

SERVER AND METHOD FOR SHARING A DIGITAL WALLET FOR ELECTRONIC TRANSACTION

TECHNICAL FIELD

[0001] Various embodiments relate to a server and a method for sharing a digital wallet for an electronic transaction.

BACKGROUND

[0002] A digital wallet (also known as an “e-wallet”) may be a software program or an electronic device which allows one party to make electronic transactions with another party bartering digital currency units for goods and/or services. With the increasing shift to cashless transactions and surging consumer demands for digital services, there may be a growing need for use of digital wallets.

[0003] However, there may be various problems in gaining a larger user base and driving more use in a sustainable manner. For example, some people or entities (for example, minors, students, employees, financially insecure or dependent consumers, or others lacking sufficient credit history and/or permanent income) may have limited purchasing power to spend or use the digital wallet. In addition, some people such as minors and students may typically receive an allowance in cash from their parents as a means to manage their spending.

[0004] Conventionally, there has been a peer-to-peer (P2P) money transfer technology to supplement those with low purchasing power. However, recipients may have to comply with some restrictions such as know-your-client (KYC) regulations which may prevent a seamless

receipt of the money. In addition, parents or employers may be hesitant to supplement more money to the recipients, as they do not have visibility of recipients' transaction activities.

[0005] Therefore, there is a need to provide a solution for sharing a digital wallet for electronic transactions.

SUMMARY

[0006] According to various embodiments, there is a server for sharing a digital wallet of a primary user for an electronic transaction. The server comprises: a communication interface configured to receive a request to add an account of a secondary user to the digital wallet and information about one or more transaction controls for the secondary user from the primary user; and a processor arranged in data or signal communication with the communication interface to receive the request to add the account of the secondary user to the digital wallet and the information about the one or more transaction controls for the secondary user; wherein the processor is configured to create a linkage identifier which identifies a link between the account of the secondary user and the digital wallet, and store the information about the one or more transaction controls for the secondary user in relation to the linkage identifier, and where the communication interface receives a transaction request using the digital wallet from the secondary user, the processor is further configured to derive the linkage identifier from the transaction request, check the information about the one or more transaction controls relating to the linkage identifier, and decide whether to allow the transaction request based on the information about the one or more transaction controls relating to the linkage identifier.

[0007] In some embodiments, the processor is configured to allow the transaction request if the transaction request satisfies one or more conditions in the information about the one or more transaction controls, and decline the transaction request if the transaction request does

not satisfy the one or more conditions in the information about the one or more transaction controls.

[0008] In some embodiments, the processor is further configured to provide an account of the primary user with information about a history of electronic transactions made by the secondary user using the digital wallet.

[0009] In some embodiments, where the communication interface receives a request from the primary user to unlink the account of the secondary user from the digital wallet, the processor is further configured to deactivate the linkage identifier.

[0010] In some embodiments, where the communication interface receives a request from the primary user to unlink the account of the secondary user from the digital wallet, the processor is further configured to delete the linkage identifier.

[0011] In some embodiments, where the communication interface receives a request from the primary user to modify the information about the one or more transaction controls for the secondary user, the processor is further configured to modify the information about the one or more transaction controls for the secondary user.

[0012] In some embodiments, the information about the one or more transaction controls includes information about a monetary limit of electronic transactions which can be made by the secondary user using the digital wallet.

[0013] In some embodiments, after the linkage identifier which identifies the link between the account of the secondary user and the digital wallet is created, the processor is configured to add a transaction option using the digital wallet to the account of the secondary user.

[0014] According to various embodiments, there is a method for sharing a digital wallet of a primary user for an electronic transaction. The method includes: receiving a request to add an account of a secondary user to the digital wallet and information about one or more transaction controls for the secondary user from the primary user; creating a linkage identifier which

identifies a link between the account of the secondary user and the digital wallet; storing the information about the one or more transaction controls for the secondary user in relation to the linkage identifier; receiving a transaction request using the digital wallet from the secondary user; deriving the linkage identifier from the transaction request; checking the information about the one or more transaction controls relating to the linkage identifier; and deciding whether to allow the transaction request based on the information about the one or more transaction controls relating to the linkage identifier.

[0015] In some embodiments, the method further includes: allowing the transaction request if the transaction request satisfies one or more conditions in the information about the one or more transaction controls; and declining the transaction request if the transaction request does not satisfy the one or more conditions in the information about the one or more transaction controls.

[0016] In some embodiments, the method further includes: providing an account of the primary user with information about a history of electronic transactions made by the secondary user using the digital wallet.

[0017] In some embodiments, the method further includes: receiving a request from the primary user to unlink the account of the secondary user from the digital wallet; and deactivating the linkage identifier.

[0018] In some embodiments, the method further includes: receiving a request from the primary user to unlink the account of the secondary user from the digital wallet; and deleting the linkage identifier.

[0019] In some embodiments, the method further includes: receiving a request from the primary user to modify the information about the one or more transaction controls for the secondary user; and modifying the information about the one or more transaction controls for the secondary user.

[0020] In some embodiments, the information about the one or more transaction controls includes information about a monetary limit of electronic transactions which can be made by the secondary user using the digital wallet.

[0021] In some embodiments, the method further includes: after the linkage identifier which identifies the link between the account of the secondary user and the digital wallet is created, adding a transaction option using the digital wallet to the account of the secondary user.

[0022] According to various embodiments, a data processing apparatus configured to perform the method of any one of the above embodiments is provided.

[0023] According to various embodiments, a computer program element comprising program instructions, which, when executed by one or more processors, cause the one or more processors to perform the method of any one of the above embodiments is provided.

[0024] According to various embodiments, a computer-readable medium comprising program instructions, which, when executed by one or more processors, cause the one or more processors to perform the method of any one of the above embodiments is provided. The computer-readable medium may include a non-transitory computer-readable medium.

[0025] According to various embodiments, there is a system for sharing a digital wallet for an electronic transaction. The system comprises: a first electronic device belonging to a primary user holding the digital wallet; a second electronic device belonging to a secondary user; and a server. The server comprises: a communication interface configured to receive a request to add an account of the secondary user to the digital wallet and information about one or more transaction controls for the secondary user from the first electronic device; and a processor arranged in data or signal communication with the communication interface to receive the request to add the account of the secondary user to the digital wallet and the information about the one or more transaction controls for the secondary user; wherein the processor is configured to create a linkage identifier which identifies a link between the account of the secondary user

and the digital wallet, and store the information about the one or more transaction controls for the secondary user in relation to the linkage identifier, and where the communication interface receives a transaction request using the digital wallet from the second electronic device, the processor is further configured to derive the linkage identifier, check the information about the one or more transaction controls relating to the linkage identifier, and decide whether to allow the transaction request based on the information about the one or more transaction controls relating to the linkage identifier.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] The invention will be better understood with reference to the detailed description when considered in conjunction with the non-limiting examples and the accompanying drawings, in which:

- FIG. 1 illustrates an infrastructure of a system including a server for sharing a digital wallet for an electronic transaction according to various embodiments.
- FIG. 2 illustrates a block diagram of a server for sharing a digital wallet for an electronic transaction according to various embodiments.
- FIG. 3 illustrates a flow diagram for a method for sharing a digital wallet for an electronic transaction according to various embodiments.
- FIGS. 4 to 6 illustrate exemplary user interface screens of an electronic device of a primary user according to various embodiments.
- FIGS. 7 and 8 illustrate exemplary user interface screens of an electronic device of a secondary user according to various embodiments.

DETAILED DESCRIPTION

[0027] The following detailed description refers to the accompanying drawings that show, by way of illustration, specific details and embodiments in which the disclosure may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the disclosure. Other embodiments may be utilized, and structural and logical changes may be made without departing from the scope of the disclosure. The various embodiments are not necessarily mutually exclusive, as some embodiments can be combined with one or more other embodiments to form new embodiments.

[0028] Embodiments described in the context of one of a server and a method are analogously valid for the other of the server and method. Similarly, embodiments described in the context of a server are analogously valid for a method, and vice-versa.

[0029] Features that are described in the context of an embodiment may correspondingly be applicable to the same or similar features in the other embodiments. Features that are described in the context of an embodiment may correspondingly be applicable to the other embodiments, even if not explicitly described in these other embodiments. Furthermore, additions and/or combinations and/or alternatives as described for a feature in the context of an embodiment may correspondingly be applicable to the same or similar feature in the other embodiments.

[0030] In the context of various embodiments, the articles “a”, “an” and “the” as used with regard to a feature or element include a reference to one or more of the features or elements.

[0031] As used herein, the term “and/or” includes any and all combinations of one or more of the associated listed items.

[0032] In the following, embodiments will be described in detail.

[0033] FIG. 1 illustrates an infrastructure of a system 200 including a server 100 for sharing a digital wallet 160 for an electronic transaction according to various embodiments.

[0034] As shown in FIG. 1, the system 200 may include, but is not limited to, the server 100, one or more electronic devices 141, 151, one or more external servers 170, 180, and a network 190.

[0035] In some embodiments, the digital wallet (also referred to as an “e-wallet”) 160 may be a software program or an electronic device which allows one party to make an electronic transaction with another party bartering digital currency units for goods and/or services.

[0036] In some embodiments, the network 190 may include, but is not limited to, a Local Area Network (LAN), a Wide Area Network (WAN), a Global Area Network (GAN), or any combination thereof. The network 190 may provide a wireline communication, a wireless communication, or a combination of the wireline and wireless communication between the server 100 and the one or more electronic devices 141, 151, and between the server 100 and the one or more external servers 170, 180, for example, a financial institution server 170 and a merchant server 180.

[0037] In some embodiments, the electronic devices 141, 151 may be arranged in data or signal communication with the server 100 via the network 190. In some embodiments, the electronic devices 141, 151 may include, but are not limited to, at least one of the following: a mobile phone, a tablet computer, a laptop computer, a desktop computer, a head-mounted display and a smart watch. In some embodiments, a first electronic device 141 may belong to a primary user 140 and a second electronic device 151 may belong to a secondary user 150 (also referred to as a “dependent user”).

[0038] In some embodiments, the primary user 140 may be a user who holds the digital wallet 160 and is responsible for a spending accrued through a use of the digital wallet 160. In some embodiments, the primary user 140 may be any type of person or entity which may be able to hold the digital wallet 160 and be responsible for the spending accrued through the use of the

digital wallet 160. For example, the primary user 140 may include, but is not limited to, a parent and/or an employer.

[0039] In some embodiments, the primary user 140 may add an account of the secondary user 150 to the digital wallet 160 via the server 100, so that the secondary user 150 may make the electronic transaction using funds attributable to the digital wallet 160. The primary user 140 may be responsible for spending accrued through the secondary user's 150 use of the digital wallet 160.

[0040] In some embodiments, the primary user 140 may wish to have control over the secondary user's 150 electronic transactions. In some embodiments, the primary user 140 may set information about one or more transaction controls for the secondary user 150 to use the digital wallet 160. For example, the primary user 140 may set a monetary limit (e.g. a per-transaction limit, or a limit on total spend within a given period) for the use of the digital wallet 160 by the secondary user 150. In some embodiments, the primary user 140 may control and/or modify the information about the one or more transaction controls for the use of the digital wallet 160 by the secondary user 150.

[0041] In some embodiments, the secondary user 150 may be a user that the primary user 140 allows to make electronic transactions using funds attributable to the digital wallet 160. In some embodiments, the secondary user 150 may be any type of person or entity allowed by the primary user 140 to make the electronic transactions using funds attributable to the digital wallet 160. For example, the secondary user 150 may be a person or entity which may be unable to receive credit under regulations/law. As another example, the secondary user 150 may be a person or entity which may be unable to receive an approval from a financial institution, for example, a bank, for a line of credit. As an example, the secondary user 150 may include, but is not limited to, a child, a student, and/or an employee.

[0042] In some embodiments, although not shown, there may be a plurality of secondary users 150, and the primary user 140 may add a plurality of accounts, each corresponding to one of the plurality of secondary users 150 to the digital wallet 160 via the server 100.

[0043] In some embodiments, although not shown, there may be a plurality of primary users 140, and the account of the secondary user 150 may be added to the plurality of digital wallets 160 each corresponding to the plurality of primary users 140.

[0044] In some embodiments, the server 100, for example, implemented by a server computer, may include a communication interface 110, a processor 120, and a memory 130 (as will be described with reference to FIG. 2).

[0045] In some embodiments, the server 100 may communicate with the first electronic device 141 via the network 190. In some embodiments, the first electronic device 141 may receive a request from the primary user 140 to add the account of the secondary user 150 to the digital wallet 160. The first electronic device 141 may send the request to the server 100 to add the account of the secondary user 150 to the digital wallet 160 via the network 190. In some embodiments, the first electronic device 141 may receive the information about the one or more transaction controls for the secondary user 150 from the primary user 140. The first electronic device 141 may send the information about the one or more transaction controls for the secondary user 150 to the server 100 via the network 190.

[0046] In some embodiments, the primary user 140 may input the information about the one or more transaction controls for the secondary user 150 in the course of inputting the request to add the account of the secondary user 150 to the digital wallet 160. In some other embodiments, after the primary user 140 inputs the request to add the account of the secondary user 150 to the digital wallet 160, a user interface screen may be provided to the first electronic device 141 for the primary user 140 to input the information about the one or more transaction controls for the secondary user 150.

[0047] In some embodiments, where the server 100 receives the request to add the account of the secondary user 150 to the digital wallet 160 from the first electronic device 141, the server 100 may create a linkage identifier which identifies a link between the account of the secondary user 150 and the digital wallet 160. The linkage identifier may be used as an identifier for electronic transactions made by the secondary user 150 using the digital wallet 160. As such, the linkage identifier may be used as a proxy for the primary user's digital wallet 160 so that the secondary user 150 may use the linkage identifier to identify a payment method for electronic transactions. For example, the linkage identifier may be added as a payment method in a software application executing on the second electronic device 151. In some embodiments, the server 100 may store the information about the one or more transaction controls for the secondary user 150 in relation to the linkage identifier.

[0048] In some embodiments, the server 100 may communicate with the second electronic device 151 via the network 190. In some embodiments, the second electronic device 151 may receive a transaction request using the digital wallet 160 from the secondary user 150. The second electronic device 151 may send the transaction request using the digital wallet 160 to the server 100 via the network 190.

[0049] In some embodiments, where the server 100 receives the transaction request using the digital wallet 160 from the second electronic device 151, the server 100 may derive the linkage identifier from the transaction request. Thereafter, the server 100 may check the information about the one or more transaction controls relating to the linkage identifier. The server 100 may then decide whether to allow the transaction request based on the information about the one or more transaction controls relating to the linkage identifier.

[0050] In some embodiments, if the transaction request satisfies one or more conditions in the information about the one or more transaction controls, the server 100 may allow the transaction request. For example, if the amount of the transaction request satisfies the monetary

limit for the use of the digital wallet 160 by the secondary user 150, the server 100 may allow the transaction request. In another example, if the merchant at which the transaction is being performed, or the goods and/or services to be purchased, belongs in a category that is included in the one or more transaction controls, the server 100 may allow the transaction request. If the transaction request does not satisfy the one or more conditions in the information about the one or more transaction controls, the server 100 may decline the transaction request. For example, if the amount of the transaction request exceeds the monetary limit for the secondary user 150 set by the primary user 140, the server 100 may decline the transaction request. In another example, if the merchant at which the transaction is being performed, or the goods and/or services to be purchased, belongs in a category that is excluded by the one or more transaction controls, the server 100 may decline the transaction request.

[0051] In some embodiments, the server 100 may communicate with the merchant server 180 via the network 190. In some embodiments, the server 100 may receive transaction information relating to the transaction request from the merchant server 180 via the network 190. In some other embodiments, the second electronic device 151 may receive the transaction information from the merchant server 180 via the network 190, and then send the transaction request including the transaction information to the server 100 via the network 190. In some embodiments, the transaction information may include information about goods and/or services that the secondary user 150 is going to purchase using the digital wallet 160. For example, the information about goods and/or services may include, but is not limited to, information about name and price of the goods and/or services.

[0052] In some embodiments, the server 100 may communicate with the financial institution server 170, for example, a bank server, via the network 190. In some embodiments, where the server 100 allows the transaction request, the server 100 may request the financial institution server 170 to withdraw the amount of the transaction request from the funds deposited in the

digital wallet 160 to make payment to the merchant server 180. In some other embodiments, the server 100 may include the financial institution server 170. For example, where the server 100 allows the transaction request, the server 100 may withdraw the amount of the transaction request from the funds deposited in the digital wallet 160 to make payment to the merchant server 180.

[0053] FIG. 2 illustrates a block diagram of a server 100 for sharing a digital wallet 160 for an electronic transaction according to various embodiments.

[0054] As shown in FIG. 2, the server 100, for example, implemented by a server computer, may include a communication interface 110, a processor 120, and a memory 130.

[0055] In some embodiments, the communication interface 110 may allow one or more electronic devices 141, 151 to communicate with the processor 120 of the server 100 via a network 190, as shown in FIG. 1. In some embodiments, as shown in FIG. 1, the electronic devices 141, 151 may include, but is not limited to, a first electronic device 141 belonging to a primary user 140 who holds the digital wallet 160, and a second electronic device 151 belonging to a secondary user 150 who is allowed by the primary user 140 to make the electronic transaction using funds attributable to the digital wallet 160. In some embodiments, the communication interface 110 may transmit signals to the electronic devices 141, 151, and/or receive signals from the electronic devices 141, 151 via the network 190.

[0056] In some embodiments, the communication interface 110 may allow one or more external servers 170, 180, for example, a financial institution server 170 and a merchant server 180, to communicate with the processor 120 of the server 100 via the network 190, as shown in FIG. 1. In some embodiments, the communication interface 110 may transmit signals to the external servers 170, 180 and/or receive signals from the external servers 170, 180 via the network 190.

[0057] In some embodiments, the communication interface 110 may receive a request to add an account of the secondary user 150 to the digital wallet 160 from the primary user 140. In some embodiments, the first electronic device 141 may receive the request to add the account of the secondary user 150 to the digital wallet 160 from the primary user 140. The first electronic device 141 may send the request to add the account of the secondary user 150 to the digital wallet 160 to the communication interface 110 via the network 190.

[0058] In some embodiments, the communication interface 110 may receive information about one or more transaction controls for the secondary user 150 from the primary user 140. For example, the primary user 140 may assign a spending limit, for example, an amount per each electronic transaction or a total amount per month, to the secondary user 150. In some embodiments, the first electronic device 141 may receive the information about the one or more transaction controls for the secondary user 150 from the primary user 140. The first electronic device 141 may send the information about the one or more transaction controls for the secondary user 150 to the communication interface 110 via the network 190.

[0059] In some embodiments, the communication interface 110 may concurrently receive the request to add the account of the secondary user 150 to the digital wallet 160 and the information about the one or more transaction controls for the secondary user 150. For example, the primary user 140 may input the information about the one or more transaction controls for the secondary user 150 in the course of inputting the request to add the account of the secondary user 150 to the digital wallet 160. In some other embodiments, the communication interface 110 may receive the request to add the account of the secondary user 150 to the digital wallet 160 first, and subsequently receive the information about the one or more transaction controls for the secondary user 150. For example, after the primary user 140 inputs the request to add the account of the secondary user 150 to the digital wallet 160, a user

interface screen may be provided to the first electronic device 141 for the primary user 140 to input the information about the one or more transaction controls for the secondary user 150.

[0060] The processor 120 may include, but is not limited to, a microprocessor, an analogue circuit, a digital circuit, a mixed-signal circuit, a logic circuit, an integrated circuit, a Central Processing Unit (CPU), a Graphics Processing Unit (GPU), a Digital Signal Processor (DSP), a Field Programmable Gate Array (FPGA), an Application Specific Integrated Circuit (ASIC), or any combination thereof. Any other kind of implementation of the respective functions, which will be described below in further detail, may also be understood as the processor 120.

[0061] In some embodiments, the processor 120 may be arranged in data or signal communication with the communication interface 110 to receive the request to add the account of the secondary user 150 to the digital wallet 160 of the primary user 140 and the information about the one or more transaction controls for the secondary user 150.

[0062] In some embodiments, the processor 120 may receive concurrently the request to add the account of the secondary user 150 to the digital wallet 160 and the information about the one or more transaction controls for the secondary user 150 from the communication interface 110. In some other embodiments, the processor 120 may receive the request to add the account of the secondary user 150 to the digital wallet 160 first, and subsequently receive the information about the one or more transaction controls for the secondary user 150 from the communication interface 110.

[0063] In some embodiments, the processor 120 may link the account of the secondary user 150 to the digital wallet 160 of the primary user 140 by a secured linkage process. In some embodiments, a multi-factor authentication may be required for the secured linkage process. In some embodiments, the primary user 140 may be required to input an identifier of the secondary user 150 and secured information for the multi-factor authentication for the secured linkage process.

[0064] In some embodiments, the identifier may include, but is not limited to, a mobile number, an email address, an Identity Document (ID) card number, and ID (e.g. ID of a digital wallet application/program) of the secondary user 150.

[0065] In some embodiments, the secured information may include, but is not limited to, a secured code. For example, the primary user 140 may input the mobile number of the secondary user 150, as the identifier of the secondary user 150. The processor 120 may receive the mobile number of the secondary user 150 from the first electronic device 141 via the communication interface 110. The processor 120 may then create and send the secured code, for example, a One-time Password (OTP) which is valid for a certain period of time, to the mobile number of the secondary user 150. The second electronic device 151 to which the said mobile number is assigned may receive the OTP from the processor 120 via the communication interface 110. The primary user 140 may then input the OTP sent to the second electronic device 151. The processor 120 may receive the OTP from the first electronic device 141 via the communication interface 110, and check if the OTP received from the first electronic device 141 is the same as the OTP sent to the second electronic device 151. If the OTP received from the first electronic device 141 is the same as the OTP sent to the second electronic device 151, the processor 120 may link the account of the secondary user 150 to the digital wallet 160 of the primary user 140. In another example, the primary user 140 may input the email address of the secondary user 150, as the identifier of the secondary user 150, and the processor 120 may create and send the secured code to the email address of the secondary user 150.

[0066] In some other embodiments, the secured information may include biometric information including, but not limited to, a fingerprint, a face recognition template, a voice recognition template, an iris recognition template, and a palm print of the secondary user 150. For example, the primary user 140 may input the mobile number of the secondary user 150 as the identifier of the secondary user 150 and select the fingerprint of the secondary user 150 as

the secured information. The processor 120 may request the second user 150 to scan his/her fingerprint, and the second user 150 may scan his/her fingerprint on a fingerprint sensor embedded in or connected to the second electronic device 151. The second electronic device 151 may check if the scanned fingerprint matches fingerprint data of the second user 150 stored in the second electronic device 151. If the scanned fingerprint matches the fingerprint data of the second user 150 stored in the second electronic device 151, the processor 120 may link the account of the secondary user 150 to the digital wallet 160 of the primary user 140.

[0067] In some other embodiments, the secured information may be a combination of the secured code and any of the biometric information of the secondary user 150.

[0068] In some embodiments, after a successful authentication, the processor 120 may link the account of the secondary user 150 to the digital wallet 160 of the primary user 140. In this manner, the digital wallet 160 of the primary user 140 may be linked securely to the account of the secondary user 150.

[0069] In some embodiments, the processor 120 may create a linkage identifier which identifies the link between the account of the secondary user 150 and the digital wallet 160 of the primary user 140. The linkage identifier may be a unique identifier which identifies the link between the account of the secondary user 150 and the digital wallet 160. The linkage identifier may be used as an identifier for the electronic transaction made by the secondary user 150 using the digital wallet 160. The linkage identifier may be different from an identifier of the digital wallet 160 which is used for the electronic transaction of the primary user 140.

[0070] During the linkage process, an intermediate digital wallet and/or an additional digital wallet for the secondary user 150 is not created. Instead, the linkage identifier may be used as the identifier for the electronic transaction made by the secondary user 150 using the digital wallet 160. During the electronic transaction made by the secondary user 150 using the digital wallet 160, a payment gateway (not shown) of the server 100 may charge the digital wallet 160

of the primary user 140, even though the charge is initiated from the account of the secondary user 150.

[0071] The memory 130 (also referred to as a “database”) may store input data and/or output data temporarily or permanently. In some embodiments, the memory 130 may store program code which allows the server 100 to perform a method 300 (as will be described with reference to FIG. 3). In some embodiments, the program code may be embedded in a payment Software Development Kit (SDK). The memory 130 may include an internal memory of the server 100 and/or an external memory. The external memory may include, but is not limited to, an external storage medium, for example, a memory card, a flash drive, and a web storage. In some embodiments, the processor 120 may store the linkage identifier in the memory 130. In some embodiments, the processor 120 may store the information about the one or more transaction controls for the secondary user 150 in relation to the linkage identifier in the memory 130.

[0072] In some embodiments, the communication interface 110 may receive a transaction request using the digital wallet 160 of the primary user 140 from the secondary user 150. In some embodiments, the second electronic device 151 may receive the transaction request using the digital wallet 160 from the secondary user 150. The second electronic device 151 may send the transaction request using the digital wallet 160 to the communication interface 110 via the network 190.

[0073] In some embodiments, the processor 120 may receive the transaction request using the digital wallet 160 from the communication interface 110. The processor 120 may then derive the linkage identifier from the transaction request. Thereafter, the processor 120 may check the information about the one or more transaction controls relating to the linkage identifier. For example, the processor 120 may access the memory 130 to check the information about the one or more transaction controls relating to the linkage identifier derived from the transaction request. The processor 120 may then decide whether to allow the transaction request based on

the information about the one or more transaction controls relating to the linkage identifier saved in the memory 130.

[0074] In some embodiments, if the transaction request satisfies one or more conditions in the information about the one or more transaction controls, the processor 120 may allow the transaction request. For example, if the amount of the transaction request satisfies the monetary limit for the use of the digital wallet 160 by the secondary user 150, the processor 120 may allow the transaction request. If the transaction request does not satisfy the one or more conditions in the information about the one or more transaction controls, the processor 120 may decline the transaction request. For example, if the amount of the transaction request exceeds the monetary limit, the processor 120 may decline the transaction request.

[0075] In some embodiments, the processor 120 may provide an account of the primary user 140 with information about a history of the electronic transaction made by the secondary user 150 using the digital wallet 160. In some embodiments, the first electronic device 141 may display a user experience screen showing the information about the history of the electronic transaction made by the secondary user 150 using the digital wallet 160. Such information may include, but is not limited to, merchant name, price and name of the goods and/or services that the secondary user 150 has purchased using the digital wallet 160. In this manner, in accordance with various embodiments, the primary user 140 may track spending of the secondary user 150.

[0076] In some embodiments, there may be a plurality of secondary users 150, and the primary user 140 may add a plurality of accounts each corresponding to the plurality of secondary users 150 to the digital wallet 160 using the server 100. In some embodiments, the first electronic device 141 may display a user experience screen showing the information about the history of the electronic transaction made by the plurality of secondary users 150 using the digital wallet 160. In this manner, in accordance with various embodiments, the primary user 140 may track spending of each of the linked secondary users 150.

[0077] In some embodiments, the communication interface 110 may receive a request from the primary user 140 to unlink the account of the secondary user 150 from the digital wallet 160. In some embodiments, the first electronic device 141 may receive the request from the primary user 140 to unlink the account of the secondary user 150 from the digital wallet 160, and send the request to unlink the account of the secondary user 150 from the digital wallet 160 to the communication interface 110. The communication interface 110 may then send the request to unlink the account of the secondary user 150 from the digital wallet 160 to the processor 120. The processor 120 may receive the request to unlink the account of the secondary user 150 from the digital wallet 160 from the communication interface 110, and then unlink the account of the secondary user 150 from the digital wallet 160. The unlinked secondary user 150 may no longer use the digital wallet 160 shared by the primary user 140.

[0078] In some embodiments, where the processor 120 receives the request to unlink the account of the secondary user 150 from the digital wallet 160 from the communication interface 110, the processor 120 may deactivate the linkage identifier which identifies the link between the account of the secondary user 150 and the digital wallet 160 of the primary user 140. The processor 120 may record information about the deactivation of the linkage identifier in the memory 130. Later on, if the processor 120 receives a new request to link the account of the secondary user 150 to the digital wallet 160 from the communication interface 110, the processor 120 may activate the linkage identifier which identifies the link between the account of the secondary user 150 and the digital wallet 160 of the primary user 140. The processor 120 may record information about the activation of the linkage identifier in the memory 130.

[0079] In some other embodiments, where the processor 120 receives the request to unlink the account of the secondary user 150 from the digital wallet 160 from the communication interface 110, the processor 120 may delete the linkage identifier which identifies the link between the account of the secondary user 150 and the digital wallet 160 of the primary user 140 from the

memory 130. Later on, if the processor 120 receives a new request to link the account of the secondary user 150 to the digital wallet 160 from the communication interface 110, the processor 120 may create a new linkage identifier which identifies a new link between the account of the secondary user 150 and the digital wallet 160 of the primary user 140. The processor 120 may record the new linkage identifier in the memory 130.

[0080] In some embodiments, the communication interface 110 may receive a request from the primary user 140 to modify the information about the one or more transaction controls for the secondary user 150. In some embodiments, the first electronic device 141 may receive the request from the primary user 140 to modify the information about the one or more transaction controls for the secondary user 150, and send the request to modify the information about the one or more transaction controls for the secondary user 150 to the communication interface 110. The communication interface 110 may then send the request to modify the information about the one or more transaction controls for the secondary user 150 to the processor 120. The processor 120 may receive the request to modify the information about the one or more transaction controls for the secondary user 150 from the communication interface 110, and then modify the information about the one or more transaction controls for the secondary user 150.

[0081] In some embodiments, after the linkage identifier which identifies the link between the account of the secondary user 150 and the digital wallet 160 of the primary user 140 is created, the processor 120 may add a transaction option using the digital wallet 160 of the primary user 140 to the account of the secondary user 150. In some embodiments, the second electronic device 151 may display information about the digital wallet 160 of the primary user 140 as one of the available transaction options (payment methods). The secondary user 150 may then select the added transaction option to make the electronic transaction using the digital wallet 160 of the primary user 140.

[0082] As described above, in accordance with various embodiments, the primary user 140 may easily share the digital wallet 160 with the secondary user 150 and allow the secondary user 150 to use the digital wallet 160 seamlessly, without the need to seek consent from the primary user 140 each time. In addition, since the primary user 140 can assign a spending limit to the secondary user 150, the primary user 140 may avoid unexpected spending and have control over the secondary user's 150 electronic transactions. Moreover, since there is no movement of funds from the digital wallet 160 of the primary user 140 to a digital wallet or a bank account of the secondary user 150, and the digital wallet 160 of the primary user 140 can be added as one of the payment methods for the secondary user 150, the secondary user 150 may make the electronic transaction using the digital wallet 160 of the primary user 150 without the need to ask the primary user 140 to transfer funds to the digital wallet or the bank account of the secondary user 150.

[0083] In addition, in some embodiments, the account of the primary user 140 may gain reward points provided by the server 100 for the electronic transaction made by the secondary user 150 using the digital wallet 160.

[0084] FIG. 3 illustrates a flow diagram for a method 300 for sharing a digital wallet for an electronic transaction according to various embodiments. According to various embodiments, the method 300 for sharing the digital wallet for the electronic transaction is provided.

[0085] In some embodiments, the method 300 may be implemented by the server 100 illustrated in FIGS. 1 and 2. In some embodiments, the method 300 may be carried out by the server 100 illustrated in FIGS. 1 and 2.

[0086] In some embodiments, the method 300 may include a step 301 of receiving a request to add an account of a secondary user 150 to the digital wallet 160 of a primary user 140 and information about one or more transaction controls for the secondary user 150 from the primary user 140. For example, receiving the request to add the account of the secondary user 150 to

the digital wallet 160 and receiving the information about the one or more transaction controls for the secondary user 150 may be performed as two subsequent steps. As another example, receiving the request to add the account of the secondary user 150 to the digital wallet 160 and receiving the information about the one or more transaction controls for the secondary user 150 may be performed as a single step.

[0087] In some embodiments, the method 300 may include a step 302 of creating a linkage identifier which identifies a link between the account of the secondary user 150 and the digital wallet 160 of the primary user 140.

[0088] In some embodiments, the method 300 may include a step 303 of storing the information about the one or more transaction controls for the secondary user 150 in relation to the linkage identifier.

[0089] In some embodiments, the method 300 may include a step 304 of receiving a transaction request using the digital wallet 160 of the primary user 140 from the secondary user 150.

[0090] In some embodiments, the method 300 may include a step 305 of deriving the linkage identifier. For example, the linkage identifier may be derived from the transaction request.

[0091] In some embodiments, the method 300 may include a step 306 of checking the information about the one or more transaction controls relating to the linkage identifier.

[0092] In some embodiments, the method 300 may include a step 307 of deciding whether to allow the transaction request based on the information about the one or more transaction controls relating to the linkage identifier.

[0093] In some embodiments, although not shown, the method 300 may further include a step of allowing the transaction request if the transaction request satisfies one or more conditions in the information about the one or more transaction controls, and declining the transaction request if the transaction request does not satisfy the one or more conditions in the information about the one or more transaction controls.

[0094] FIGS. 4 to 6 illustrate exemplary user interface screens of an electronic device of a primary user 140 according to various embodiments. The electronic device may include a first electronic device 141 belonging to the primary user 140 who holds a digital wallet 160.

[0095] FIG. 4 illustrates exemplary user interface screens 141a - 141d displayed by the first electronic device 141 of the primary user 140 showing a linkage process between the digital wallet 160 of the primary user 140 and an account of a secondary user 150.

[0096] As shown in FIG. 4, the first electronic device 141 may display the user interface screen 141a for the primary user 140 to request for a link between the digital wallet 160 of the primary user 140 and the account of the secondary user 150. For example, although not shown, if the primary user 140 accesses a digital wallet application/program with an account of the primary user 140 via the first electronic device 141, the user interface screen 141a may be displayed by the first electronic device 141.

[0097] As shown in FIG. 4, the first electronic device 141 may display an image object 401 (also referred to as an “icon” or a “button”) for linking the account of the secondary user 150 to the digital wallet 160 of the primary user 140 on the user interface screen 141a. If the primary user 140 selects the image object 401 on the user interface screen 141a, the first electronic device 141 may display the user interface screen 141b for the primary user 140 to input an identifier of the secondary user 150.

[0098] For example, as shown in FIG. 4, the primary user 140 may input a mobile number of the secondary user 150 into a space 403 on the user interface screen 141b, as the identifier of the secondary user 150. The primary user 140 may then select an image object 404 for submitting the input mobile number to a server 100 illustrated in FIGS. 1 and 2.

[0099] Although not shown, the server 100 may receive the mobile number of the secondary user 150 from the first electronic device 141. The server 100, for example, a processor 120, may then create and send a secured code, for example, a One-time Password (OTP), to the

mobile number of the secondary user 150. A second electronic device 151 to which the said mobile number is assigned may receive the OTP from the server 100.

[00100] The primary user 140 may then input the OTP sent to the second electronic device 151 into a space 405 on the user interface screen 141c, and then select an image object 406 for submitting the input OTP to the server 100.

[00101] Although not shown, the server 100 may receive the OTP from the first electronic device 141, and check if the OTP received from the first electronic device 141 is the same as the OTP sent to the second electronic device 151. If the OTP received from the first electronic device 141 is the same as the OTP sent to the second electronic device 151, the server 100 may link the account of the secondary user 150 to the digital wallet 160 of the primary user 140.

[00102] As shown in FIG. 4, the first electronic device 141 may then display the user interface screen 141d showing that the account of the secondary user 150 is successfully linked to the digital wallet 160 of the primary user 140.

[00103] FIG. 5 illustrates an exemplary user interface screen 141e displayed by the first electronic device 141 of the primary user 140 showing information about a plurality of secondary users 150 linked to the digital wallet 160 of the primary user 140.

[00104] As shown in FIG. 5, the first electronic device 141 may display the user interface screen 141e showing information 408, 409 about each of the plurality of secondary users 150 linked to the digital wallet 160 of the primary user 140. Such information 408, 409 may include, but is not limited to, a mobile number of each secondary user 150, name of each secondary user 150, a monthly transaction limit for each secondary user 150, and/or each transaction limit for each secondary user 150. In this manner, the primary user 140 may have a holistic view of the electronic transactions made by different secondary users 150 on the shared digital wallet 160.

[00105] As shown in FIG. 5, the first electronic device 141 may further display an image object 410 on the user interface screen 141e, for the primary user 140 to request for another link between the digital wallet 160 of the primary user 140 and an account of another secondary user.

[00106] FIG. 6 illustrates exemplary user interface screens 141f and 141g displayed by the first electronic device 141 of the primary user 140 showing an unlink process between the digital wallet 160 of the primary user 140 and the account of the secondary user 150.

[00107] Although not shown, the primary user 140 may select information 409 corresponding to one of the plurality of secondary users 150 from the user interface screen 141e of FIG. 5.

[00108] As shown in FIG. 6, the first electronic device 141 may display the user interface screen 141f showing detailed information about the selected secondary user linked to the digital wallet 160 of the primary user 140. The detailed information may include, but is not limited to, a mobile number of the selected secondary user, a name of the selected secondary user, monthly spends of the selected secondary user, a monthly transaction limit for the selected secondary user, and/or each transaction limit for the selected secondary user.

[00109] Although not shown, if the primary user 140 selects an area 412 where the monthly spends are displayed, the first electronic device 141 may display details of the monthly spends. Although not shown, the primary user 140 may select an area 413 where the monthly transaction limit is displayed or an area 414 where the each transaction limit is displayed, to modify the monthly transaction limit or the per transaction limit for the selected secondary user, respectively.

[00110] As shown in FIG. 6, the first electronic device 141 may further display information 415 about a history of the electronic transactions made by the selected secondary user using the digital wallet 160.

[00111] As shown in FIG. 6, the first electronic device 141 may display an image object 416 for the primary user 140 to request to unlink the account of the selected secondary user from the digital wallet 160 of the primary user 140. If the primary user 140 selects the image object 416, the first electronic device 141 may display the user interface screen 141g. As shown in FIG. 6, the first electronic device 141 may display a pop-up window 417 on the user interface screen 141g for the primary user 140 to confirm the request to unlink.

[00112] Although not shown, if the primary user 140 selects an image object 418 for confirming the request to unlink, the first electronic device 141 may send the request to unlink the account of the selected secondary user from the digital wallet 160 to the server 100, and then the server 100 may unlink the account of the selected secondary user from the digital wallet 160.

[00113] FIGS. 7 and 8 illustrate exemplary user interface screens of an electronic device of a secondary user 150 according to various embodiments. The electronic device may include a second electronic device 151 belonging to the secondary user 150.

[00114] FIG. 7 illustrates exemplary user interface screens 151a - 151b displayed by the second electronic device 151 of the secondary user 150 showing an electronic transaction using a digital wallet 160 linked to an account of the secondary user 150.

[00115] As shown in FIG. 7, the second electronic device 151 may display the user interface screen 151a for the secondary user 150 to make the electronic transaction for goods. The second electronic device 151 may display information 419 about the selected goods and/or information 420 about a payment method on the user interface screen 151a. For example, the information 420 about the payment method may show information about a default payment method or a latest payment method. Although not shown, if the secondary user 150 may select an image object 421 for payment for the goods, the electronic transaction may be made by the payment method based on the displayed information 420.

[00116] If the secondary user 150 selects the information 420 about the payment method, the second electronic device 151 may display the user interface screen 151b, as shown in FIG. 7. The second electronic device 151 may display a pop-up window 422 showing information about payment method options on the user interface screen 151b. If the secondary user 150 selects an image object 423 for selecting a payment using the digital wallet 160 of the primary user 140 and then selects an image object 424 for payment for the goods, the electronic transaction may be made using the digital wallet 160 of the primary user 140.

[00117] FIG. 8 illustrates exemplary user interface screens 151c - 151d displayed by the second electronic device 151 of the secondary user 150 showing the electronic transaction using the digital wallet 160 linked to the account of the secondary user 150.

[00118] As shown in FIG. 8, the second electronic device 151 may display the user interface screen 151c for the secondary user 150 to make the electronic transaction for the goods. The second electronic device 151 may display the information 419 about the selected goods and/or information 420 about the payment method on the user interface screen 151c.

[00119] If the secondary user 150 selects the information 420 about the payment method, the second electronic device 151 may display the user interface screen 151d, as shown in FIG. 8. The second electronic device 151 may display a pop-up window 422 showing information about payment method options on the user interface screen 151d.

[00120] As shown in FIG. 8, if the account of the secondary user 150 is linked to a plurality of digital wallets 160 each corresponding to a plurality of primary users 140, the pop-up window 422 may display information about the plurality of digital wallets 160, as the payment method options. The information about the plurality of digital wallets 160 may include, but are not limited to, a name of each primary user 140, a monthly transaction limit assigned by each primary user 140, and/or each transaction limit assigned by each primary user 140. If the secondary user 150 selects an image object 423 for selecting a payment using one of the

plurality of digital wallets 160, and then selects an image object 424 for payment for the goods, the electronic transaction may be made using the selected digital wallet.

[00121] While the disclosure has been particularly shown and described with reference to specific embodiments, it should be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention as defined by the appended claims. The scope of the invention is thus indicated by the appended claims and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced.

CLAIMS

1. A server for sharing a digital wallet of a primary user for an electronic transaction, the server comprising:

a communication interface configured to receive a request to add an account of a secondary user to the digital wallet and information about one or more transaction controls for the secondary user from the primary user; and

a processor arranged in data or signal communication with the communication interface to receive the request to add the account of the secondary user to the digital wallet and the information about the one or more transaction controls for the secondary user;

wherein the processor is configured to create a linkage identifier which identifies a link between the account of the secondary user and the digital wallet, and store the information about the one or more transaction controls for the secondary user in relation to the linkage identifier, and

where the communication interface receives a transaction request using the digital wallet from the secondary user, the processor is further configured to derive the linkage identifier from the transaction request, check the information about the one or more transaction controls relating to the linkage identifier, and decide whether to allow the transaction request based on the information about the one or more transaction controls relating to the linkage identifier, and

wherein the processor is configured to request the primary user to input an identifier of the secondary user, create a secured code which is valid for a certain period of time, send the secured code to an electronic device of the secondary user based on the inputted identifier of the secondary user, request the primary user to input the secured code, check whether the inputted secured code is the same as the secured code sent to the electronic device of the

secondary user, and link the account of the secondary user to the digital wallet if the inputted secured code is the same as the secured code sent to the electronic device of the secondary user.

2. The server according to claim 1, wherein the processor is configured to allow the transaction request if the transaction request satisfies one or more conditions in the information about the one or more transaction controls, and decline the transaction request if the transaction request does not satisfy the one or more conditions in the information about the one or more transaction controls.

3. The server according to claim 1 or claim 2, wherein the processor is further configured to provide an account of the primary user with information about a history of electronic transactions made by the secondary user using the digital wallet.

4. The server according to any one of claims 1 to 3, wherein where the communication interface receives a request from the primary user to unlink the account of the secondary user from the digital wallet, the processor is further configured to deactivate the linkage identifier.

5. The server according to any one of claims 1 to 3, wherein where the communication interface receives a request from the primary user to unlink the account of the secondary user from the digital wallet, the processor is further configured to delete the linkage identifier.

6. The server according to any one of claims 1 to 5, wherein where the communication interface receives a request from the primary user to modify the information about the one or more transaction controls for the secondary user, the processor is further configured to modify the information about the one or more transaction controls for the secondary user.

7. The server according to any one of claims 1 to 6, wherein the information about the one or more transaction controls includes information about a monetary limit of electronic transactions which can be made by the secondary user using the digital wallet.

8. The server according to any one of claims 1 to 7, wherein after the linkage identifier which identifies the link between the account of the secondary user and the digital wallet is created, the processor is configured to add a transaction option using the digital wallet to the account of the secondary user.

9. A method for sharing a digital wallet of a primary user for an electronic transaction, the method comprising:

receiving, by a communication interface, a request to add an account of a secondary user to the digital wallet and information about one or more transaction controls for the secondary user from the primary user;

creating, by a processor, a linkage identifier which identifies a link between the account of the secondary user and the digital wallet;

storing, by the processor, the information about the one or more transaction controls for the secondary user in relation to the linkage identifier;

receiving, by the communication interface, a transaction request using the digital wallet from the secondary user;

deriving, by the processor, the linkage identifier from the transaction request;

checking, by the processor, the information about the one or more transaction controls relating to the linkage identifier; and

deciding, by the processor, whether to allow the transaction request based on the information about the one or more transaction controls relating to the linkage identifier,

wherein the method further comprises:

requesting, by the processor, the primary user to input an identifier of the secondary user;

creating, by the processor, a secured code which is valid for a certain period of time;

sending, by the processor, the secured code to an electronic device of the secondary user based on the inputted identifier of the secondary user;

requesting, by the processor, the primary user to input the secured code;

checking, by the processor, whether the inputted secured code is the same as the secured code sent to the electronic device of the secondary user; and

linking, by the processor, the account of the secondary user to the digital wallet if the inputted secured code is the same as the secured code sent to the electronic device of the secondary user.

10. The method according to claim 9 further comprising:

allowing, by the processor, the transaction request if the transaction request satisfies one or more conditions in the information about the one or more transaction controls; and

declining, by the processor, the transaction request if the transaction request does not satisfy the one or more conditions in the information about the one or more transaction controls.

11. The method according to claim 9 or claim 10 further comprising:

providing, by the processor, an account of the primary user with information about a history of electronic transactions made by the secondary user using the digital wallet.

12. The method according to any one of claims 9 to 11 further comprising:
receiving, by the communication interface, a request from the primary user to unlink the account of the secondary user from the digital wallet; and
deactivating, by the processor, the linkage identifier.
13. The method according to any one of claims 9 to 11 further comprising:
receiving, by the communication interface, a request from the primary user to unlink the account of the secondary user from the digital wallet; and
deleting, by the processor, the linkage identifier.
14. The method according to any one of claims 9 to 13 further comprising:
receiving, by the communication interface, a request from the primary user to modify the information about the one or more transaction controls for the secondary user; and
modifying, by the processor, the information about the one or more transaction controls for the secondary user.
15. The method according to any one of claims 9 to 14, wherein the information about the one or more transaction controls includes information about a monetary limit of electronic transactions which can be made by the secondary user using the digital wallet.
16. The method according to any one of claims 9 to 15 further comprising:
after the linkage identifier which identifies the link between the account of the secondary user and the digital wallet is created, adding, by the processor, a transaction option using the digital wallet to the account of the secondary user.

17. A data processing apparatus configured to perform the method of any one of claims 9 to 16.

18. A computer-readable medium comprising program instructions, which, when executed by one or more processors, cause the one or more processors to perform the method of any one of claims 9 to 16.