CONDUCTING A TRANSACTION BETWEEN A SERVICE PROVIDER AND A MERCHANT

TECHNICAL FIELD OF DISCLOSURE

[001] The following discloses arrangements for conducting a transaction between a telecommunication service provider and a merchant.

BACKGROUND

[002] Transactions made over the Internet typically require for a consumer to have a payment card; or a digital wallet, which is an account registered with a payment service provider (such as PayPal™) that is linked to a source of funds, that can make the payment for such transactions. An example of such transactions would be the purchase of software applications that are designed to operate in a smart phone, the transaction being performed using the smart phone.

[003] There exists a pool of consumers who have access to a smart phone, but do not have access to a payment card or cannot enroll with a payment service provider. To tap this pool of consumers, several software application merchants have tied up with telecommunication service providers to offer direct carrier billing. Direct carrier billing is a method of payment that charges payment directly to a consumer's telephone bill. However, for a telecommunication service provider to provide direct carrier billing services to subscribers, its systems have to be integrated with the merchant systems. Such integration is complicated and time consuming, which could discourage a telecommunication service provider from offering a direct carrier billing service, since the cost to undertake the integration may outweigh the revenue benefits obtained from offering this service.

[004] There thus is a need to more readily have a service provider, such as a telecommunication service provider, allow their subscribers to make online transactions on the basis of their registration with the service provider.

SUMMARY

[004a] According to one aspect of the disclosure, there is provided a method by a system comprising a server network, a service provider server and a merchant

server for facilitating a transaction between a service provider corresponding to the service provider server and a merchant corresponding to the merchant server, the method comprising: generating, by the server network, an account number to a subscriber registered with the service provider, the account number corresponding to a registration ID that the subscriber has with the service provider and suitable for making a transaction with the merchant; generating, by the server network, a unique reference corresponding to the account number, the unique reference mapping the subscriber to the account number; transmitting, by the server network, upon receiving use of the account number for the transaction, the unique reference to the service provider server; identifying, by the service provider server, the subscriber to which the account number belongs, in response to the transmitted unique reference; and associating, by the service provider server, the transaction to the registration ID of the identified subscriber so as to facilitate the transaction with the merchant.

[004b] According to one aspect of the disclosure, there is provided a service provider server for facilitating a transaction with a merchant corresponding to a merchant server, the service provider server corresponding to a service provider and comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with the at least one processor, cause the service provider server at least to: receive a unique reference generated corresponding to an account number suitable for making a transaction with the merchant, the account number being generated to a subscriber registered with the service provider and corresponding to a registration ID that the subscriber has with the service provider, the unique reference mapping the account number to the subscriber, identify the subscriber to which the account number belongs in response to the received unique reference, and associate the transaction to the registration ID of the identified subscriber so as to facilitate the transaction with the merchant.

[004c] According to one aspect of the disclosure, there is provided a server network for facilitating a transaction between a service provider corresponding to a service provider server and a merchant corresponding to a merchant server, the server network comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with the at least one processor, cause the server

network at least to: generate a unique reference that is used to map an account number generated corresponding to a subscriber registered with the service provider, the account number corresponding to a registration ID that the subscriber has with the service provider and suitable for making a transaction with the merchant, and transmit, upon receiving use of the account number for the transaction, the unique reference to the service provider server, wherein the subscriber to which the account number belongs is identified by the service provider server in response to the transmitted unique reference, and the transaction is associated by the service provider server to the registration ID of the identified subscriber so as to facilitate the transaction between the service provider and the merchant.

[004d] According to one aspect of the disclosure, there is provided a system comprising a server network, a service provider server, and a merchant server for facilitating a transaction between a service provider corresponding to the service provider server and a merchant corresponding to the merchant server, wherein the server network comprises: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with the at least one processor, cause the server network at least to generate a unique reference that is used to map an account number generated to a subscriber registered with the service provider, the account number corresponding to a registration ID that the subscriber has with the service provider and suitable for making a transaction with the merchant; and transmit, upon receiving use of the account number for the transaction, the unique reference to the service provider server; and wherein the service provider server comprises: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with the at least one processor, cause the service provider server at least to receive the unique reference; identify the subscriber to which the account number belongs in response to the received unique reference; associate the transaction to the registration ID of the identified subscriber so as to facilitate the transaction with the merchant.

[005] According to some examples of the disclosure, there is provided a method for conducting a transaction between a service provider and a

merchant, the method comprising: issuing an account number against which a transaction with the

merchant is made, wherein the account number belongs to a subscriber registered with the service provider; assigning a unique reference used to map the subscriber to the account number; and transmitting, upon receiving use of the account number for the transaction, the unique reference and details of the transaction to the service provider, wherein the unique reference is processed against a database of unique references to identify the subscriber to which the account number belongs, for the service provider to associate the transaction to the identified subscriber, based on the details of the transaction.

[006] According to some examples of the disclosure, there is provided a service provider server for conducting a transaction with a merchant, the service provider server comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with the at least one processor, cause the service provider server at least to: receive details of the transaction and a unique reference assigned to an account number against which the transaction is made, the unique reference used to map the account number to a subscriber registered with the service provider to which the account number belongs, process the unique reference against a database of unique references to identify the subscriber to which the account number belongs, and associate the details of the transaction to the identified subscriber.

[007] According to some examples of the disclosure, there is provided a server network for facilitating a transaction between a service provider and a merchant, the server comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with the at least one processor, cause the server network at least to: assign a unique reference that is used to map an account number issued to a subscriber registered with the service provider, wherein a transaction with the merchant is made against the account number, and transmit, upon receiving use of the account number for the transaction, the unique reference and details of the transaction to the service provider, wherein the unique reference is processed against a database of unique references to identify the subscriber to which the account number belongs, for the service provider to associate the details of the transaction to the identified subscriber.

[008] According to some examples of the disclosure, there is provided a system for conducting a transaction between a service provider and a merchant, the system comprising: a server network comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with the at least one processor, cause the server network at least to assign a unique reference that is used to map an account number issued to a subscriber registered with the service provider, wherein a transaction with the merchant is made against the account number; and transmit, upon receiving use of the account number for the transaction, the unique reference and details of the transaction to the service provider; and a service provider server comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with the at least one processor, cause the service provider server at least to receive the details of the transaction and the unique reference; process the unique reference against a database of unique references to identify the subscriber to which the account number belongs; and associate the details of the transaction to the identified subscriber.

BRIEF DESCRIPTION OF THE DRAWINGS

[009] Embodiments of the disclosure will be better understood and readily apparent to one of ordinary skill in the art from the following written description, by way of example only, and in conjunction with the drawings, in which:

[010] Figure 1 shows a schematic of a system for conducting a transaction between a service provider, such as a telecommunication service provider, and a merchant.

[011] Figure 2 shows an exemplary computing device to realize the server, which facilitates the transaction between the telecommunication service provider and the merchant, shown in Figure 1.

[012] Figure 3 shows a flowchart depicting steps of a method that allows a service provider to perform a transaction with a merchant.

[013] Figure 4 shows a schematic of the server that facilitates the transaction between the telecommunication service provider and the merchant in the system of Figure 1.

[014] Figure 5 shows a sequence of steps that may occur to have a subscriber register with a service provider, such as a telecommunication service provider, that allows the transaction described with respect to Figure 3.

[015] Figure 6 shows a schematic of a server at the telecommunication service provider of the system of Figure 1.

[016] Figure 7 shows the server of Figure 6 in communication with the server of Figure 4, so as to realise a system shown in Figure 1.

[017] Figure 8 shows the various stages of having the system of Figure 1 perform a transaction with the merchant.

DETAILED DESCRIPTION

[018] In the following description, various embodiments of the disclosure are described, by way of example only, with reference to the drawings, where like reference characters generally refer to the same parts throughout the different views. A transaction between a service provider and a merchant is described, where the service provider may be any one or more of a telecommunication service provider, a financial services provider or an online service provider. In Figure 1, the working principles underlying such a transaction are described with reference to a telecommunication service provider, where it will be appreciated that the same working principles apply for other service providers, such a financial services provider and an online service provider.

[019] Figure 1 shows a schematic of a system 100 that allows a transaction between a telecommunication service provider 108 and a merchant 102. The telecommunication service provider 108 provides a subscriber 110, registered with the telecommunication service provider 108, access to telephone and related communications services. Each registered subscriber 110 may be identified using, for example, the subscriber's mobile telephone number. The merchant 102 may be a business offering goods or services being the subject of the transaction with the telecommunication service provider 108. The goods include tangible products (such as clothes and groceries) and intangible products (such as software applications) for installation into a computing platform (such as a mobile phone). The transaction involves the purchase of goods or services offered by the merchant 102, with the purchase being initiated by the registered subscriber 110. The transaction may be

performed electronically, such as over the Internet, with no need for the registered subscriber 110 to physically visit the merchant 102 to complete the transaction. The merchant 102 also receives immediate payment for the transaction, not from the registered subscriber 110, but rather, from the telecommunication service provider 108 through the payment network provided by an acquirer 104 and a server 106 (described in further detail below). Accordingly, the merchant 102 may include one or more computer terminals/servers to process such an electronic transaction.

[020] The system 100 further includes an acquirer 104 and a server 106 to facilitate the transaction between the merchant 102 and the telecommunication service provider 108.

[021] The acquirer 104 is a party that determines whether the merchant 102 meets the criteria that allows for the merchant 102 to use the infrastructure provided by the financial services provider to which the server 106 belongs. The acquirer 104 processes transactions that the registered subscriber 110 makes with the merchant 102 and performs financial settlement between the telecommunication service provider 108 and the acquirer 104 through the server 106.

[022] The server network, to which the server 106 belongs, provides the architecture that facilitates the transaction between the telecommunication service provider 108 and the merchant 102, where the transaction is initiated by a subscriber 110 registered with the telecommunication service provider 108. The server 106 facilitates the transaction by recognising, amongst all processed transactions, those that are made by the subscriber 110 registered with the telecommunication service provider 108. Such recognition may be performed as described in what follows, being a preferred implementation of a transaction between the telecommunication service provider 108 and the merchant 102.

[023] Consider a subscriber 110, who is a customer with the telecommunication service provider 108 and wishes to use the telecommunication service provider 108 as a source of funds to initiate a transaction. The subscriber 110 needs to register to the fund facility service that the telecommunication service provider 108 provides. The subscriber 110 may be identified to the telecommunication service provider 108 using a registration ID 112_1, such as the mobile telephone number of the subscriber 110. However, this registration ID 112_1 cannot be directly used by the registered subscriber 110 to perform transactions,

such as purchasing of goods or services, with a merchant 102 because the registration ID 112_1 is not recognised by the merchant 102. To perform such transactions with the merchant 102, the transactions need to be made against an electronic format that the merchant recognises. An exemplary electronic format would be an account number 116_1 in a configuration recognisable by the merchant 102. Such an account number 116_1 is issued to the subscriber 110 to be used against transactions made with the merchant 102, i.e., they provide the subscriber 110 with a payment instrument for transactions made with the merchant 102. In one exemplary implementation, the account number 116_1 is accessed from a mobile device (such as a smart phone) used by the subscriber 110. In such an implementation, the account number 116_1 may be provided by an electronic card used by an installed application in the mobile device. The electronic card may have a virtual card number. The account number 116_1 is in a format that when processed indicates that the transactions made against the account number 116_1 are to be paid by the telecommunication service provider 108 via the acquirer 104.

[024] However the account number 116_1 against which the transactions is made is not recognised by the telecommunication service provider 108, so that the transactions - paid for by the telecommunication service provider 108 - cannot be associated back to the registered subscriber 110 for billing purposes based on the account number 116_1 alone. To circumvent this, a unique reference 114_1 is used to map the registration ID 112_1 of the subscriber 110 to the account number 116_1 issued to the subscriber 110. The unique reference 114_1, which may be assigned by computing infrastructure 107 in communication with the server 106, allows for the identification of the subscriber 110 to which the account number 116_1 belongs because the telecommunication service provider 108 has a database 120 of unique references 114_1, …, 114_n, each assigned to a registration ID 112_1, …, 112_n of a respective subscriber 110. The unique reference 114_1 is processed against the database 120, where a match then identifies the subscriber 110 to which the account number 116_1 belongs. In one implementation, the unique reference 114_1 is generated by the computing infrastructure 107 and the unique reference 114_1 is assigned by the server 106. Accordingly, the server 106 is configured to assign a unique reference 114_1, …, 114_n that is used to map an account number 116_1, …, 116_n to the registration ID 112_1 assigned to the subscriber 110. As explained above,

the subscriber 110 is assigned his registration ID 112_1 by the telecommunication service provider 108, while a transaction with the merchant 102 is made against the account number 116_1 that is mapped to the registration ID 112_1 by way of the unique reference 114_1.

[025] During subscriber 110 registration, the following may occur. An account number issuance request may be made to the telecommunication service provider 108. The telecommunication service provider 108 sends the request to the computing infrastructure 107 requesting for an account number to be generated. The computing infrastructure 107 then generates the account number 116_1, against which the unique reference 114_1 is designated, and stores it together with the unique reference 114_1 for future exchange. The unique reference 114_1 is shared with the telecommunication service provider 108, through the server 106 or directly from the computing infrastructure 107. The telecommunication service provider 108 then assigns this unique reference 114_1 to the subscriber 110 registration ID 112_1. In this manner, the unique reference 114_1 maps the subscriber 110 to the account number 116_1. This process is repeated for each subscriber registration, so that the telecommunication service provider 108 is provided with a plurality of unique references 114_1, …, 114_n. By having the database 120 of unique references 114_1, …, 114_n, the telecommunication service provider 108 is configured to recognise the unique references (such as unique reference 114_1) that are assigned by the server 106. The mapping functionality provided by the unique references 114_1, …, 114_n is integral to facilitating a transaction funded by the telecommunication service provider 108 because they serve as data that is shared between the telecommunication service provider 108 and the computing infrastructure 107, which can be processed by both the telecommunication service provider 108 and the computing infrastructure 107. Due to the confidential and sensitive nature of registration ID 112_1, …, 112_n, they are typically prevented from being shared by regulations of a country in which the telecommunication service provider 108 is located. Similarly, the account number 116_1, …, 116_n, is also restricted data that is not shared by the computing infrastructure 107 to another party. Thus the unique references 114_1, …, 114_n provide a means for communication between the computing infrastructure 107 and the telecommunication service provider 108 that

facilitates the transaction funded by the telecommunication service provider 108 to the merchant 102.

[026] After the subscriber 110 makes one or more transactions against the account number 116_1, the account number 116_1 and details 118 of the transaction are sent, via the acquirer 104 to the server 106 for processing. The details 118 of the transaction may include data that when processed provides information on the amount paid for the goods or services purchased from the merchant 102 and also a list of the goods or services purchased from the merchant 102. While Figure 1 shows an implementation having the account number 116_1 and details 118 of the transaction as two separate sets of data, an alternative implementation has the account number 116_1 being provided as part of the details 118 of the transaction.

[027] The account number 116_1 and details 118 of the transaction may be packaged into a data packet 126 that is first received by the acquirer 104 before being sent to the server 106. The server 106 may recognise the account number 116_1 as being in a format which facilitates a transaction between the telecommunication service provider 108 and the merchant 102. Upon receiving use of the account number 116_1 for the transaction, through receipt of the data packet 126, the server 106 sends the data packet 126 to be processed by the computing infrastructure 107. The computing infrastructure 107 performs the mapping and sends the unique reference 114_1, along with details 118 of the transaction, as a data packet 128 to the telecommunication service provider 108, via the server 106. Accordingly, the unique reference 114_1 and details 118 of the transaction are transmitted by the server 106 to the telecommunication service provider 108.

[028] When the telecommunication service provider 108 receives details 118 of the transaction and the unique reference 114_1 assigned to the account number 116_1 against which the transactions were made, the unique reference 114_1 is processed against the database 120 of unique references 114_1, …, 114_n to identify the subscriber 110 to which the account number 116_1 belongs. After the subscriber 110 is identified, the telecommunication service provider 108 releases payment for the transactions through the acquirer 104 and the server 106, as depicted using the arrows labeled with the reference numeral 124. The details of the transaction 118 are also associated 122 to the identified subscriber 110 for subsequent billing.

[029] Use of the term ‘server’ herein may be understood to mean a single computing device or a plurality of interconnected computing devices which operate together to perform a particular function. That is, the server may be contained within a single hardware unit or be distributed among several or many different hardware units.

[030] Figure 2 shows an exemplary computing device 200, to realize the computing infrastructure 107 supporting the server 106 shown in Figure 1. The following description of the computing device 200 is provided by way of example only and is not intended to be limiting. Therefore, one or more elements / components of the computing device 200 may be omitted. Also, one or more elements / components of the computing device 200 may be combined together. Additionally, one or more elements / components of the computing device 200 may be split into one or more component parts.

[031] With reference to Figure 2, the exemplary computing device 200 includes a processor 204 for executing software routines. Although a single processor is shown for the sake of clarity, the computing device 200 may also include a multi-processor system. The processor 204 is connected to a communication infrastructure 206 for communication with other components of the computing device 200. The communication infrastructure 206 may include, for example, a communications bus, cross-bar, or network.

[032] The computing device 200 further includes a main memory 208, such as a random access memory (RAM), and a secondary memory 210. The secondary memory 210 may include, for example, a hard disk drive 212 and/or a removable storage drive 214, which may include a floppy disk drive, a magnetic tape drive, an optical disk drive, or the like. The removable storage drive 214 reads from and/or writes to a removable storage unit 218 in a well-known manner. The removable storage unit 218 may include a floppy disk, magnetic tape, optical disk, or the like, which is read by and written to by removable storage drive 214. As will be appreciated by persons skilled in the relevant art(s), the removable storage unit 218 includes a computer readable storage medium having stored therein computer executable program code instructions and/or data.

[033] In an alternative implementation, the secondary memory 210 may additionally or alternatively include other similar means for allowing computer programs

or other instructions to be loaded into the computing device 200. Such means can include, for example, a removable storage unit 222 and an interface 250. Examples of a removable storage unit 222 and interface 250 include a program cartridge and cartridge interface (such as that found in video game console devices), a removable memory chip (such as an EPROM or PROM) and associated socket, and other removable storage units 222 and interfaces 250 which allow software and data to be transferred from the removable storage unit 222 to the computing device 200.

[034] The computing device 200 also includes at least one communication interface 224. The communication interface 224 allows software and data to be transferred between computing device 200 and external devices via a communication path 226. In various embodiments of the disclosure, the communication interface 224 permits data to be transferred between the computing device 200 and a data communication network, such as a public data or private data communication network. The communication interface 224 may be used to exchange data between different computing devices 200 which such computing devices 200 form part an interconnected computer network. Examples of a communication interface 224 can include a modem, a network interface (such as an Ethernet card), a communication port, an antenna with associated circuitry and the like. The communication interface 224 may be wired or may be wireless. Software and data transferred via the communication interface 224 are in the form of signals which can be electronic, electromagnetic, optical or other signals capable of being received by communication interface 224. These signals are provided to the communication interface via the communication path 226.

[035] As shown in Figure 2, the computing device 200 further includes a display interface 202 which performs operations for rendering images to an associated display 230 and an audio interface 232 for performing operations for playing audio content via associated speaker(s) 234.

[036] As used herein, the term "computer program product" may refer, in part, to removable storage unit 218, removable storage unit 222, a hard disk installed in hard disk drive 212, or a carrier wave carrying software over communication path 226 (wireless link or cable) to communication interface 224. A computer readable medium can include magnetic media, optical media, or other recordable media, or media that transmits a carrier wave or other signal. These computer program products are devices for providing software to the computing device 200.

[037] The computer programs (also called computer program code) are stored in main memory 208 and/or secondary memory 210. Computer programs can also be received via the communication interface 224. Such computer programs, when executed, enable the computing device 200 to perform one or more steps that initiate the transaction between a service provider and a merchant (such as the telecommunication service provider 108 and the merchant 102 described above with reference to Figure 1). The computer programs, when executed, enable the processor 204 to facilitate the transaction between the service provider and the merchant through the payment network provided by an acquirer and a server. Accordingly, such computer programs may represent controllers of the computing device 200.

[038] Software may be stored in a computer program product and loaded into the computing device 200 using the removable storage drive 214, the hard disk drive 212, or the interface 250. Alternatively, the computer program product may be downloaded to the computing device 200 over the communications path 226. The software, when executed by the processor 204, causes the computing device 200 to perform the necessary operations to execute the method as shown in Figure 3.

[039] With reference to Figure 2, the method according to the flow chart shown in Figure 3 may be implemented as software and stored in a non-transitory fashion in the secondary memory 210 or the removable storage units 218, 222 of the computing device 200. The software is executable by the processor 204 of the computing device 200. The method allows for the conducting of the transaction between a service provider and a merchant (see the telecommunication service provider 108 and the merchant 102 of Figure 1), through a payment network provided by an acquirer and a server (see the acquirer 104 and the server 106 of Figure 1). The method includes the following steps as detailed below.

[040] Now turning to Figure 3, in step 302, an account number, against which a transaction with a merchant is made, is issued. The account number belongs to a subscriber registered with the service provider. A registration ID may identify the subscriber registered with the service provider and with reference to Figure 2, one implementation has the account number issued by the processor 204. Issuance of the account number by the processor 204 may be initiated by the service provider, for example when the subscriber requests from the service provider that this account number be created. The service provider will then send a

message to the processor 204 to issue and provide the subscriber with the account number.

[041] In step 304, a unique reference, used to map the subscriber to the account number, is assigned. With reference to Figures 1 and 2, the unique reference may be assigned by the processor 204, where the processor 204 may also perform the mapping.

[042] In step 306, upon receiving use of the account number for the transaction, the unique reference and details of the transaction are transmitted to the service provider. With reference to Figures 1 and 2, the processor 204 may transmit the unique reference and details of the transaction to the service provider. The unique reference is then processed against a database of unique references to identify the subscriber to which the account number belongs. This allows for the service provider to associate the transaction to the identified subscriber, based on the details of the transaction.

[043] In one implementation which uses an application based service and where the service provide is a telecommunication service provider, the transaction effected by the method of Figure 3 is accessed through any communication device, such as a smart phone, which is provided with the account number of step 302 of Figure 3. The account number may be made available to the mobile device from installing a software application that is configured to allow the mobile device to participate in the transaction brought about by the method of Figure 3. The account number may be stored in the mobile device in the form of a virtual electronic card configured to facilitate the method of Figure 3. However, the method of Figure 3 may be implemented using any other channels such as SMS and e-mail, where the account number may be stored in any suitable electronic format. Thus, the method described in Figure 3 may give a subscriber to a telecommunication service provider a cashless payment option for purchases made through their mobile device. This additional mode of cashless payment is advantageous especially for software applications that are designed for a smart phone operating system because making the telecommunication service provider (against which the smart phone is registered) the immediate payment party to the merchant offering the software applications allows the telecommunication service provider to provide a further

service to the smart phone user, in addition to allowing the smart phone to access telephone and related communications services.

[044] With the telecommunication service provider being able to extend the credit line required from websites before a purchased good is released, the method of Figure 3 thus allows access to a pool of telecommunication service provider subscribers that do not own a credit or debit card or do not wish to provide details of their credit or debit card when making website purchases. A holder of a credit card account can also utilise the method of Figure 3 by having the credit line drawn from the telecommunication service provider, rather than from an issuer of the credit card account.

[045] From associating the transaction back to the subscriber that made the purchase, the telecommunication service provider may be reimbursed in one of two exemplary ways. In a first example, where the subscriber uses a prepaid service with the telecommunication service provider, the purchases may be directly deducted from the balance in the prepaid account. In a second example, the purchases that are made may appear in a monthly telecommunication bill that is issued by the telecommunication service provider to the registered subscriber (also known as “direct carrier billing”).

[046] Direct carrier billing implemented by a known application, such as “Google Play” from Google™ is as follows. After the “Google Play” application from Google Play™ store is installed into a smart phone, the “Google Play” application allows for direct carrier billing of subsequent applications purchased from the Google Play™ store. However, direct carrier billing provided by Google™ has the following drawbacks. The “Google Play” application is not open source and requires time consuming and complicated integration of servers operated by a telecommunication service provider in order for the telecommunication service provider servers to be compatible with the protocol used by Google™. If Google™ were to implement direct carrier billing with a telecommunication service provider, Google™ server protocol would need to be adapted to be compatible with that of the telecommunication service provider. Since each telecommunication service provider uses its own set of protocols, this adaptation would have to be conducted each time Google™ implements direct carrier billing with a new telecommunication service provider, making it impractical. Further, goods sold on Google Play™ are

mainly listed in USD currency. If Google™ connects with a telecommunication service provider that does not transact in USD for direct carrier billing, such goods are listed in the local currency where the telecommunication service provider is based. Thus, currency risk is borne by Google™ when Google™ is paid in such local currency, instead of USD currency.

[047] The method of Figure 3 eliminates both the integration effort and FX risk mentioned above. Firstly (with reference to Figure 1), simple, easy to integrate open protocols can be published that can enable a telecommunication service provider 108 to integrate their billing platform to the computing infrastructure 107, which in turn, is integrated with the server 106. These protocols configure the telecommunication service provider 108 to be able to recognise received data packets 128 that contain the unique references 114_1, …, 114_n that identify such data packets 128 to relate to transactions that are for direct carrier billing, which triggers the telecommunication service provider 108 to make payment to the merchant 102 with which the transactions are made. The protocols also adapt the telecommunication service provider 108 to have a database 120 of such unique references 114_1, …, 114_n. There is no integration required by the merchant 102 to utilise direct carrier billing provided by the method of Figure 3. This is because the configuration and adaptation described above affects the telecommunication service provider 108 and the server 106; the interface between the merchant 102 and the network of the acquirer 104 and the server 106 is not affected. The source of funds used to pay the merchant 102 for purchased goods does not affect payment to the merchant 102. Accordingly in the case of Google Play™ store being the merchant 102, it will still be paid in USD.

[048] Returning to Figure 1, in one implementation, the issuance of an account number 116_1, assignment of the unique reference 114_1 and transmission of the unique reference 114 may be performed by a common server, such as the server 106 through the computing infrastructure 107. The account number 116_1 may be issued by the common server (i.e., the server 106) upon request by the telecommunication service provider 108. This could occur, for example, when the subscriber 110 requests the telecommunication service provider 108 to provide an account number that can facilitate a transaction between the telecommunication service provider 108 and the merchant 102. The telecommunication service

provider 108 will then request for the server 106 to generate and transmit the account number 116_1 to the subscriber 110.

[049] At the computing infrastructure 107, the account number 116_1 may be replaced with the unique reference 114_1, …, 114_n before transmitting the unique reference 114_1, …, 114_n and the details 118 of the transaction. The account number 116_1 is sensitive payment information and entities storing this information have to be compliant with Payment Card Industry Data Security Standards (PCIDSS). As the telecommunication service provider 108 is typically not configured to store such sensitive payment information, the account number 116_1 is replaced with the unique reference number 114_1 and it is the unique reference 114_1 that is sent to the telecommunication service provider 108. The computing infrastructure 107, connected to the server 106, is a PCIDSS compliant entity and hence stores the account number 116_1.

[050] When the telecommunication service provider 108 receives the data packet 128, it may be configured to determine a fund, to which the transaction is associated, from the format of the unique reference 114_1, …, 114_n. For instance, each of the unique references 114_1, …, 114_n may contain a data field, which when processed, indicates the fund against which the transaction is to be billed. The fund may be a prepaid balance, such as a stored value card registered with the telecommunication service provider 108; or a credit line, such as a post-paid account against which a monthly telecommunication bill to the subscriber 110 is based. When billing the transaction to the identified subscriber 110, the computing infrastructure 107 may be configured to include a buffer for currency conversion when the transaction is in a currency different from the one used by the telecommunication service provider 108. This buffer allows for the computing infrastructure 107 to protect itself against currency exchange fluctuations that occur between the point when the transaction with the merchant 102 occurs to the point when the identified subscriber 110 is made to reimburse the telecommunication service provider 108 for payment made by the telecommunication service provider 108 to the merchant 102.

[051] The format of the assigned unique reference 114_1 may depend on the telecommunication service provider 108 to which the subscriber 110 is registered. Thus for a first telecommunication service provider, the assigned unique reference

may have a first format, while for a second telecommunication service provider, the assigned unique reference may have a second format. Thus, in addition to indicating the fund against which the transaction is to be billed, the format of the assigned unique reference 114_1 also indicates to the telecommunication service provider 108 whether the data packet 128 is meant for the telecommunication service provider 108. Accordingly, the server 106, through the computing infrastructure 107, is able to distinguish transactions between different telecommunication service providers 108 (although only one telecommunication service provider 108 is shown in Figure 1) and the merchant 102, by assigning unique references 114_1, …, 114_n that are in formats acceptable to the respective telecommunication service provider 108.

[052] Figure 4 shows a schematic of a server network 406 that includes both the server 106 and the computing infrastructure 107 of the system 100 of Figure 1. The computing infrastructure 107 includes at least one processor 404 and at least one memory 408. Other components that the server network 406 may have are omitted for the purposes of simplicity.

[053] The server 106 facilitates, through the computing infrastructure 107, a transaction between a telecommunication service provider 108 and a merchant 102. The role of the computing infrastructure 107 is to establish a process that links an account number 116_1, against which the transaction is made, to the registration ID 112_1 of a subscriber with the telecommunication service provider 108, the account number 116_1 being issued to the subscriber to whom the registration ID 112_1 belongs. This link is established as follows. Computer program code within the at least one memory 408 is configured to have the at least one memory 408, with the at least one processor 404, cause the computing infrastructure 107 at least to: assign 430 a unique reference 114_1 that is used to map the account number 116_1 issued to the subscriber registered with the telecommunication service provider 108. As mentioned above, the transaction with the merchant 102 is made against the account number 116_1. The computer program code then has the at least one memory 408 and the at least one processor 404 cause the computing infrastructure 107 to transmit 440, upon receiving use of the account number 116_1 for the transaction, the unique reference 114_1 and details 118 of the transaction to the telecommunication service provider 108. At the telecommunication service provider

108, the unique reference 114_1 is processed against a database 120 of unique references 114_1, …, 114_n to identify the subscriber to which the account number 116_1 belongs, for the telecommunication service provider 108 to associate the details 118 of the transaction to the identified subscriber.

[054] A further role of the server 106, through the computing infrastructure 107, may be to issue the account number 116_1 against which the transaction is made. To achieve such a role, the at least one memory 408 and the computer program code are further configured to, with the at least one processor 404, cause the server 106 to issue the account number 116_1 against which the transaction with the merchant 102 is made before the assignment of the unique reference 114_1.

[055] Figure 5 shows a sequence of steps that may occur to have a subscriber register with a telecommunication service provider (confer the telecommunication service provider 108 of Figure 1) that allows the transaction described with respect to Figure 3.

[056] In step 502, the subscriber sends a request to the telecommunication service provider. An account number (confer account number 116_1 of Figure 1), which may be provided by a virtual card, may then be created by a server system (confer the server 106 of Figure 1 and the computer infrastructure 107), where purchases from a merchant are made against the account number.

[057] In step 504, the subscriber may be authenticated to be registered with the telecommunication service provider before the subscriber is issued the account number. Such authentication may require the subscriber to enter his mobile PIN, or another authentication process that is determined by the telecommunication service provider 108.

[058] In step 506, the subscriber is provided with the account number, where the subscriber will then be registered with the telecommunication service provider as being able to participate in the program where the telecommunication service provider makes immediate payment to the merchant for purchases made by the subscriber from the merchant. In one implementation, it may be required that the subscriber already has established a stored value account with the telecommunication service provider before registration of step 506 is allowed, such as a prepaid airtime wallet or a credit line in the case of a post-paid subscriber. In such an implementation, the subscriber may be prompted to create such a stored value

account, if there is none, before allowing the registration of step 506. The account number will be linked to this stored value account in the manner described with reference to Figure 4 (i.e., by way of a unique reference), which establishes a connection between the party that issues the account number (which, when referring to Figure 1, may be the server 106 or the telecommunication service provider 108) and the stored value account. In one implementation, the account number may be configured to be only usable at merchants, such as the Google Play™ store, iTunes™ store, or any merchant store that requires payment instrument registration and sells digital goods.

[059] In step 508, the subscriber may then enrol the account number for purchases, such as software applications or digital goods from merchant stores, where the purchases are eventually funded from their airtime wallet (for a prepaid consumer) or billed to their credit line (for a post-paid consumer).

[060] Figure 6 shows a schematic of a server 608 at the telecommunication service provider 108 of the system 100 of Figure 1. The server 608 includes at least one processor 604 and at least one memory 608. Other components that the server 608 may have are omitted for the purposes of simplicity.

[061] The server 608 conducts a transaction with a merchant 102, where the transaction is initiated by a subscriber registered with the telecommunication service provider 108. Computer program code within the at least one memory 608 is configured to have the at least one memory 608, with the at least one processor 604, cause the telecommunication service provider server 608 to receive 620 details 118 of the transaction and a unique reference 114_1 assigned to an account number against which the transaction is made. The unique reference 114_1 is used to map the account number 116_1 (see Figure 4) to the subscriber, registered with the telecommunication service provider 108, to which the account number 116_1 belongs. The computer program code then has the at least one memory 608 and the at least one processor 604 process the unique reference 114_1 against a database 120 of unique references 114_1, …, 114_n to identify the subscriber to which the account number 116_1 belongs; and associate the details 118 of the transaction to the identified subscriber. In one implementation, the subscriber is registered with the telecommunication service provider 108 using a the registration ID 112_1, so that the

subscriber is identified from a list of registration IDs 112_1, …, 112_n that are stored in the database 120.

[062] Figure 7 shows a portion of the system 100 of Figure 1. Figure 7 shows the server 608 of Figure 6 in communication with the server network 406 of Figure 4. Accordingly the system 100 that allows a transaction between a telecommunication service provider 108 and a merchant 102 has a server network 406 in communication with a telecommunication service provider server 608. The server network 406 includes at least one processor 404 and at least one memory 408. The telecommunication service provider server 608 also includes at least one processor 604 and at least one memory 608. Other components that the system 100 may have are omitted for the purposes of simplicity.

[063] Computer program code within the at least one memory 408 is configured to have the at least one memory 408, with the at least one processor 404, cause the computer infrastructure 107 at least to assign a unique reference 114_1 that is used to map an account number 116_1 issued to a subscriber registered with the telecommunication service provider 108. The transaction with the merchant 102 is made against the account number 116_1. The computer program code then has the at least one memory 408 and the at least one processor 404 cause the computer infrastructure 107 to transmit, upon receiving use of the account number 116_1 for the transaction, the unique reference 114_1 and details 118 of the transaction to the telecommunication service provider 608.

[064] Computer program code within the at least one memory 608 is configured to have the at least one memory 608, with the at least one processor 604, cause the telecommunication service provider server 608 to receive the details 118 of the transaction and the unique reference 114_1. The computer program code then has the at least one memory 608 and the at least one processor 604 process the unique reference 114_1 against a database 120 of unique references 114_1, …, 114_n to identify the subscriber to which the account number belongs; and associate the details 118 of the transaction to the identified subscriber. In one implementation, the subscriber is registered with the telecommunication service provider 108 using a the registration ID 112_1, so that the subscriber is identified from a list of registration IDs 112_1, …, 112_n that are stored in the database 120.

[065] Any one or more of the unique references 114_1, …, 114_n may include any one or more of numbers, letters or symbols.

[066] Figure 8 shows the various stages of having the system 100 of Figure 1 perform a transaction with the merchant. Each stage is described below, with reference to Figure 1.

[067] In stage 802, a subscriber 110 selects, for example, a software application or content to be purchased from a merchant 102 through his smart phone. The subscriber 110 selects a virtual card that is used to fund his purchases.

[068] In stage 804, the merchant 102 submits details 118 of the transaction and the account number 116_1 of the virtual card used for the purchases, along with other transaction information, to the acquirer 104. The acquirer 104 then sends the details 118 of the transaction and the account number 116_1 to the server 106.

[069] In stage 806, the server 106 assigns a unique reference 114_1 that is used to map the subscriber 110 to the account number 116_1. Before passing on the details 118 of the transaction and the unique reference 114_1 to the telecommunication service provider 108 in stage 808, the following may occur. In one implementation, the server 106 may receive the details 118 of the transaction and the account number 116_1 in a message having first format (such as ISO 8583), where the server 106, through the computer infrastructure 107, may change the message into a second format (such as XML). The unique reference 114_1 may also replace the account number 116_1, so that only the unique reference 114_1 and the details 118 of the transaction are sent to the telecommunication service provider 108.

[070] In stage 808, the telecommunication service provider 108 uses the unique reference 114_1 to identify the subscriber 110 to which the account number 116_1 belongs. The unique reference 114_1 may also use the unique reference 114_1 to identify a fund that the subscriber 110 designates to pay for purchases performed using the system 100. For instance, the subscriber 110 may have a prepaid account, such as an airtime balance, which would then be reduced by the cost of the purchases. Alternatively, the subscriber 110 may have a post-paid account, such as a credit line, to which the purchases would be billed. The telecommunication service provider 108 then confirms to the server 106 that the transaction is approved, so that payment can be released to the merchant 102

[071] In stage 810, the merchant 102 receives payment for the transaction from the acquirer 104. The purchased goods or services are thus delivered to the subscriber 110.

[072] It will be appreciated by a person skilled in the art that numerous variations and/or modifications may be made to the present disclosure as shown in the specific embodiments without departing from the spirit or scope of the disclosure as broadly described. The present embodiments are, therefore, to be considered in all respects to be illustrative and not restrictive.

CLAIMS

1. A method by a system comprising a server network, a service provider server and a merchant server for facilitating a transaction between a service provider corresponding to the service provider server and a merchant corresponding to the merchant server, the method comprising:

generating, by the server network, an account number to a subscriber registered with the service provider, the account number corresponding to a registration ID that the subscriber has with the service provider and suitable for making a transaction with the merchant;

generating, by the server network, a unique reference corresponding to the account number, the unique reference mapping the subscriber to the account number;

transmitting, by the server network, upon receiving use of the account number for the transaction, the unique reference to the service provider server;

identifying, by the service provider server, the subscriber to which the account number belongs, in response to the transmitted unique reference; and

associating, by the service provider server, the transaction to the registration ID of the identified subscriber so as to facilitate the transaction with the merchant.

2. The method of claim 1, wherein the server network comprises a server and a computing infrastructure, and wherein generating the account number, generating the unique reference and transmitting the unique reference are performed by the computing infrastructure.

3. The method of claim 1 or 2, further comprising receiving, by the server network, a request from the service provider server for generating the account number, wherein the account number is generated by the server network in response to the request.

4. The method of any of the preceding claims, further comprising replacing, by the server network, the account number with the unique reference before

transmitting the unique reference and details of the transaction to the service provider server.

5. The method of any of the preceding claims, further comprising determining, by the service provider server, a fund, to which the transaction is associated, from the format of the unique reference.

6. The method of claim 5, wherein the fund is a prepaid balance or a credit line.

7. The method of any of the preceding claims, wherein the format of the unique reference depends on the service provider to which the subscriber is registered.

8. The method of any of the preceding claims, further comprising authenticating that the subscriber is registered with the service provider before generating the account number .

9. The method of any of the preceding claims, wherein billing of the transaction to the identified subscriber comprises including, by the service provider server, a buffer for currency conversion when the transaction is in a currency different from the one used by the server network that facilitates the transaction between the merchant and the service provider.

10. The method of any of the preceding claims, wherein the account number is a virtual card number that is used by an installed application in a mobile device.

11. The method of any of the preceding claims, wherein the unique reference comprises any one or more of numbers, letters or symbols.

12. The method of any of the preceding claims, wherein the service provider is any one or more of a telecommunication service provider, a financial services provider or an online service provider.

13. A service provider server for facilitating a transaction with a merchant corresponding to a merchant server, the service provider server corresponding to a service provider and comprising:

at least one processor; and

at least one memory including computer program code;

the at least one memory and the computer program code configured to, with the at least one processor, cause the service provider server at least to:

receive a unique reference generated corresponding to an account number suitable for making a transaction with the merchant, the account number being generated to a subscriber registered with the service provider and corresponding to a registration ID that the subscriber has with the service provider, the unique reference mapping the account number to the subscriber,

identify the subscriber to which the account number belongs in response to the received unique reference, and

associate the transaction to the registration ID of the identified subscriber so as to facilitate the transaction with the merchant.

14. A server network for facilitating a transaction between a service provider corresponding to a service provider server and a merchant corresponding to a merchant server, the server network comprising:

at least one processor; and

at least one memory including computer program code;

the at least one memory and the computer program code configured to, with the at least one processor, cause the server network at least to:

generate a unique reference that is used to map an account number generated corresponding to a subscriber registered with the service provider, the account number corresponding to a registration ID that the subscriber has with the service provider and suitable for making a transaction with the merchant, and

transmit, upon receiving use of the account number for the transaction, the unique reference to the service provider server, wherein the subscriber to which the account number belongs is identified by the service provider server in response to the transmitted unique reference, and the transaction is associated by the service

provider server to the registration ID of the identified subscriber so as to facilitate the transaction between the service provider and the merchant.

15. The server of claim 13, wherein the at least one memory and the computer program code are further configured to, with the at least one processor, cause the server network to generate the account number suitable for making the transaction with the merchant before the generation of the unique reference.

16. A system comprising a server network, a service provider server, and a merchant server for facilitating a transaction between a service provider corresponding to the service provider server and a merchant corresponding to the merchant server, wherein the server network comprises:

at least one processor; and

at least one memory including computer program code;

the at least one memory and the computer program code configured to, with the at least one processor, cause the server network at least to generate a unique reference that is used to map an account number generated to a subscriber registered with the service provider, the account number corresponding to a registration ID that the subscriber has with the service provider and suitable for making a transaction with the merchant; and transmit, upon receiving use of the account number for the transaction, the unique reference to the service provider server; and

wherein the service provider server comprises:

at least one processor; and

at least one memory including computer program code;

the at least one memory and the computer program code configured to, with the at least one processor, cause the service provider server at least to receive the unique reference; identify the subscriber to which the account number belongs in response to the received unique reference; associate the transaction to the registration ID of the identified subscriber so as to facilitate the transaction with the merchant.