so that the electronic devices 108 / 110 is communicable with the server 102 to utilize the proxy platform.

[0037] In some embodiments, the payment institutions 116 / 118 are able to communicate with the server 102 and access the proxy platform via the PSPs for the electronic devices 108 / 110, such that the payment institutions 116 / 118 are able to utilize the proxy platform for identifying the payment instruments 112 / 114. In some embodiments, the payment institutions 116 / 118 consumes the API of the proxy platform on their servers so that they are able to communicate directly with the server 102 and directly access the proxy platform. Accordingly, the server 102, electronic devices 108 / 110, and payment institutions 116 / 118 are communicable with one another in various manners for accessing the proxy platform to identify the payment instruments 112 / 114 of the users 104 / 106.

[0038] A user 104 / 106 is a person who owns or uses a number of payment instruments 112 / 114. According to the legal definition of the term "person", the user

104 / 106 may be a natural person or some other legal entity, such as a corporation, company, organization, government entity, partnership, firm, association, or society.

[0039] The payment instruments 112 / 114 refer to any suitable cashless payment mechanism which the users 104 / 106 may use to perform transactions, such as deposits and withdrawals, credit transfers, merchandise purchase, payment transactions, and the like. Non-limiting examples of the payment instruments 112 / 114 include financial accounts, bank accounts, stored-value accounts, payment cards, credit cards, debit cards, membership cards, promotional cards, contactless cards, charge cards, frequent flyer cards, gift cards, prepaid cards, and the like. The payment instruments 112 / 114 may be stored electronically in memory of the electronic devices 112 / 114, such as on banking or digital wallet app resident or operative on the electronic devices 112 / 114. For example, the payment instruments 112 / 114 may be in the form of stored-value accounts (e.g. stored or prepaid credits) in closed-loop digital wallets such as those offered by various merchants. Each payment instrument 112 / 114 has a unique primary identifier, such as an account number or card number. For example, a financial account or bank account has an International Bank Account Number (IBAN) in accordance with the international standard ISO 13616:2007, and a credit card or debit card typically has a 16-digit card number.

[0040] The payment instruments 112 / 114 are maintained by the payment institutions 116 / 118 which fund the payment instruments 112 / 114 for making payments in payment transactions. The payment institutions 116 / 118 may be financial institutions such as banks which may operate as issuer and acquirer banks in payment transactions, as will be understood by the skilled person. These financial institutions are typically members of at least one payment network 124 so that payments involving financial institutions on the same payment network 124 can be readily processed. However, it should be appreciated that payment transactions involving financial institutions on different payment networks 124 may still be processed through interoperability of the payment networks 124, such as common connection to another open-loop payment network 124. The payment institutions 116 / 118 may also be organizations that provide the payment instruments 112 / 114 in the form of closed-loop digital wallets that run on their own payment networks 124. Some non-limiting

examples of such organizations include a beverage or coffeehouse retail chain which provides a digital wallet for payments at their outlets, and a service aggregator which provides a digital wallet for payments at various merchants linked to the service aggregator.

[0041] The communication network 126 is a medium or environment through which content, notifications, and/or messages are communicated among various entities. Some non-limiting examples of the communication network 126 include a virtual private network (VPN), wireless fidelity (Wi-Fi) network, light fidelity (Li-Fi) network, local area network (LAN), wide area network (WAN), metropolitan area network (MAN), satellite network, Internet, fiber optic network, coaxial cable network, infrared (IR) network, radio frequency (RF) network, and any combination thereof. Various entities in the communication network 126 may connect to the communication network 126 in accordance with various wired and wireless communication protocols, such as Transmission Control Protocol / Internet Protocol (TCP/IP), User Datagram Protocol (UDP), 2nd to 5th Generation (2G to 5G) communication protocols, Long Term Evolution (LTE) communication protocols, and any combination thereof. Each party to the communication network 126 includes a data communication or transceiver module to communicate and transmit / receive data over the communication network 126. Some non-limiting examples of a transceiver module include an antenna module, a radio frequency transceiver module, a wireless transceiver module, a Bluetooth transceiver module, an Ethernet port, a Universal Serial Bus (USB) port, or any other module / component / device configured for transmitting and receiving data.

[0042] As described above, the users 104 / 106 have user identifiers 120 / 122 that are associated with the payment instruments 112 / 114. For each user 104 / 106, associating each user identifier 120 / 122 with at least one payment instrument 112 / 114, and similarly associating each payment instrument 112 / 114 with at least one user identifier 120 / 122 allows the payment instruments 112 / 114 to be identified for payment transactions based on the user identifiers contained in the payment instructions. The associations between the user identifiers 120 / 122 and payment instruments 112 / 114 are achieved by a registration process 300 performed by the registration module of the server 102. The users 104 / 106 operate the respective

electronic devices 108 / 110 to access the proxy platform to perform the registration process 300.

[0043] With reference to Figure 3A, in a step 302 of the registration process 300, the server 102 receives a registration request from the electronic device 108 / 110 of the respective user 104 / 106. The registration request includes a number of user identifiers 120 / 122 of the user 104 / 106, identification data of a number of payment instruments 112 / 114 of the user 104 / 106, and the set of conditions predefined by the user 104 / 106. The user identifiers 120 / 122 may be categorized into various categories, such as but not limited to, assigned identifiers, acquired identifiers, and lexical identifiers. Assigned identifiers may refer to those that are assigned by organizations such as government entities, and may include national identification numbers, tax identification numbers, social security numbers, and the like. Acquired identifiers may refer to those that have been acquired by the users 104 / 106, and may include personal names, organization names, email addresses, phone numbers, vehicle registration numbers, digital wallet identifiers, codified data identifiers, credit card numbers, and bank account numbers such as IBANs, and the like. Some non-limiting examples of a codified data identifier include Quick Response (QR) code, barcode, EZcode, high capacity color barcode, ShotCode, MaxiCode, GTIN12 code, GTIN-13 code, and Aztec code. Lexical identifiers may refer to those that are created by the users 104 / 106, and may include social media handles such as social media account usernames, usernames for online communication platforms, usernames for e-commerce or online marketplace platforms.

[0044] In a step 304, the server 102 associates each user identifier 120 / 122 to at least one payment instrument 112 / 114 of the respective user 104 / 106. The user identifiers 120 / 122 are distinct and unique to the users 104 / 106 so that the users 104 / 106 can share them with others for receiving payments. For example, the second user 106 shares a non-sensitive user identifier 122, such as an email address or phone number both of which are unique to the second user 106, with the first user 104 so that the first user 104 can initiate a payment transaction using the second user identifier 122 for transferring a payment amount to a payment instrument 114 of the second user 106.

[0045] Associating payment instruments 112 / 114 to the user identifiers 120 / 122 may involve authentication / security measures such as authentication of payment instruments 112 / 114 by the respective payment institutions 116 / 118. The authentication / security measures may include a one-time passcode (OTP) communicated from the payment institutions 116 / 118, or other known measures such as predefined PINs / passwords and biometric authentication.

[0046] Table 310 in Figure 3B illustrates examples of the user identifiers or proxies and their associated payment instruments for an exemplary user. Details of the payment instruments may include account numbers or identifiers, bank codes or payment institution identifiers, and bank country codes according to ISO convention. Other details for bank accounts may include routing codes, SWIFT codes, and BIC codes. Notably, the country codes 702 and 036 represent payment institutions or banks in Singapore and Australia, respectively. The country code 000 is a generic one which can be used to represent non-banking digital wallets, such as those provided by various merchants. Table 310 lists such digital wallets as provided by a first merchant and a second merchant. Non-numerical characters in the account numbers and bank codes can likewise identify such non-banking digital wallets. As shown in Table 310, the user identifier “JohnDoe@email001.com” is associated with two payment instruments (bank accounts “198-1234-3” and “452-2345-0”, the payment instrument (bank account “198-1234-3”) is associated with two user identifiers (“JohnDoe@email001.com” and “+65 8123 4567”. Further, the user identifier “+65 9876 5432” is associated with the payment instrument (bank account “1934-3456-7890”). This means that a payment sent to the user identifier “+65 9876 5432”, which is a Singapore phone number, is routed to the bank account “1934-3456-7890”, which is held in an Australian bank.

[0047] In some embodiments, the first user 104 wants to transfer a payment amount to the second user 106. The first user 104 may be an individual user and the second user 106 may be a government organization, and the payment may be for tax purpose. The second user 106 may generate the second user identifier 122 specifically for the first user 104, and other second user identifiers 122 for other first users 104. This

allows different first users 104 (different tax payers) to pay to the same second user 106 (government organization) using different second user identifiers 122, each being unique to the respective first user 104. Further, during generation of the second user identifiers 122, the respective first user 104 may be requested by the second user 106 to complete relevant documents, such as government forms. This may be done only once to create the unique second user identifier 122, which can continually be used later for payments, e.g. one-time or recurring payments, to the second user 106.

[0048] In a step 306, the server 102 applies the set of conditions to the user payment instruments 112 / 114. When transferring a payment to the second user 106, the payment instructions contain the second user identifier 122 which may be associated with two or more second user payment instruments 114. These conditions are rules set by the second user 106 that determine which one of the second user payment instruments 114 to route a payment based on the payment instructions, such as payment amount and who is the first user 104. Similarly, if the first user 104 has two or more first user payment instruments 112 associated with a first user identifier 120, the conditions defined by the first user 104 determines which one of the first user payment instruments 112 to send the payment from. It will be appreciated that these conditions may be edited and/or deleted at any time, and new conditions may be added as well.

[0049] Table 320 in Figure 3C illustrates examples of conditions set by an exemplary user for sending payment, i.e. these conditions apply when the user is sending money to another user. Table 330 in Figure 3D illustrates examples of conditions set by an exemplary user for receiving payment, i.e. these conditions apply when the user is receiving money from another user. For example, a specific payment instrument for sending / receiving money is determined based on the payment amount and/or currency. The payment instrument for sending / receiving money may also be determined by who is the receiver / sender and the purpose of the payment.

[0050] Table 340 in Figure 3E illustrates examples of separate conditions set by an exemplary user for both sending and receiving payment, i.e. these conditions apply depending on whether the user is sending or receiving money. Further, the conditions

may be applied in a predefined order as defined by the user for determining the payment instruments for the respective user. In other words, the conditions are prioritized and applied sequentially until a suitable payment instrument is determined for sending / receiving payment. Yet further, the user may define the conditions to enable a default payment instrument of the user to be determined. The default payment instrument is defined by the user such that if a suitable payment instrument cannot be determined based on the predefined conditions and the payment instructions, the default payment instrument will be determined as the one for sending / receiving payment. Selection of a default payment instrument is exemplarily shown in Table 310 and Table 340.

[0051] The conditions thus assist in determining which one of multiple payment instruments 112 / 114 associated with one user identifier 120 / 122 for sending / receiving payment based on the payment instructions. The payment instructions may include a payment message indicating the payment purpose, such as for wages or a merchant purchase. The conditions may relate to at least one of payment amount, identifier, payment purpose, and payment currency. The conditions may be selected from predefined lists, such as drop-down menus, of common conditions and options associated therewith, such as currency options and ranges for payment amounts. Additionally, when a payment that is sent / received qualifies for more than one condition, the conditions may be prioritized and applied sequentially to resolve the conflict and determine the specific payment instrument to send / receive payment. Yet additionally, if a suitable payment instrument cannot be determined from the conditions, the default payment instruction is selected to send / receive payment, thus ensuring that the payment transaction can be successfully processed.

[0052] Some exemplary uses cases of how the conditions are applied are described as follows. The first user 104 may want to send \$10 to the second user identifier 122 which is an email address that is mapped to multiple second user payment instruments 114. The second user 106 may have defined the conditions such that all payments below \$15 are routed to her Mastercard card. The second user 106 may alternatively have defined the conditions such that all payments tagged as “work” (in the payment message) are routed to her bank account at a certain bank.

[0053] In some embodiments with reference to Figure 4, there is a computer-implemented or computerized method 400 implemented on the system 100 for identifying payment instruments 112 / 114 for a payment transaction between the first user 104 (sender) and the second user 106 (receiver). The method 400 relates to an exemplary use case for a payment transaction initiated from a payment-related app, such as a banking or digital wallet app.

[0054] In a step 402 of the method 400, the sender 104 executes the banking or digital wallet app installed on the sender electronic device 108 to initiate the payment transaction. Alternatively, the sender electronic device 108 accesses an online website or interface related to banking or digital wallet app, such as a website of the payment institution 116, to initiate the payment transaction. In a step 404, the sender 104 selects the sender payment instrument 112 and prepares payment instructions. In one embodiment, the sender payment instrument 112 is integrated with the digital wallet app. In another embodiment, the sender payment instrument 112 is selected from one or more payment instruments 112 of the sender 104 held at the sender payment institution 116, such as bank accounts held at a bank. The payment instructions include a payment amount and the receiver identifier 122. The payment instructions may further include identification data of the sender payment instrument 112 which may be used to determine the receiver payment instrument 114 as described below.

[0055] In a step 406, the sender electronic device 108 communicates the payment instructions to the sender payment institution 116 for the selected sender payment instrument 112. In a step 408, the sender payment institution 116 communicates the payment instructions to the server 102. The proxy platform operated on the server 102 thus receives the receiver identifier 122 contained in the payment instructions from the sender electronic device 108.

[0056] In a step 410, the proxy platform identifies the receiver payment instrument 114 associated with the receiver identifier 122. In one embodiment, the receiver identifier 122 is associated with a plurality of receiver payment instruments 114. The proxy platform then determines the suitable receiver payment instrument 114 from the

plurality of receiver payment instruments 114 based on the payment instructions and the conditions predefined by the receiver 106. In another embodiment, the receiver identifier 122 is associated with one receiver payment instrument 114. The receiver payment instrument 114 can thus be identified without resolving the receiver conditions.

[0057] In some embodiments, the receiver 106 has set the conditions such that the sender identifier 120 is a factor in determining the receiver payment instrument 114. The payment instructions may include the identification data of the sender payment instrument 114 for the proxy platform to determine the sender identifier 120 based on the payment instructions and the conditions set by the sender 104. Once the sender identifier 120 is determined, the receiver payment instrument 114 can be consequently determined. Alternatively, the payment instructions may include the sender identifier 120 this can be known from the app when initiating the payment transaction.

[0058] In a step 412, the server 102 communicates, to the sender payment institution 116, the identification data of the receiver payment instrument 114. In a step 414, the sender payment institution 116 processes the payment transaction based on the payment instructions in cooperation with the payment network 124 and the receiver payment institution 118 for the receiver payment instrument 114. It will be appreciated that the payment transaction is processed in a standard manner across, such as via the conventional four-party system or three-party system. It will also be appreciated that processing of the payment transaction may involve authentication / security measures such as authentication of the sender payment instrument 112 for debiting the payment amount. The authentication / security measures may include an OTP communicated from the sender payment institution 116 to the sender electronic device 108 or another electronic device of the sender 104, such as one for receiving text messages for the OTP.

[0059] Upon completion of said processing of the payment transaction, the payment amount as indicated in the payment instructions is transferred from the sender payment instrument 112 to the receiver payment instrument 114. In a step 416, the sender payment institution 116 communicates to the sender electronic device 108 a

message informing the sender 104 that the payment transaction has been successfully processed and the payment amount has been debited from the sender payment instrument 112. Similarly, in a step 418, the receiver payment institution 118 communicates to the receiver electronic device 110 a message informing the receiver 106 that the payment transaction has been successfully processed and the payment amount has been credited to the receiver payment instrument 114.

[0060] Figure 5 illustrates exemplary screenshots 510, 520, and 530 of the banking or digital wallet app for performing the payment transaction in accordance with the method 400. In the screenshot 510 shown on the sender electronic device 108, the sender 104 (Lee Kwan who is based in Singapore) logs in to the app and initiates the payment transaction for paying to the receiver 106 (Anjali Aggarwal who is based in India). The sender 104 selects the sender payment instrument 112 from his multiple ones held at the bank and prepares the payment instructions. The screenshot 520 illustrates the payment instructions including the payment amount (in Indian rupees), sender identifier 120 associated with the selected sender payment instrument 112 (hidden from view), receiver identifier 122 (Anjali Aggarwal's email address), and message indicating the payment purpose (for wages). The receiver 106 may have a few receiver payment instruments 114 associated with the receiver identifier 122. The proxy platform on the server 102 determines the suitable receiver payment instrument 114 based on the payment instructions and receiver conditions. For example, the receiver 106 may set the conditions such that any payment for wages is sent to a business debit card. Identification data of the receiver payment instrument 114 is returned to the sender payment institution 116 which then processes the payment transaction in cooperation with the payment network 124.

[0061] Upon completion of the payment transaction and transfer of the payment amount from the sender payment instrument 112 to the receiver payment instrument 114, the receiver 106 receives a message on the receiver electronic device 110 informing the receiver 106 that the payment amount has been credited to the business debit card, as shown in the screenshot 530. The sender 104 may similarly receive a message on the sender electronic device 108 informing the sender 104 that the payment amount has been debited from the sender payment instrument 112. The

messages may be in the form of alerts / notifications appearing on the banking or digital wallet app, and/or in the form of text messages such as via SMS.

[0062] In some embodiments with reference to Figure 6, there is a computer-implemented or computerized method 600 implemented on the system 100 for identifying payment instruments 112 / 114 for a payment transaction between the sender 104 and the receiver 106. The method 600 relates to an exemplary use case for a payment transaction initiated from a non-payment-related app, such as a neutral / payment-agnostic communication app.

[0063] Notably in the method 400, the payment transaction is initiated in a known payment environment wherein the sender payment instrument 112 is known without having the proxy platform resolve the sender identifier 120. However in the method 600, the sender 104 initiates the payment transaction from a neutral / payment-agnostic environment wherein the sender payment institution 116 for the sender payment instrument 112 may not be known yet. Nevertheless, it will be appreciated that there are some aspects of the method 400 which will apply similarly or analogously to the method 600, and vice versa, and will not be further described in the method 600 for purpose of brevity.

[0064] In a step 602 of the method 600, the sender 104 executes the payment-agnostic communication app, such as a messaging or email app, installed on the sender electronic device 108, or accesses an online communication platform, such as an online email interface. In a step 604, the sender 104 writes a communication message on the communication app / platform to the receiver 106, the communication message related to making payment to the receiver 106. In a step 606, the communication app / platform recognizes the communication message is intended to initiate a payment transaction with the receiver 106, such as based on predefined keywords written in the communication message.

[0065] In a step 608, the communication app / platform communicates, to the server 102, the payment instructions including the payment amount, sender identifier 120, and receiver identifier 122 extracted from the communication message. For example,

the email server or messaging server communicates the payment instructions to the proxy platform on the server 102 in response to detecting the communication message is sent. In a step 610, the proxy platform identifies the sender payment instrument 112 associated with the sender identifier 120 as well as the receiver payment instrument 114 associated with the receiver identifier 122. The proxy platform may determine the sender payment instrument 112 and receiver payment instrument 114 from a plurality of sender payment instruments 112 and a plurality of receiver payment instruments 114, respectively, based on the payment instructions and sender conditions and receiver conditions, respectively, in a similar manner as described in the method 400.

[0066] In a step 612, the server 102 communicates, to the sender payment institution 116, the payment instructions including the payment amount, identification data of the sender payment instrument 112, and identification data of the receiver payment instrument 114. In some embodiments, the sender 104 may be requested to verify the payment instructions including whether the sender payment instrument 112 is the correct one to be used for the payment transaction. For example, the server 102 returns the payment instructions including the identification data of the sender payment instrument 112 to the sender electronic device 108 via the communication app / platform. The server 102 waits to receive verification by the sender 104 before communicating the payment instructions to the sender payment institution 116.

[0067] In a step 614, the sender payment institution 116 processes the payment transaction based on the payment instructions in cooperation with the payment network 124 and the receiver payment institution 118. It will be appreciated that the payment transaction is processed as described above in the method 400. For example, steps 616 and 618 relate to messages informing the sender 104 and receiver 106, respectively, that the payment transaction has been successfully processed.

[0068] Figure 7 illustrates exemplary screenshots 710, 720, and 730 of the communication app for performing the payment transaction in accordance with the method 600. In the screenshot 710 shown on the sender electronic device 108, the sender 104 (Lee Kwan) writes a communication message to the receiver 106 (Anjali Aggarwal) about paying him for wages. The communication app recognizes the

communication message is intended to initiate a payment transaction with the receiver 106, such as based on the keywords “sending”, “wages”, and currency code “INR” written in the communication message. The communication app may cooperate with the proxy platform to identify the sender payment instrument 112 based on the sender identifier 120, such as the sender phone number or email address used in the communication app.

[0069] In some embodiments, the sender 104 may be asked to verify the payment instructions, as mentioned in the step 612. Specifically, when the server 102 returns the payment instructions including identification data of the sender payment instrument 112 to the sender electronic device 108, the communication app may trigger launch of a banking app on the sender electronic device 108, wherein this banking app is provided by the sender payment institution 116 for the sender payment instrument 112. The banking app displays the payment instructions as shown in the screenshot 720. Similar to the screenshot 520, the screenshot 820 illustrates the payment instructions including the payment amount, receiver identifier 122, and payment purpose. The sender 104 is requested to verify the payment instructions before the server 102 sends the payment instructions to the sender payment institution 116 for processing the payment transaction.

[0070] Upon completion of the payment transaction, the receiver 106 receives a message on the receiver electronic device 110 informing the receiver 106 that the payment amount has been credited to the receiver payment instrument 114, as shown in the screenshot 730. The sender 104 may likewise receive a similar message on the sender electronic device 108.

[0071] As described in the methods 400 and 600 above, the proxy platform operated on the server 102 is configured to identify the sender payment instrument 112 and receiver payment instrument 114 based on the sender identifier 120 and receiver identifier 122. Thus, for the sender 104 to pay to the receiver 106, the receiver 106 only needs to give the receiver identifier 122 to the sender without the need to share any sensitive information. Use of the identifiers 120 / 122 simplifies the payment

transaction and the payment transaction can be processed more efficiently, allowing the receiver 106 to more quickly receive the payment.

[0072] The payment transaction is processed by the sender payment institution 116 and receiver payment institution 118 across the payment network 124 for transferring the payment amount from the sender payment instrument 112 to the receiver payment instrument 114. The payment network 124 is a payment rail for moving money from the sender payment instrument 112 to the receiver payment instrument 114. Some common payment rails include card rails (e.g. Mastercard Banknet) for card-to-card payments, ACH rails (e.g. FAST) for account-to-account payments, or other rails like Mastercard Send for account-to-card payments and PromptPay for digital wallet payments.

[0073] In some embodiments, as the sender payment institution 116 knows the payment instruments 112 and 114 and receiver payment institutions 118, a common payment network 124 or payment rail can be identified for processing the payment transaction. For example, if the payment instruments 112 and 114 are bank accounts, the payment is moved through FAST. If the payment instruments 112 and 114 are Mastercard cards, the payment is moved through Mastercard. If the sender payment instrument 112 is a bank account and the receiver payment instrument 114 is a Mastercard card, or vice versa, the payment is moved through Mastercard Send. It will be appreciated that the payment institutions 116 and 118 are connected to the same payment network 124 to process the payment transaction. However, it is common that each payment institution 116 / 118 is connected to a few different payment networks 124 at the same time. For example, a bank may be part of the Mastercard Banknet and FASH ACH rails. A suitable or common payment network 124 is identified from these payment networks 124 for processing the payment transaction across the payment institutions 116 / 118.

[0074] In some embodiments, the sender payment instrument 112 and sender payment institution 116 are connected to a first payment network 124a, and the receiver payment instrument 114 and receiver payment institution 118 are connected to a second payment network 124b. The first and second payment networks 124ab

are different from each other. For example, the first payment network 124a is for payments on the digital wallet from a first merchant (e.g. a coffeehouse retail chain) and the second payment network 124b is for payments on the digital wallet from a second merchant (e.g. a service aggregator). However, both payment networks 124ab may be connected to a third payment network 124c, such as the Unified Payments Interface (UPI) in India. The third payment network 124c is typically a wider and more open-loop payment network that may enable processing of payment transactions across different payment rails and different payment institutions, particularly of non-bank entities or closed-loop digital wallets but may also include banks and other bank-like entities.

[0075] Thus, if the sender payment instrument 112 and receiver payment instrument 114 are operating on different payment networks 124, it may be possible for the payment networks 124 to communicate with one another, thereby allowing the payment transaction to be quickly processed. The payment transaction can be effected simply by sharing the user identifiers 120 / 122. For example, the receiver 106 can share his user identifier 122 on his digital wallet with the sender 104, and the sender 104 would be able to make payment to the receiver 106, even if the sender payment instrument 112 is different, such as a credit card or a digital wallet from another merchant.

[0076] While various embodiments herein describe P2P payment transactions, such as between individual consumers, other forms of payment transactions involving the user identifiers from the proxy platform can be performed as well, such as person-to-business (P2B), business-to-business (B2B), person-to-government (P2G), or business-to-government (B2G) transactions and the like. It will be appreciated that uses of the proxy platform can be expanded to include all types of payment transactions between any pair of users or any pair of entities. For example, an individual person or a business organization can make monthly rent payments to the landlord (another person or business organization) using the receiver identifier 122 of the landlord. An individual person may similarly pay taxes to a government organization or tax authority using the receiver identifier 122 thereof. Use of the proxy

platform for payments can result in different advantages for different users 104 / 106 depending on their profiles, as described below.

[0077] A user may be a millennial student who is unemployed, and who is savvy with mobile financial services and owns multiple digital wallets. The proxy platform provides the student with an easy way to send money to her similarly digitally savvy friends, influencers, and retailers by citing their social media handles. She would also be able to maximize her savings balance by routing all received payments above a threshold, e.g. \$50, to a savings account, with smaller amounts diverted to other payment instruments such as a petty cash account.

[0078] A user may be a business traveler who has many bank accounts in different countries and many credit cards billed in different currencies. The proxy platform provides the business traveler with an easy way to send and receive money internationally, i.e. cross-border payments, for various purposes such as for P2P or P2B transactions. Being a frequent traveler who receives money frequently in different currencies, he may be able to save on foreign exchange fees by diverting all incoming non-local currency payments to a multi-currency wallet or an international bank account.

[0079] A user may be a freelancer working in a gig economy doing freelance work. The freelancer may have many credit cards and digital wallets, and the proxy platform provides her with an easy way to receive money for the freelance work. She can route freelance payments, such as based on the keyword “freelance”, to a savings account. Smaller sums of incoming payments may be routed to a digital wallet to maintain a small money float for spending and earning loyalty points.

[0080] A user may be a SME that wants to manage and optimize cash flow but has small bandwidth to manage payments. The proxy platform provides the SME with a convenient and cheap way to send and receive payments, such as to suppliers and from customers, as well as with a cheap way to reconcile such payments. Cash flow can be optimized by linking multiple accounts to one user identifier so that if payment fails in one account, the user identifier can fall back to the next linked account.

[0081] A user may be a MNC that has the resources to optimize cash flow based on credit terms, and has multiple bank accounts for different purposes. The proxy platform provides the MNC with a convenient way to send and route money to and from multiple accounts based on the predefined conditions and other data such as payment patterns (e.g. payroll). Finance processes of the SME can be streamlined and treasury liquidity optimized by setting suitable conditions for routing payments to and from various payment instruments.

[0082] A user may be a government organization that receives and disburses payments to a large population across various consumer and commercial segments. The proxy platform provides the government organization with a convenient to send the disbursements to the consumers and corporations directly, minimizing use of a middleman and errors in payment transfers. For example, one user identifier may be linked to multiple accounts so that if there are insufficient funds in one account or the account is closed, the user identifier can fall back to the next linked account.

[0083] As described in various embodiments herein, the proxy platform associates or maps user identifiers or proxies like phone numbers and email addresses to payment instruments like bank accounts and credit cards. Each user identifier can be mapped to one or more payment instruments, and each payment instrument can be mapped to one or more user identifiers. Payment transactions can be effected using the user identifiers based on predefined conditions of the users that determine which payment instruments associated with the user identifiers are used for the payment transactions. The payment transactions are processed and across one or more payment networks, allowing for both domestic payments and international cross-border payments. Connection of different payment networks to a broader open-loop payment network allow payment transactions involving payment instruments on different payment networks to still be processed. This is advantageous for closed-loop digital wallets that run on their own payment networks. Specifically, integration of the proxy platform with closed-loop digital wallets expands their payment capabilities to open-loop payments, since payments can be made to other payment instruments on other payment networks. As exemplified in various use cases above, the proxy platform is suitable

for use with different types of users, including but not limited to individual consumers, SME / MNC organizations, and government entities. There is potential commercial adoption of the proxy platform across mature and emerging markets across multiple and different payment networks or rails.

Technical Architecture

[0084] In some embodiments, the computer system 102 is a server 102 based on a centralized model wherein the proxy platform is hosted centrally on the server 102. In some embodiments, the server 102 is based on a decentralized model wherein respective payment institutions store data on the associations of user identifiers and payment instruments of their customers. Particularly, a sender payment institution operates a proxy platform to resolve the sender payment instrument based on the sender identifier, while a receiver payment institution operates a proxy platform to resolve the receiver payment instrument based on the receiver identifier. In some embodiments, the server 102 is based on a hybrid model, i.e. a combination of elements from both the centralized and decentralized models. For example, larger payment institutions may control their own proxy platforms while smaller payment institutions may subscribe to a centralized proxy platform.

[0085] As used herein, a server is a physical or cloud data processing system on which a server program runs. The server may be implemented in hardware or software, or a combination thereof. Some non-limiting examples of the server 102 include computers, laptops, mini-computers, mainframe computers, any non-transient and tangible machines that can execute a machine-readable code, cloud-based servers, distributed server networks, and a network of computer systems. Figure 8 is a block diagram illustrating a technical architecture 800 of the server 102.

[0086] The technical architecture 800 includes a processor 802 (also referred to as a central processor unit or CPU) that is in communication with memory devices including secondary storage 804 (such as disk drives or memory cards), read-only memory (ROM) 806, and random-access memory (RAM) 808. The processor 802 may be implemented as one or more CPU chips. Various modules or components for

performing various steps of the methods 200 / 300 / 400 / 600 are configured as part of the processor 802 and such steps are performed in response to non-transitory instructions operative or executed by the processor 802. The processor 802 includes suitable logic, circuitry, and/or interfaces to execute such steps. Some non-limiting examples of the processor 802 include an application-specific integrated circuit (ASIC) processor, a reduced instruction set computing (RISC) processor, a complex instruction set computing (CISC) processor, a field-programmable gate array (FPGA), and the like.

[0087] The technical architecture 800 further includes input/output (I/O) devices 810, and system connectivity / network devices 812. The secondary storage 804 typically includes one or more memory cards, disk drives, tape drives, or other storage devices and is used for non-volatile storage of data and as an over-flow data storage device if RAM 808 is not large enough to hold all working data. Secondary storage 804 may be used to store programs which are loaded into RAM 808 when such programs are selected for execution.

[0088] The secondary storage 804 has a processing component 814 including non-transitory instructions operative by the processor 802 to perform various steps of the methods 200 / 300 / 400 / 600 according to various embodiments of the present disclosure. The ROM 806 is used to store instructions and perhaps data which are read during program execution. The secondary storage 804, the ROM 806, and/or the RAM 808 may be referred to in some contexts as computer-readable storage media and/or non-transitory computer-readable media. Non-transitory computer-readable media include all computer-readable media, with the sole exception being a transitory propagating signal per se.

[0089] The I/O devices 810 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, and/or other known input devices.

[0090] The system connectivity / network devices 812 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 communication (NFC), radio frequency identity (RFID), and/or other air interface protocol radio transceiver cards, and other known system connectivity / network devices. These system connectivity / network devices 812 may enable the processor 802 to communicate with the Internet or one or more intranets. With such a system / network connection, it is contemplated that the processor 802 might receive information from the network, or might output information to the network in the course of performing the steps of the methods 200 / 300 / 400 / 600. Such information, which is often represented as a sequence of instructions to be executed using processor 802, may be received from and outputted to the network, for example, in the form of a computer data signal embodied in a carrier wave.

[0091] The processor 802 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 804), flash drive, ROM 806, RAM 808, or the system connectivity / network devices 812. While only one processor 802 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.

[0092] The technical architecture 800 may be formed by one computer, or multiple computers in communication with each other that collaborate to perform a task. For example, but not by way of limitation, an application may be partitioned in such a way as to permit concurrent and/or parallel processing of the instructions of the application. Alternatively, the data processed by the application may be partitioned in such a way as to permit concurrent and/or parallel processing of different portions of a data set by the multiple computers. In an embodiment, virtualization software may be employed

by the technical architecture 800 to provide the functionality of a number of servers that is not directly bound to the number of computers in the technical architecture 800. In an embodiment, the functionality disclosed above may be provided by executing the application and/or applications in a cloud computing environment. Cloud computing may include providing computing services via a system / network connection using dynamically scalable computing resources. A cloud computing environment may be established by an enterprise and/or may be hired on an as-needed basis from a third-party provider.

[0093] It is understood that by programming and/or loading executable instructions onto the technical architecture 800, at least one of the CPU 802, ROM 806, and RAM 808 are changed, transforming the technical architecture 800 in part into a specific purpose machine or apparatus having the functionality as taught by various embodiments of 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 known design rules.

[0094] Furthermore, various embodiments of the present disclosure 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 embodiments. For instance, various embodiments 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, or magnetic strips), optical discs (e.g. compact disc (CD), digital versatile disc (DVD), or Blu-ray disc), smart cards, flash memory devices (e.g. card, stick, or key drive), and solid state drives / memory devices.

[0095] In the foregoing detailed description, embodiments of the present disclosure in relation to an electronic system and computerized method for identifying payment

instruments for payment transactions are described with reference to the provided figures. The description of the various embodiments herein is not intended to call out or be limited only to specific or particular representations of the present disclosure, but merely to illustrate non-limiting examples of the present disclosure. The present disclosure serves to address at least one of the mentioned problems and issues associated with the prior art. Although only some embodiments of the present disclosure are disclosed herein, it will be apparent to a person having ordinary skill in the art in view of this disclosure that a variety of changes and/or modifications can be made to the disclosed embodiments without departing from the scope of the present disclosure. Therefore, the scope of the disclosure as well as the scope of the following claims is not limited to embodiments described herein.

Claims

1. A computerized method for identifying payment instruments for payment transactions, the method performed by a computer system and comprising:

receiving, from an electronic device of a first user, instructions for payment from the first user to a second user, the payment instructions comprising a payment amount and an identifier of the second user;

identifying a plurality of predefined payment instruments of the second user associated with the second user identifier;

determining a payment instrument of the second user from the plurality of predefined payment instruments of the second user based on the payment instructions and a set of conditions predefined by the second user; and

communicating, to a payment institution for a payment instrument of the first user, identification data of the second user payment instrument for processing a payment transaction based on the payment instructions in cooperation with at least one payment network,

wherein the payment amount is subsequently transferred from the first user payment instrument to the second user payment instrument upon completion of said processing of the payment transaction.

2. The method according to claim 1, wherein the payment instructions further comprise an identifier of the first user, the method further comprising:

identifying a plurality of predefined payment instruments of the first user associated with the first user identifier;

determining the first user payment instrument from the plurality of predefined payment instruments of the first user based on the payment instructions and a set of conditions predefined by the first user.

3. The method according to claim 1 or 2, further comprising communicating identification data of the first user payment instrument to the first user electronic device.

4. The method according to any one of claims 1 to 3, further comprising performing a registration process comprising:

receiving a registration request from an electronic device of the respective user, the registration request comprising:
a number of user identifiers of the user;
identification data of a number of payment instruments of the user;
and
the set of conditions predefined by the user;
associating each user identifier to at least one user payment instrument;
and
applying the set of conditions to the user payment instruments.

5. The method according to any one of claims 1 to 4, wherein the conditions are applied in a predefined order for determining the payment instruments for the respective user.

6. The method according to any one of claims 1 to 5, wherein the conditions enable a default payment instrument of the respective user to be determined.

7. The method according to any one of claims 1 to 6, wherein the conditions relate to at least one of payment amount, identifier, payment purpose, and payment currency.

8. The method according to any one of claims 1 to 7, wherein the payment instructions further comprise a message indicating a payment purpose.

9. The method according to any one of claims 1 to 8, wherein each user identifier comprises one of email address, phone number, social media handle, and organization name.

10. The method according to any one of claims 1 to 9, further comprising communicating an error message to the first user electronic device in response to failure to determine the first and/or second user payment instrument.

11. A computer system for identifying payment instruments for payment transactions, the computer system comprising:

a communication module configured for receiving, from an electronic device of a first user, instructions for payment from the first user to a second user, the payment instructions comprising a payment amount and an identifier of the second user;

an identification module configured for identifying a plurality of predefined payment instruments of the second user associated with the second user identifier;

a determination module configured for determining a payment instrument of the second user from the plurality of predefined payment instruments of the second user based on the payment instructions and a set of conditions predefined by the second user; and

the communication module further configured for communicating, to a payment institution for a payment instrument of the first user, identification data of the second user payment instrument for processing a payment transaction based on the payment instructions in cooperation with at least one payment network,

wherein the payment amount is subsequently transferred from the first user payment instrument to the second user payment instrument upon completion of said processing of the payment transaction.

12. The computer system according to claim 11, wherein the payment instructions further comprise an identifier of the first user,

the identification module further configured for identifying a plurality of predefined payment instruments of the first user associated with the first user identifier; and

the determination module further configured for determining the first user payment instrument from the plurality of predefined payment instruments of the first user based on the payment instructions and a set of conditions predefined by the first user.

13. The computer system according to claim 11 or 12, wherein the communication module is further configured for communicating identification data of the first user payment instrument to the first user electronic device.

14. The computer system according to any one of claims 11 to 13, further comprising a registration module configured for performing a registration process comprising:

receiving, from an electronic device of the respective user, a registration request comprising:

a number of user identifiers of the user;

identification data of a number of payment instruments of the user;

and

the set of conditions predefined by the user;

associating each user identifier to at least one user payment instrument;

and

applying the set of conditions to the user payment instruments.

15. The computer system according to any one of claims 11 to 14, wherein the conditions are applied in a predefined order for determining the payment instruments for the respective user.

16. The computer system according to any one of claims 11 to 15, wherein the conditions enable a default payment instrument of the respective user to be determined.

17. The computer system according to any one of claims 11 to 16, wherein the conditions relate to at least one of payment amount, identifier, payment purpose, and payment currency.

18. The computer system according to any one of claims 11 to 17, wherein the payment instructions further comprise a message indicating a payment purpose.

19. The computer system according to any one of claims 11 to 18, wherein the second user identifier is unique to the first user.

20. A non-transitory computer-readable storage medium storing computer-readable instructions that, when executed, cause a computer system to perform the method according to any one of claims 1 to 10.