Computer systems and computer-implemented methods for electronic wallet transactions

Field of the invention

[0001] The present invention relates to computer systems and methods for electronic wallet transactions, in particular, for carrying out payment transactions using a plurality of electronic wallets.

Background of the invention

[0002] Use of electronic wallets (e-wallets) is on the rise due to the convenience it brings to consumers. In particular, utilizing e-wallets reduces the need to obtain and secure cash, thereby speeding up transactions and enhancing consumers' shopping experience.

[0003] Nonetheless, e-wallets are generally provided by different e-wallet service providers (e.g. financial technology companies, banks, financial institutions etc.) and are not interoperable. As such, the acceptance of an individual e-wallet as a payment method by a merchant in a transaction is highly dependent on whether the individual e-wallet is supported by the merchant (i.e. whether the merchant also has an account with the same e-wallet service provider as the consumer).

[0004] To secure a competitive advantage, merchants may sign up for the use of multiple e-wallets provided by different e-wallet service providers so as to bring multiple e-wallet payment options to consumers. However, this leads to administrative issues and introduces other inconveniences to the merchants as the multiple e-wallet accounts make it extremely difficult for them to manage their consolidated cash positions at the end of each day.

[0005] It is therefore an aim of the present invention to provide computer systems and methods to ameliorate some or all of the aforementioned problems.

Summary of the invention

[0006] The present invention aims to provide new and useful computer systems and methods performed by computers and computer systems as defined in the claims.

Brief description of the drawings

[0007] Non-limiting embodiments of the invention will now be described for the sake of example only, with reference to the following drawings in which:

Fig. 1 shows a computerised network which is a first embodiment of the invention;

Fig. 2 shows an exemplary embodiment of the computerized network of Fig. 1;

Fig. 3 shows the steps of a method which is an embodiment of the invention and which may be performed by a universal wallet server comprised in the computerised network of Fig. 1;

Fig. 4 shows additional steps of a method which may be performed by the universal wallet server of Fig. 1 in accordance with an embodiment of the invention;

Fig. 5 shows additional steps to the method of Fig. 4 which may be performed by the universal wallet server in accordance with an embodiment of the invention;

Fig. 6 shows an additional determining step for the method of Fig. 3 which may be performed by the universal wallet server in accordance with an embodiment of the invention;

Fig. 7 shows schematically the structure of a merchant computer apparatus which may be used in the computerised network of Fig. 1 in accordance with an embodiment of the invention;

Fig. 8 shows schematically the structure of a server which may be used in the computerised network of Fig. 1 to implement a method which is an embodiment of the invention; and

Fig. 9 shows schematically the structure of the universal wallet server which may be used in the computerised network of Fig. 1 to carry out the methods of Figs. 3 to 6 in accordance with embodiments of the invention.

Detailed description of the embodiment

[0008] As used in this document, the term "electronic wallet" refers to any electronic 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 "electronic wallet" may exist as application-based stored value accounts associated with an electronic wallet service provider tied in with an issuing institution.

[0009] As used in this application, 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 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. One or more components 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.

[0010] 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 . . .).

[0011] In general terms, the present invention proposes a computerised network for carrying out payment transactions using a plurality of electronic wallets. The computerised network comprises at least one merchant computer apparatus, a database and a universal wallet server. The merchant computer apparatus is configured to accept payment transactions using the plurality of electronic wallets, to receive transaction details of each of the payment transactions, and to transmit a transaction request for each of the payment transactions to the universal wallet server. The transaction details identify at least one of the plurality of electronic wallets of a consumer, an electronic wallet service provider associated with the at least one of the plurality of electronic wallets, and a payment amount; and the transaction request comprises the transaction details and a merchant identifier associated with each merchant computer apparatus. The database of the computerised network is configured to associate issuing institutions with the plurality of electronic wallet service providers. In addition, the universal wallet server is configured to receive details of the transaction request from the merchant computer apparatus, to query the database to identify an issuing institution for the electronic wallet service provider, to transmit an authorisation request to the respective issuing institution to seek authorization for each of the payment transactions, to receive an authorisation response from the issuing institution where the authorisation response comprises an approval or a refusal of the transaction request, and to transmit a transaction response from the issuing institutions to the merchant computer apparatus where the transaction response comprises the approval or the refusal of the transaction request.

[0012] In order to process payment transactions from the plurality of electronic wallets, the merchant computer apparatus comprises an input terminal which is configured to accept payment transactions using the plurality of electronic wallets. Transaction details for each of the payment transactions identifying at least an electronic wallet of a consumer and an electronic wallet service provider associated with the electronic wallet are then transmitted to the universal wallet server. Based on the transaction details, the universal wallet server can query the database to identify an issuing institution for the electronic wallet service provider and communicate with the issuing institution for the processing of the payment transaction.

[0013] Whereas the acceptance of an individual electronic wallet as a payment method was highly dependent on whether the merchant computer apparatus has registered with the electronic wallet service provider of the individual electronic wallet previously, embodiments of the present invention provide a universal wallet server as a centralized platform through which the merchant computer apparatus can communicate with the electronic wallet service providers, thereby allowing payment transactions using a plurality of electronic wallets associated with the electronic wallet service providers to be accepted at the merchant computer apparatus.

[0014] In this way, the computerised network provides a solution to allow payment transactions using a plurality of electronic wallets to be processed by the merchant computer apparatus without requiring the merchant computer apparatus to have registered with the different electronic wallet service providers, thereby reducing administrative costs for the merchants in processing payment transactions using the plurality of electronic wallets.

[0015] Moreover, the universal wallet server allows merchants to effectively register with a plurality of electronic wallet service providers centrally. Any merchant computer apparatus with access to the universal wallet server would be able to accept payment transactions of an electronic wallet so long as the electronic wallet service provider associated with the electronic wallet has registered with the universal wallet server. The use of the universal wallet server thus reduces administrative costs for both the merchants and the electronic wallet service providers since payment transactions can be processed in a centralized way. At the same time, there are incentives for electronic wallet service providers to register with the database through the universal wallet server so that they can promote their services through any merchant computer apparatus that may be associated with the universal wallet server. Consequently, the universal wallet server allows payment to be made by the consumers through one of a multitude of different electronic wallets at the merchant

computer apparatus, thereby improving convenience for the consumers as more payment options are made available.

[0016] Furthermore, since the universal wallet server acts as a centralized platform, it may also be configured to sort and consolidate settled payment transactions for the merchants such that it reduces the administrative costs for the merchants and allow them to consolidate their cash positions within a predetermined period of time, more easily.

[0017] Other desirable features and characteristics will become apparent from the subsequent detailed description and the appended claims, taken in conjunction with the accompanying drawings of the disclosure.

[0018] Referring to Fig. 1, a computerised network 100 which is an embodiment of the invention is shown. The computerised network 100 is a form of a payment network. The computerised network 100 comprises a universal wallet server 108 which facilitates an electronic payment transaction between a consumer (e.g. an account holder of an electronic wallet) and a merchant which receives the funds. In addition to functioning as a conventional payment network server (e.g. to process credit card payments), the universal wallet server 108 is also able to process payment transactions using a plurality of electronic wallets. In particular, the universal wallet server 108 is in communication with multiple issuing institution servers 110 and with an acquiring institution server 106. The issuing institution servers 110 are operated by issuing institutions associated with a plurality of electronic wallet service providers, the plurality of electronic wallet service providers being entities which make available a plurality of electronic wallets for payment transactions. The acquiring institution server 106 is operated by an acquiring institution at which the merchant maintains an account to receive funds. In an embodiment, the universal wallet server 108 is configured also to communicate directly with a consumer device 102 and/or a merchant computer apparatus 104. As will be understood by a skilled person in the art, the universal wallet server 108 may be constituted by a payment processing organization such as MasterCard, having suitable processing apparatus. It will be also understood that although only one acquiring institution server 106 is shown in Fig. 1, a plurality of acquiring institution servers 106 operated by respective acquiring institutions may also form part of the computerised network 100. Similarly, a plurality of consumer devices 102 and/or a plurality of merchant computer apparatus 104 may also form part of the computerised network 100 although only one consumer device 102 and only one merchant computer apparatus 104 are shown in Fig. 1. Note that the term "institution" is used here 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 issue payment cards associated with financial accounts. In an embodiment,

the issuing or acquiring institution can be one of the following: a bank, a financial technology company, or a financial institution.

[0019] Referring to Fig. 2 in combination with Fig. 1, an exemplary embodiment of the computerized network is shown. Typically, when a consumer is in a retail location associated with a given merchant (e.g. a shop operated by the merchant), the consumer can go to the merchant computer apparatus 104 operated by the merchant to make a purchase of a product. Note that the term "product" is used in this document to include any of physical objects, data products (such as music or software) or services, in addition to a dictionary meaning of the term "product". The merchant computer apparatus 104 may comprise a point-of-sale (POS) terminal. The POS terminal may be configured to interact with a consumer device 102 connected to the computerised network 100 as shown in Fig. 1. Details of the merchant computer apparatus 104 are discussed further in conjunction with Fig. 7.

[0020] In order to conclude a purchase, the consumer is prompted to make payment. A payment transaction can be initiated in a process 202 at the POS terminal of the merchant computer apparatus 104, by the consumer via the consumer device 102. In an embodiment, the consumer chooses to pay for the purchase using one of a plurality of electronic wallets via the consumer device 102, for example using Idea Money™ as shown in Fig. 2. The consumer device 102 may be a mobile phone, a personal computer, a tablet, a laptop, a key-fob or a personal digital assistant (PDA). The consumer device 102 may be installed with an application ("App"), the application being configured to be used for payment transactions with at least one electronic wallet. In an embodiment, the consumer is provided with an option to select at least one of the plurality of electronic wallets for a payment transaction on the App. The App may then communicate with the merchant computer apparatus 104 for the processing of the payment transaction. In an embodiment, a request for the payment transaction initiated in the process 202 comprises transaction details identifying at least one of the plurality of electronic wallets of the consumer, an electronic wallet service provider associated with the electronic wallet (e.g. Idea Money™) and a payment amount associated with the payment transaction. It will be understood that there is no limit as to the maximum or minimum number of electronic wallets associated with the App in order for the proposed method and/or system to work. For example, the App may store one or more than 10 electronic wallets on the consumer device 102. Electronic wallets may be application-based stored value accounts accessible through the consumer device 102. Examples of such electronic wallets may include Airtel Money™, Idea Money™, Pockets™, Jio Money™, Citrus Pay™, CapitalOne Wallet™, Due™, Paytm™ and Vodafone M-Pesa™.

[0021] In an embodiment, the merchant computer apparatus 104, which is configured to process payment transactions of a plurality of electronic wallets, receives details of the electronic wallet and associated electronic wallet service provider from the consumer device 102. The merchant computer apparatus 104 may be configured to accept payment from selected electronic wallets since not all electronic wallet service providers may be registered with the universal wallet server 108. In an embodiment, the merchant computer apparatus 104 is configured to communicate with the universal wallet server 108 to identify the electronic wallet service providers who are registered. For example, Airtel Money™, Idea Money™ and Jio Money™ are registered with the universal wallet server 108 for use in transactions using a plurality of electronic wallets but Pockets™ is not. As such, the merchant computer apparatus 104 as shown in Fig. 2 is configured to accept payments from Idea Money™ but not from Pockets™ in this case. The details of the electronic wallet may be transmitted from the consumer device 102 to the merchant computer apparatus 104 wirelessly or contactlessly, for example using Near Field Communication (NFC) or other protocols. The merchant computer apparatus 104 then transmits a transaction request for the payment transaction to the universal wallet server 108. The transaction request comprises the transaction details as well as a merchant identifier associated with the merchant computer apparatus 104. In an embodiment, the transaction request also includes a payment type which identifies the type of payment vehicle used in the payment transaction. In this case, the payment type is 'electronic wallet'. In an embodiment, the merchant computer apparatus 104 is configured to communicate with the universal wallet server 108 via an acquiring institution server 106, the acquiring institution server 106 being associated with an acquiring institution which receives funds for the merchant. This is shown in Fig. 2 as a process 204 where the transaction request is transmitted from the merchant computer apparatus 104 to the acquiring institution server 106, and as a process 206 where the transaction request is subsequently transmitted form the acquiring institution server 106 to the universal wallet server 108. In some embodiments, the merchant computer apparatus 104 is configured to communicate with the universal wallet server 108 directly.

[0022] In an embodiment, where the merchant may not have a dedicated POS terminal for obtaining the details from the App to initiate a cashless payment transaction, the electronic payment transaction may be initiated by the consumer device 102 which is operable to communicate with the universal wallet server 108. For example, the details collected by the App of the consumer device 102 may further comprise the payment amount and an identity of the merchant. A transaction request comprising the transaction details may then be transmitted by the consumer device 102 to the universal wallet server 108 directly for the processing of the payment transaction.

[0023] Once the transaction request has been received at the universal wallet server 108, the universal wallet server 108 identifies an issuing institution for the electronic wallet service provider associated with the electronic wallet which is used for the payment transaction. This may be done through a process 208 where the universal wallet server 108 queries a database 114 which is operationally connected to the universal wallet server 108. The database 114 is configured to associate issuing institutions with a plurality of electronic wallet service providers, where information stored in the database 114 aids the universal wallet server 108 in identifying an issuing institution for the electronic wallet service provider. The information may be received by the database 114 when the electronic wallet service provider first registers with the universal wallet server 108. The identity of the issuing institution associated with the electronic wallet service provider is then transmitted from the database 114 to the universal wallet server 108 in a process 210. For example, Airtel Money™ is associated with HDFC Bank™, Idea Money™ is associated with Citi Bank™, JioMoney™ is associated with Kotak Mahindra Bank™, Citrus Pay™ is associated with ICICI Bank™, MobiKwik™ is associated with Citi Bank™ and mpurse™ is associated with RBL Bank™. In this example where Idea Money™ is used for the payment transaction, the universal wallet server 108 identifies Citi Bank™ as the issuing institution associated with Idea Money™. The universal wallet server 108 then directs the transaction request for the payment transaction to the issuing institution server 110 of Citi Bank™ to be processed.

[0024] An authorisation request seeking an approval for the payment transaction is transmitted to the issuing institution server 110 of the issuing institution for the electronic wallet service provider in a process 212 once the issuing institution is identified at the universal wallet server 108. In an embodiment, the issuing institution server 110 communicates the authorisation request to the electronic wallet service provider server 112 in a process 214. The electronic wallet service provider server 112 then identifies an electronic wallet account associated with the electronic wallet of the consumer to check if the electronic wallet account has enough balance for the payment transaction. The electronic wallet account may be associated with an issuing institution account at the issuing institution that is associated with the electronic wallet service provider. The issuing institution account may not be transparent to the consumer, and may only be used for settlements of the electronic wallet account by the electronic wallet service provider. Once the electronic wallet service provider server 112 determines that an account balance of the electronic wallet account is more than or equal to the payment amount for the payment transaction, the electronic wallet service provider server 112 communicates to the issuing institution server 110 to proceed with the payment transaction in a process 216. In an embodiment, the electronic wallet service provider then debits the payment amount from the electronic wallet account and parks this amount in a general ledger with the issuing institution.

[0025] The universal wallet server 108 in turn receives an authorisation response from the issuing institution server 110 in a process 218, the authorisation response comprising an approval or a refusal by the issuing institution to proceed with the transaction request. The universal wallet server 108 then transmits the approval or the refusal of the transaction request to the merchant computer apparatus 104 via the acquiring institution server 106 in the processes 220 and 222 shown in Fig. 2. In some embodiments, the approval or the refusal of the transaction request may be transmitted from the universal wallet server 108 directly to the merchant computer apparatus 104. In an embodiment where the merchant may not have a dedicated POS terminal for obtaining the transaction details from the App to initiate a cashless payment transaction, the approval or the refusal of the transaction request may be communicated directly to the consumer device 102. As shown in Fig. 2, once an authorisation response comprising the approval or refusal is received at the merchant computer apparatus 104 in the process 222, the authorisation response is transmitted to the consumer device 102 in a process 224, where the payment transaction is either completed and the consumer collects the product, or the consumer is notified that the payment transaction has been refused.

[0026] As will be understood by a skilled person, each of the various apparatuses in the computerised network 100 has a communication module such as a wireless interface for two-way communication between one and another via a communication network. The communication network could be any types of network, for example, virtual private network (VPN), the Internet, a local area and/or wide area network (LAN and/or WAN), and so on.

[0027] A method 300 carried out by the universal wallet server of the computerised network 100 is illustrated in Fig. 3.

[0028] Referring to Fig. 3, in a step 302, the universal wallet server 108 receives, from an acquiring institution for a merchant, a transaction request from the merchant computer apparatus 104 after the consumer initiates a payment transaction. The transaction request identifies the electronic wallet, a payment amount for the payment transaction, an electronic wallet service provider associated with the electronic wallet and a merchant identifier associated with the merchant computer apparatus 104. In an embodiment, the universal wallet server 108 transmits a verification request for the transaction request to the consumer device 102 upon receiving the transaction request from the merchant computer apparatus 104, where the verification request comprises the electronic wallet and the payment amount. The universal wallet server 108 then receives a verification response from the consumer device 102, indicating an approval or a refusal for the transaction request to proceed. In an embodiment, the verification request comprises an authentication request to authorize use of the electronic wallet for the payment transaction wherein the

authentication request comprises at least one of the following inputs from the consumer device 102: a personal identification number (PIN), a one-time password (OTP), a gesture (e.g. patterns of any sort which may be captured on the consumer device) or a biometric of the consumer. This advantageously improves security for payment transactions since a further verification and authentication processes are required from the consumer device 102 before the payment transaction is allowed to proceed.

[0029] In a step 304, the universal wallet server 108 queries the database 114 to identify an issuing institution for the electronic wallet service provider after the transaction request is received in the step 302, where the database 114 associates issuing institutions with a plurality of electronic wallet service providers.

[0030] The universal wallet server 108 then transmits an authorisation request to the issuing institution through the issuing institution server 110 in a step 306 once the issuing institution for the electronic wallet service provider associated with the payment transaction has been identified. The authorisation request is transmitted to the issuing institution to seek an approval by the issuing institution to authorise the transaction request.

[0031] In a step 308, the universal wallet server 108 receives an authorisation response from the issuing institution via the issuing institution server 110. The authorisation response comprises an approval or a refusal by the issuing institution to proceed with the transaction request. In an embodiment, the step 308 further comprises determining, via the issuing institution, if an account balance associated with the electronic wallet is more than or equal to the payment amount. The universal wallet server 108 then receives the authorisation response from the issuing institution comprising the approval by the issuing institution to proceed with the transaction request if it is determined that the account balance associated with the electronic wallet is more than or equal to the payment amount. If it is determined that the account balance associated with the electronic wallet is less than the payment amount, the transaction request is refused. In an embodiment, the consumer is then prompted to use another mode of payment for the payment transaction.

[0032] In a step 310, the universal wallet server 108 transmits a transaction response to the merchant computer apparatus 104 comprising an approval or a refusal of the transaction request once an authorisation response has been received at the universal wallet server 108 in the step 308.

[0033] In an embodiment, the above steps 302 to 310 are repeated for another payment transaction from the merchant computer apparatus 104 for another electronic wallet. The payment transaction may be carried out by either the same consumer device 102 or another consumer device 102. A skilled person in the art would understand that a plurality

of consumer devices 102 and a plurality of merchant computer apparatuses 104 may be operationally connected to the universal wallet server 108 to carry out transactions using a plurality of electronic wallets by the method 300 described in Fig. 3 above.

[0034] Fig. 4 shows additional steps of a method 400 which may be performed by the universal wallet server 108 of Fig. 1 in accordance with an embodiment of the invention. In particular, the method 400 as shown in Fig. 4 relates to a settlement and clearing process which may be implemented by the universal wallet server 108 of the computerised network 100 in Fig. 1. The universal wallet server 108 advantageously acts as a centralized platform for the settlement and clearing process to be carried out and reduces administrative costs for the merchants and the electronic wallet service providers. Moreover, the universal wallet server 108 is able to provide a consolidated cash position to the merchants within a predetermined period of time.

[0035] Referring to Fig. 4, in a step 402 of the method 400, the universal wallet server 108 receives a settlement transaction request from the merchant computer apparatus 104 for the merchant, the settlement transaction request comprising a list of payment transactions made by electronic wallets via the merchant computer apparatus 104 within a predetermined period of time. In an embodiment, the settlement transaction request is received from the merchant computer apparatus 104 from the acquiring institution server 106. The predetermined period of time may be decided by the merchant via the merchant computer apparatus 104, which may typically be a day, a week, a month or a year or any other period of time which may be deemed suitable by the merchant.

[0036] In a step 404, the universal wallet server 108 then sorts the settlement transaction request received in the step 402 by associating each of the payment transactions to a corresponding issuing institution associated with each electronic wallet service provider identified in each of the payment transactions.

[0037] In a step 406, the universal wallet server 108 transmits a settlement request to each of the corresponding issuing institutions for payment transactions associated with each of the corresponding issuing institutions made at the merchant computer apparatus 104, once the settlement transaction request is sorted in step 404.

[0038] In a step 408, the universal wallet server 108 receives a settlement response comprising funds to settle the payment transactions from each of the corresponding issuing institutions.

[0039] The universal wallet server 108 then transmits the funds to the acquiring institution via the acquiring institution server 106 in a step 410 once the settlement response has been received in step 408.

[0040] In a step 412, the universal wallet server 108 sends a settlement transaction response to the merchant computer apparatus 104 indicating that the list of payment transactions has been settled once the funds have been transmitted to the acquiring institution in step 410.

[0041] An illustration of the clearing and settlement process is described below. For example, the merchant has acquired the following payment transactions via the merchant computer apparatus 104 in a day:

a. Idea wallet™: 10 transactions with a total payment amount of $1000 (associated issuing institution is Citi Bank™);

b. Airtel wallet™: 20 transactions with a total payment amount of $2000 (associated issuing institution is HDFC Bank™); and

c. Citrus wallet™: 30 transactions with a total payment amount of $3000 (associated issuing institution is ICICI Bank™).

That is, the merchant has accepted $6000 of payment amount through payment transactions using different electronic wallets.

The merchant then submits the above list of payment transactions to an acquiring institution associated with the merchant. In this case, the list of 60 transactions is submitted to the acquiring institution for clearing and settlement. The acquiring institution then transmits the list of transactions and their details to the universal wallet server 108 as described in step 402, where the universal wallet server 108 carries out the steps of 404 to 408 in communication with the corresponding issuing institutions of the electronic wallet service providers. In this example, the universal wallet server 108 settles the transactions with the issuing institutions as shown below:

a. 10 transactions with Citi Bank™ (for Idea wallet™);

b. 20 transactions with HDFC Bank™ (for Airtel wallet™); and

c. 30 transactions with ICICI Bank™ (for Citrus wallet™).

The funds for the above 60 transactions are then transmitted from the universal wallet server 108 to the acquiring institution via the acquiring institution server 106. The acquiring bank which received the funds then settles the funds with a merchant account associated with the acquiring institution.

[0042] Fig. 5 shows additional steps which may be performed by the universal wallet server 108 of Fig. 1 in accordance with an embodiment of the invention. The method 500 may be

carried out by the universal wallet server 108 as further steps within the step 412 of method 400 in Fig. 4 to assist consolidation of settled payment transactions for a merchant.

[0043] In a step 502, the universal wallet server 108 consolidates settled payment transactions from each of the corresponding issuing institutions into a consolidated statement.

[0044] In a step 504, the universal wallet server 108 then sends the consolidated statement to the merchant computer apparatus 104 after the settled payment transactions have been consolidated. In an embodiment, the manner in which the settled payment transactions are consolidated is determined by the merchant via the merchant computer apparatus 104. The settled payment transactions may be consolidated every day, every week, every month or within every predetermined period of time. This advantageously assists the merchant in consolidating his/her business position. At the same time, a similar consolidated list of settled payment transactions may also be provided to each of the electronic wallet service providers associated with the universal wallet server 108 to assist them in keeping track of the use of their respective electronic wallets in payment transactions.

[0045] Fig. 6, shows an additional determining step which may be performed by the universal wallet server 108 in step 304 of Fig. 3 in accordance with an embodiment of the invention. In a step 602, the universal wallet server 108 determines if the electronic wallet service provider can be identified in the database 114. The electronic wallet service provider may be identified in the database 114 if it is registered with the database 114. The electronic wallet service provider may be registered with the database 114 by signing up with the universal wallet server 108. In an embodiment, if the universal wallet server 108 determines that the electronic wallet service provider can be identified in the database, it will carry out the steps 306 to 310 provided in Fig. 3 to process the payment transaction. If the universal wallet server 108 is unable to identify the electronic wallet service provider in the database 114, the universal wallet server 108 transmits a rejection response to the merchant computer apparatus 104 in accordance with a step 604. In an embodiment, the rejection response prompts the merchant computer apparatus 104 to request for another electronic wallet to be used for the payment transaction. In this case, the consumer may assign another one of the electronic wallets in the App installed on the consumer device 102 to be used for the payment transaction. The method 300 may then be repeated for the payment transaction associated with another electronic wallet.

[0046] Fig. 7 shows schematically the structure of a merchant computer apparatus 104 which may be used in the computerised network of Fig. 1 in an embodiment of the invention. The merchant computer apparatus 104 comprises a POS terminal 702, POS hardware(s) 704 and backend system(s) 706. A POS software 708 may be installed at least in the POS

hardware(s) 704 and the backend system(s) 706 to enable the merchant computer apparatus 104 to accept and process payment transactions using a plurality of electronic wallets.

[0047] The POS terminal 702 comprises at least one input terminal 710, at least one processor 712, and at least one communication interface 714.

[0048] The input terminal 710 is configured to receive details of the electronic wallet and associated electronic wallet service provider from a consumer device 102. In particular, the input terminal 710 is configured to be compatible with the App installed in the consumer device 102 to receive the details through a contactless means. The input terminal 710 may also be configured to accept payment transactions using a plurality of electronic wallets. Examples of a contactless means are radio-frequency identification (RFID) or near field communication (NFC). In an embodiment, the input terminal 710 is configured to receive transaction details of a payment transaction where the details identify an electronic wallet of a consumer and an electronic wallet service provider associated with the electronic wallet.

[0049] The processor 712 is operationally connected to a read only memory (ROM) and a random access memory (RAM), so that cooperatively, they are configured to process payment transactions received at the merchant computer apparatus 104. In an embodiment, the processor 712 is configured to obtain the details from the input terminal 710, to transmit a transaction request to the universal wallet server 108 where the transaction request comprises the details, a payment amount and a merchant identifier associated with the merchant computer apparatus, to receive a transaction response from the universal wallet server 108 where the transaction response comprises an approval or a refusal of the transaction request, and to create and store in a merchant database a record of the payment transactions comprising transaction details identifying at least the electronic wallet and the electronic wallet service provider associated with each payment transaction.

[0050] The communication interface 714 allows the POS terminal 702 to be operationally connected to the POS hardware(s) 704. In addition, the communication interface 714 may also operationally connect the merchant computer apparatus 104 to the acquiring institution server 106 and/or the universal wallet server 108 so that the merchant computer apparatus 104 may function as part of the computerised network 100 described in Fig. 1. In an embodiment, the communication interface 714 of the merchant computer apparatus 104 is configured to transmit the details, the payment amount of the payment transaction and the merchant identifier to the universal wallet server 108 to initiate a transaction request. Communications as described may be achieved through any wired or wireless means known to the skilled person in the art. Although it is shown in Fig. 7 that the processor 712

and the communication interface 714 resides in the POS terminal 702, they may also reside in the POS hardware(s) 704 or in other peripherals operationally connected to the merchant computer apparatus 104.

[0051] POS hardware(s) 704 may comprise an electronic cash register (ECR), a self-checkout unit or a fuel dispenser. The POS hardware(s) may be designed to take any form known to a skilled person in the art as long as it serves the purpose of facilitating a purchase transaction at a retail location associated with the merchant. The POS hardware(s) 704 may be operationally connected to the backend system(s) 706 of the merchant computer apparatus 104 through any wired or wireless means.

[0052] The backend system(s) 706 of the merchant computer apparatus 104 may comprise a secondary storage 716. The secondary storage 716 typically comprises one or more disk drives or tape drives and is used for non-volatile storage of data. The secondary storage 716 may also comprise a merchant database where the merchant database stores a record of the payment transactions comprising transaction details identifying at least the electronic wallet and the electronic wallet service provider associated with each payment transaction that has been carried out at the merchant computer apparatus 104.

[0053] In an embodiment, the POS software 708 operating the POS terminal 702 is enhanced such that payment transactions using a plurality of electronic wallets can be accepted by the merchant computer apparatus 104. The POS software 708 may be installed in the POS hardware(s) 704 and the backend system(s) 706, and may be enhanced by a software development kit (SDK). The SDK may have configurations to enable payments from a plurality of electronic wallets that are associated with a plurality of electronic wallet service providers. The configurations may be tied to whether each of the electronic wallet service providers has registered with the universal wallet server 108 to participate in the payment scheme as described in the methods of Figs. 3 to 6. Arrangements may also be made for each corresponding issuing institution of each of the electronic wallet service providers that has registered with the universal wallet server 108 to be registered with the database 114 so that payment transactions can be processed in accordance with the methods described.

[0054] Fig. 8 is a block diagram showing a technical architecture 800 of the issuing institution server 110 and/or the electronic wallet service provider server 112. The acquiring institution server 106 and/or the universal wallet server 108 may also have this technical architecture.

[0055] The technical architecture 800 includes a processor 802 (which may be referred to as a central processor unit or CPU) that is in communication with memory devices including secondary storage 804 (such as disk drives), read only memory (ROM) 806, random

access memory (RAM) 808. The processor 802 may be implemented as one or more CPU chips. The technical architecture may further comprise input/output (I/O) devices 810, and network connectivity devices 812.

[0056] The secondary storage 804 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 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.

[0057] In this embodiment, the secondary storage 804 has a processing component 804a comprising non-transitory instructions operative by the processor 802 to perform various operations of the method 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 RAM 808, and/or the ROM 806 may be referred to in some contexts as computer readable storage media and/or non-transitory computer readable media.

[0058] 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, or other well-known input devices.

[0059] The network connectivity 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 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 812 may enable the processor 812 to communicate with the Internet or one or more intranets. With such a 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 above-described method operations. 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.

[0060] 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 network connectivity 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.

[0061] Although the technical architecture is described with reference to a computer, it should be appreciated that the technical architecture may be formed by two or more 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 two or more 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 comprise providing computing services via a 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.

[0062] It is understood that by programming and/or loading executable instructions onto the technical architecture, at least one of the CPU 802, the RAM 808, and the ROM 806 are changed, transforming the technical architecture 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.

[0063] Fig. 9 shows schematically the structure 900 of the universal wallet server 108 comprised in the computerised network 100 of Fig. 1 to carry out the methods of Figs. 2 to 6 in accordance with embodiments of the invention. The structure 900 of the universal wallet server 108 comprises a communication module 902, a transaction module 904, a query module 906, an authorisation module 908, a verification module 910, a settlement module 912 and a registration module 914.

[0064] The communication module 902 is configured to enable the universal wallet server 108 to communicate with at least an acquiring institution server 106 and an issuing institution server 110 as provided in the computerised network 100 of Fig. 1. In some embodiments,

the communication module 902 is configured to enable the universal wallet server 108 to communicate with a merchant computer apparatus 104 and/or a consumer device 102 directly.

[0065] The transaction module 904 is configured to allow the universal wallet server 108 to process a transaction request. In particular, the transaction module 904 identifies and sorts the information in the transaction details for use in further processes (e.g. authorisation steps 306 and 308, and querying step 304 etc.). The transaction module 904 may transmit the relevant information isolated from the transaction request to other modules of the universal wallet server 108 for further processing.

[0066] The query module 906 is configured to communicate, via the communication module 902, with the database 114 to identify an issuing institution for the electronic wallet service provider associated with the electronic wallet used in the payment transaction. In other words, the query module 906 may be configured to carry out the processes 208 and 210 as shown in Fig. 2. The query module 906 may be further configured to determine if the electronic wallet service provider associated with the at least one of the plurality of electronic wallets used in the payment transaction can be identified in the database 114, and to transmit a rejection response, via the communication module 902, to the merchant computer apparatus 104 if it is determined that the electronic wallet service provider cannot be identified in the database 114. In some embodiments, the rejection response transmitted prompts the merchant computer apparatus 104 to request for another electronic wallet to be used for the payment transaction.

[0067] The authorisation module 908 is configured to communicate, via the communication module 902, with the issuing institution server 110 identified by the database 114 as being associated with the electronic wallet service provider for the payment transaction. In particular, the authorisation module 908 is configured to transmit an authorisation request to the issuing institution seeking an approval by the issuing institution to authorise the transaction request received at the transaction module 904, and to receive an authorisation response from the issuing institution comprising the approval or an refusal by the issuing institution to proceed with the transaction request.

[0068] The verification module 910 is configured to transmit, via the communication module 902, a verification request for the transaction request to the consumer device 102, where the verification request comprises at least one of the plurality of electronic wallets and a payment amount associated with the payment transaction. The verification module 910 is also configured to receive, via the communication module 902, a verification response from the consumer device 102 indicating an approval or a refusal for the transaction request to proceed.

[0069] The settlement module 912 is configured to receive a settlement transaction request from the merchant computer apparatus 104, where the settlement transaction request comprises a list of payment transactions made by electronic wallets via the merchant computer apparatus 104 within a predetermined period of time. After receiving the settlement transaction request, the settlement module 912 is configured to sort the settlement transaction request by associating each of the payment transactions to a corresponding issuing institution associated with each electronic wallet service provider identified in each of the payment transactions. The settlement module 912 may work with the query module 906 in tandem to determine the corresponding issuing institution associated with each of the payment transactions using the database 114. In an embodiment, the settlement module 912 is further configured to transmit, via the communication module 902, a settlement request to each of the corresponding issuing institutions for payment transactions associated with each of the corresponding issuing institutions made at the merchant computer apparatus 104. The settlement module 912 is configured to receive a settlement response comprising funds to settle the payment transactions from each of the corresponding issuing institutions, and to transmit the funds to the acquiring institution via the acquiring institution server 106 once the settlement response has been received. The settlement module 912 may also be configured to send a settlement transaction response to the merchant computer apparatus 104 indicating that the list of payment transactions has been settled once the funds have been transmitted to the acquiring institution. In an embodiment, the settlement module 912 is configured to consolidate settled payment transactions from each of the corresponding issuing institutions into a consolidated statement upon request from the merchant computer apparatus 104, and to transmit the consolidated statement to the merchant computer apparatus 104 after the settled payment transactions have been consolidated.

[0070] The registration module 914 is configured to register electronic wallet service providers with the database 114. In some embodiments, a request may be received from an electronic wallet service provider server 112 at the universal wallet server 108 to register an electronic wallet service provider associated with the electronic wallet service provider server 112 with the database 114. Upon receipt of the registration request, the registration module 914 may be configured to communicate, via the communication module 902, with the database 114 to register the electronic wallet service provider at the database 114.

[0071] In an embodiment, the universal wallet server 108 with the aforementioned architecture and structure 900 is configured to receive a transaction request associated with a payment transaction from a merchant computer apparatus 104, the transaction request identifying: at least one of the plurality of electronic wallets; a payment amount for the payment transaction; an electronic wallet service provider associated with the at least

one of the plurality of electronic wallets; and a merchant identifier associated with the merchant computer apparatus. The universal wallet server 108 may be further configured to query a database 114 to identify an issuing institution for the electronic wallet service provider where the database 114 associates issuing institutions to a plurality of the electronic wallet service providers. The universal wallet server 108 may also be configured to transmit an authorisation request to the issuing institution to seek an approval by the issuing institution to authorise the transaction request, to receive an authorisation response from the issuing institution where the authorisation response comprises the approval or a refusal by the issuing institution to proceed with the transaction request, and to transmit a transaction response to the merchant computer apparatus 104 where the transaction response comprises the approval or the refusal of the transaction request.

[0072] The universal wallet server 108 may be further configured to receive, from an acquiring institution for a merchant, a settlement transaction request from the merchant computer apparatus 104, where the settlement transaction request comprises a list of payment transactions made by electronic wallets via the merchant computer apparatus 104 within a predetermined time period. The universal wallet server 108 may also be further configured to sort the settlement transaction request by associating each of the payment transactions to a corresponding issuing institution associated with each electronic wallet service provider identified in each of the payment transactions, to transmit a settlement request to each of the corresponding issuing institutions for payment transactions associated with each of the corresponding issuing institutions made at the merchant computer apparatus 104, to receive a settlement response comprising funds to settle the payment transactions from each of the corresponding issuing institutions, to transmit the funds to the acquiring institution, and to send a settlement transaction response to the merchant computer apparatus 104 via the acquiring institution indicating that the list of payment transactions has been settled.

[0073] In an embodiment, the universal wallet server 108 is configured to consolidate settled payment transactions from each of the corresponding issuing institutions into a consolidated statement; and to send the consolidated statement to the merchant computer apparatus 104.

[0074] In an embodiment, the universal wallet server 108 is configured to determine if the electronic wallet service provider associated with the electronic wallet can be identified in the database 114 and to transmit a rejection response to the merchant computer apparatus 104 if it is determined that the electronic wallet service provider cannot be identified in the database 114.

[0075] In an embodiment, the universal wallet server 108 is further configured to transmit a verification request for the transaction request to the consumer device 102 where the verification request comprises the electronic wallet and a payment amount, and to receive a verification response from the consumer device 102 where the verification response indicating an approval or a refusal for the transaction request to proceed.

[0076] Advantageously, the universal wallet server 108 allows merchants to effectively register with a plurality of electronic wallet service providers centrally. Any merchant computer apparatus 104 with access to the universal wallet server 108 would be able to accept payment transactions of an electronic wallet so long as the electronic wallet service provider associated with the electronic wallet has registered with the universal wallet server 108. The use of the universal wallet server 108 thus reduces administrative costs for both the merchants and the electronic wallet service providers since payment transactions can be processed in a centralized way. At the same time, there are incentives for electronic wallet service providers to register with the database 114 through the universal wallet server 108 so that they can promote their services through any merchant computer apparatus 104 that may be associated with the universal wallet server 108. Consequently, the universal wallet server 108 allows payment to be made by the consumers through one of a multitude of different electronic wallets at the merchant computer apparatus 104, thereby improving convenience for the consumers as more payment options are made available.

[0077] Moreover, since the universal wallet server 108 is configured to sort and consolidate settled payment transactions for the merchants, it reduces the administrative costs for the merchants and allow them to consolidate their cash positions within a predetermined period of time, more easily.

[0078] 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 present 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 computerised network for carrying out payment transactions of a plurality of electronic wallets, the network comprising:

at least one merchant computer apparatus, each merchant computer apparatus configured to:

accept payment transactions using the plurality of electronic wallets;

receive transaction details of each of the payment transactions, the transaction details identifying at least one of the plurality of electronic wallets of a consumer, an electronic wallet service provider associated with the at least one of the plurality of electronic wallets, and a payment amount; and

transmit a transaction request for each of the payment transactions, the transaction request comprising the transaction details and a merchant identifier associated with each merchant computer apparatus;

a database configured to associate issuing institutions with a plurality of electronic wallet service providers; and

a universal wallet server, the universal wallet server configured to:

receive the transaction request;

query the database to identify an issuing institution for the electronic wallet service provider;

transmit an authorisation request to the issuing institution, the authorisation request seeking an approval by the issuing institution to authorise the transaction request;

receive an authorisation response from the issuing institution, the authorisation response comprising the approval or a refusal by the issuing institution to proceed with the transaction request; and

transmit a transaction response to the merchant computer apparatus, the transaction response comprising the approval or the refusal of the transaction request.

2. A merchant computer apparatus for processing payment transactions of a plurality of electronic wallets, the merchant computer apparatus comprising:

an input terminal for receiving transaction details of a payment transaction, the transaction details identifying an electronic wallet of a consumer and an electronic wallet service provider associated with the electronic wallet, wherein the input terminal is configured to accept payment transactions using a plurality of electronic wallets;

a communication interface for transmitting the transaction details and a payment amount to a universal wallet server to initiate a transaction request; and

a processor configured to:

obtain the transaction details from the input terminal;

transmit a transaction request to the universal wallet server, the transaction request comprising the transaction details and a merchant identifier associated with the merchant computer apparatus;

receive a transaction response from the universal wallet server, the transaction response comprising an approval or a refusal of the transaction request, wherein the universal wallet server is configured to query a database to identify an issuing institution for the electronic wallet service provider; and

create and store in a merchant database, a record of the payment transactions comprising transaction details identifying at least the electronic wallet and the electronic wallet service provider associated with each payment transaction.

3. The merchant computer apparatus of claim 2 configured as a point-of-sale terminal.

4. A universal wallet server for carrying out payment transactions of a plurality of electronic wallets, the universal wallet server comprising at least one processor configured to:

receive a transaction request associated with a payment transaction from a merchant computer apparatus, the transaction request identifying:

at least one of the plurality of electronic wallets;

a payment amount for the payment transaction;

an electronic wallet service provider associated with the at least one of the plurality of electronic wallets; and

a merchant identifier associated with the merchant computer apparatus;

query a database to identify an issuing institution for the electronic wallet service provider, the database associating issuing institutions to a plurality of the electronic wallet service providers;

transmit an authorisation request to the issuing institution, the authorisation request seeking an approval by the issuing institution to authorise the transaction request;

receive an authorisation response from the issuing institution, the authorisation response comprising the approval or a refusal by the issuing institution to proceed with the transaction request; and

transmit a transaction response to the merchant computer apparatus, the transaction response comprising the approval or the refusal of the transaction request.

5. The universal wallet server according to claim 4, wherein the at least one processor is further configured to:

receive, from an acquiring institution for a merchant, a settlement transaction request from the merchant computer apparatus, the settlement transaction request comprising a list of payment transactions made by electronic wallets via the merchant computer apparatus within a predetermined time period;

sort the settlement transaction request by associating each of the payment transactions to a corresponding issuing institution associated with each electronic wallet service provider identified in each of the payment transactions;

transmit a settlement request to each of the corresponding issuing institutions for payment transactions associated with each of the corresponding issuing institutions made at the merchant computer apparatus;

receive a settlement response comprising funds to settle the payment transactions from each of the corresponding issuing institutions;

transmit the funds to the acquiring institution; and

send a settlement transaction response to the merchant computer apparatus via the acquiring institution indicating that the list of payment transactions has been settled.

6. The universal wallet server according to claim 5, wherein the at least one processor is further configured to:

consolidate settled payment transactions from each of the corresponding issuing institutions into a consolidated statement; and

send the consolidated statement to the merchant computer apparatus.

7. The universal wallet server according to any one of claims 4 to 6, wherein the at least one processor is further configured to:

determine if the electronic wallet service provider associated with the at least one of the plurality of electronic wallets can be identified in the database, wherein the electronic wallet service provider can be identified in the database if the electronic wallet service provider is registered in the database; and

transmit a rejection response to the merchant computer apparatus if determined that the electronic wallet service provider cannot be identified in the database.

8. The universal wallet server according to any one of claims 4 to 7, wherein the at least one processor is further configured to:

transmit a verification request for the transaction request to a consumer device, the consumer device being associated with the at least one of the plurality of electronic wallets in the payment transaction, the verification request comprising the at least one of the plurality of electronic wallets and a payment amount; and

receive a verification response from the consumer device, the verification response indicating an approval or a refusal for the transaction request to proceed.

9. A computer-implemented method for carrying out payment transactions using a plurality of electronic wallets, the method being carried out at a universal wallet server and comprising:

receiving a transaction request associated with a payment transaction from a merchant computer apparatus, the transaction request identifying:

at least one of the plurality of electronic wallets;

a payment amount for the payment transaction;

an electronic wallet service provider associated with the at least one of the plurality of electronic wallets; and

a merchant identifier associated with the merchant computer apparatus;

querying a database to identify an issuing institution for the electronic wallet service provider, the database associating issuing institutions with a plurality of electronic wallet service providers;

transmitting an authorisation request to the issuing institution, the authorisation request seeking an approval by the issuing institution to authorise the transaction request;

receiving an authorisation response from the issuing institution, the authorisation response comprising the approval or a refusal by the issuing institution to proceed with the transaction request; and

transmitting a transaction response to the merchant computer apparatus, the transaction response comprising the approval or the refusal of the transaction request.

10. The method according to claim 9 further comprising:

receiving, from an acquiring institution for a merchant, a settlement transaction request from the merchant computer apparatus, the settlement request comprising a list of payment transactions made by electronic wallets via the merchant computer apparatus within a predetermined time period;

sorting the settlement transaction request by associating each of the payment transactions to a corresponding issuing institution associated with each electronic wallet service provider identified in each of the payment transactions;

transmitting a settlement request to each of the corresponding issuing institutions for payment transactions associated with each of the corresponding issuing institutions made at the merchant computer apparatus;

receiving a settlement response comprising funds to settle the payment transactions from each of the corresponding issuing institutions;

transmitting the funds to the acquiring institution; and

sending a settlement transaction response to the merchant computer apparatus via the acquiring institution indicating that the list of payment transactions has been settled.

11. The method according to claim 10, wherein the step of sending the settlement transaction response further comprises:

consolidating settled payment transactions from each of the corresponding issuing institutions into a consolidated statement; and

sending the consolidated statement to the merchant computer apparatus.

12. The method according to any one of claims 9 to 11, wherein the step of querying the database further comprises:

determining if the electronic wallet service provider associated with the at least one of the plurality of electronic wallets can be identified in the database, wherein the electronic wallet service provider can be identified in the database if the electronic wallet service provider is registered in the database; and

transmitting a rejection response to the merchant computer apparatus if it is determined that the electronic wallet service provider cannot be identified in the database.

13. The method according to any one of claims 9 to 12 further comprising:

transmitting a verification request for the transaction request to a consumer device, the consumer device being associated with the at least one of the plurality of electronic wallets in the payment transaction, the verification request comprising the at least one of the plurality of electronic wallets and a payment amount; and

receiving a verification response from the consumer device, the verification response indicating an approval or a refusal for the transaction request to proceed.

14. The method according to claim 13 wherein the verification request further comprises an authentication request to authorise use of the at least one of the plurality of electronic wallets for the payment transaction, the authentication request requiring at least one of the following inputs from the consumer device: a personal identification number (PIN), a one-time password (OTP), a gesture or a biometric.

15. The method according to any one of claims 9 to 14, wherein the step of receiving the authorisation response further comprising:

determining, via the issuing institution, if an account balance associated with the at least one of the plurality of electronic wallets is more than or equal to the payment amount;

receiving the authorisation response from the issuing institution, the authorisation response comprising the approval by the issuing institution to proceed

with the transaction request if it is determined that the account balance associated with the at least one of the plurality of electronic wallets is more than or equal to the payment amount.

16. The method according to any one of claims 9 to 15 wherein the step of receiving the transaction request is transmitted wirelessly.

17. The method according to any one of claims 9 to 16 wherein the issuing institution is one of the following: a bank, a financial technology company, or a financial institution.

18. The method according to any one of claims 9 to 17 further comprising repeating the steps of claim 8 for another payment transaction from the merchant computer apparatus for another one of the plurality of electronic wallets.

19. The method according to any one of claims 9 to 18 wherein the payment transactions carried out at the merchant computer apparatus are contactless transactions.

20. The method according to any one of claims 9 to 19 wherein the merchant computer apparatus comprises a point-of-sale terminal.

21. The method according to any one of claims 9 to 20 wherein the steps of receiving the transaction request and sending the transaction response are through an acquiring institution.