DATA INPUT TO REAL-TIME ACCOUNTING SOFTWARE

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of US Provisional Application Serial No. 63/333,712, filed April 22, 2022, the contents of which are incorporated herein in their entirety.

FIELD OF THE DISCLOSURE

[0002] The present invention relates to a system, method and computer program for inputting and processing data for real-time autonomous accounting.

BACKGROUND OF THE DISCLOSURE

[0003] Credit/debit transactions may be conducted electronically and are often contactless, but generally still result in a paper or email receipt. Today, when one pays contactless with a credit/debit card or phone electronic payment application, paper or email bills and paper or email receipts are generated. Other contactless transactions include person-to-person payments facilitated by systems such as PayPal or Venmo. Tap-to-pay or contactless payments are enabled by new technology in payment terminals. With Near Field Communication (NFC), credit cards and digital wallets on a smartphone or smartwatch can complete purchases with something as simple as a tap on a screen or holding the payment device close to a payment terminal.

[0004] Contactless transactions are convenient for the user at the time of the transaction, but the following accounting tasks can be daunting as the number of contactless transactions increases. Paper and email receipts create overwhelming data entry issues for account monitoring, management and reconciliation. The most expensive and time-consuming operations in reconciliation accounting is the collection and data entry from those paper and email receipts. Data entry is expensive and often unreliable to outsource and/or too fiddly and time consuming to do personally. Email and paper receipts are difficult to process and they end up being manually entered, if at all. Verification of transactions is so difficult that most people never properly check their spending. Full and regular accounts reconciliations are too much bother. As a result, most people simply do not bother reconciling their accounts, leading to poor money management and late awareness of fraud or misuse, leaving them vulnerable to loss from overcharging scams, fraudulent payments and digital theft.

SUMMARY OF THE DISLCOSED SUBJECT MATTER

[0005] Provided is a new generation of application that is completely intuitive and fully integrated, for the very first time providing genuine real-time accounting capability through the

ascendency of a powerful processing protocol. It specifically resolves the difficulties of post-transaction accounting of contactless payments.

[0006] One aspect provides a system for transaction data processing, comprising one or more processors; and a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the one or more processors, causes the one or more processors to communicate payment information and a unique identifier associated with a user to a merchant for a transaction for auto attribution; translate detailed transaction information into XML; and communicate the detailed transaction information to an accounting domain server with attribution based on the unique identifier.

[0007] Embodiments of thesystem include the following, alone or in any combination.

[0008] The computer readable instructions may further cause the one or more processors to direct the accounting domain server to check payments versus receipts; maintain detailed records of transactions reconcile accounts; or generate reports to a user.

[0009] The system may comprise a device configured to communicate with a payment terminal to conduct transactions via near-field communications; a user interface to communication information between the controller and the user; and a display to display information to the user.

[0010] The system may comprise a device associated with a user, the user-associated device comprising a processor and a communications module; and a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the processor, causes the processor to transmit an account number for a credit account, line of credit or debit account associated with the user when the user desires to purchase a good or service to a device associated with a merchant; transmit a personal identifier associated with the user to the device associated with the merchant; transmit to the device associated with the merchant instructions to provide data associated with a transaction for purchase of the good or service linked to the personal identifier; and receive data associated with the transaction for purchase of the good or service linked to the personal identifier from the device associated with the merchant; and communicate the data associated with the transaction to an accounting domain server.

[0011] The device associated with the user may be further configured to translate the data associated with the transaction for purchase of the good or service linked to the personal identifier into XML format for communication to and storage by the accounting domain server.

[0012] The device associated with the user may comprise a mobile phone, fob, smart watch, tablet, or personal computer.

[0013] The system may comprise a first device for autonomous transaction data processing, the first device comprising a processor and a communications module; and a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the processor, causes the processor to receive from a merchant data associated with a transaction for purchase of a good or service; receive an account number for a credit account, line of credit or debit account associated with a user desiring to purchase the good or service; receive a personal identifier associated with the user; communicate the data associated with the transaction and the account number to an approver and receive from the approver approval for the transaction authorizing the merchant to complete the transaction; and communicate the data associated with the transaction and the approval to a second device associated with the personal identifier of the user.

[0014] The communications module of the first device may comprise near field communication functionality to receive the personal identifier from the second device and communicate the data associated with the transaction and the approval to the second device.

[0015] The first device may comprise a display configured to display visually data associated with the transaction to the user.

[0016] The first device may comprise a keypad configured to manually enter the personal identifier and communicate it to the processor.

[0017] The system may comprise a distributed network comprising a plurality of first devices associated with a plurality of merchants and a server in communication with the plurality of first devices, wherein the server comprises a central processor and a central communications module; and a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the processor, causes the central processor to receive data associated with a plurality of transactions from the plurality of first devices, wherein data associated with each transaction include a purchase price, an account number of a user and a personal identifier of the user and one of the plurality of first devices where each transaction was entered; communicate the data associated with the plurality of transactions to an approver; receive from the approver a plurality of approvals for the plurality of transactions, wherein each approval of the plurality of transactions is associated with the one of the plurality of

first devices where the transaction was entered; transmit each approval to the one of the plurality of first devices where the transaction was entered, wherein approval for each transaction authorizes the merchant where the transaction was entered to complete the transaction; and instruct the first device associated with the transaction to communicate the data associated with the transaction and the approval to a remote device associated with the personal identifier of the user.

[0018] Another aspect provides a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon wherein the instructions, when executed by a controller of a device comprising a processor and a communications module, causes the controller to communicate payment information and a unique identifier associated with a user to a merchant for a transaction for auto attribution; translate detailed transaction information into XML; and communicate the detailed transaction information to an accounting domain server with attribution based on the unique identifier.

[0019] Embodiments of the non-transitory computer readable storage medium include the following, alone or in any combination.

[0020] The computer readable instructions may cause the controller to direct the accounting domain server to check payments versus receipts; maintain detailed records of transactions reconcile accounts; or generate reports to a user.

[0021] The device is associated with a user, and the instructions further cause the processor to transmit an account number for a credit account, line of credit or debit account associated with the user when the user desires to purchase a good or service to a device associated with a merchant; transmit a personal identifier associated with the user to the device associated with the merchant; transmit to the device associated with the merchant instructions to provide data associated with a transaction for purchase of the good or service linked to the personal identifier; and receive data associated with the transaction for purchase of the good or service linked to the personal identifier from the device associated with the merchant; and communicate the data associated with the transaction to an accounting domain server.

[0022] The device associated with the user may be further configured to translate the data associated with the transaction for purchase of the good or service linked to the personal identifier into XML format for communication to and storage by the accounting domain server.

[0023] Another aspect provides a method for transaction data processing executed by a by one or more processors in a computerized system, the method comprising the one or more processors

communicating payment information and a unique identifier associated with a user to a merchant for a transaction for auto attribution; translating detailed transaction information into XML; and communicating the detailed transaction information to an accounting domain server with attribution based on the unique identifier.

[0024] Embodiments of the method include the following, alone or in any combination.

[0025] The method may further comprise the one or more processors directing the accounting domain server to check payments versus receipts; maintain detailed records of transactions reconcile accounts; or generate reports to a user.

[0026] The method of may comprise communicating payment information and a unique identifier associated with a user from a first device associated with the user to a second device associated with a merchant for a transaction; receiving by the first device data associated with the transaction from the second device; translating data associated with the transaction into XML format; communicating the data associated with the transaction to an accounting domain server; attributing the transaction to a category based on data associated with the transaction and the unique identifier; and recording the attributed transaction in a database in the accounting domain server.

[0027] The method may further comprise providing data associated with the attributed transaction to the user.

[0028] The method may comprise displaying the data associated with the attributed transaction to the user visually on an interactive display; and optionally receiving instructions from the user to modify data associated with the attributed transaction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] The disclosed aspects are described herein in conjunction with the appended drawings, provided to illustrate and not to limit the disclosed aspects, wherein like designations denote like elements.

[0030] Figure 1 depicts a schematic flow scheme of conventional credit card data exchanges among merchants service providers and banks.

[0031] Figure 2 depicts data exchanges between the credit card and bank for each credit card transaction.

[0032] Figure 3 shows a schematic illustration of the new paradigm for data processing according to an exemplary embodiment of the disclosed subject matter.

[0033] Figure 4 depicts a method for processing data associated with a transaction according to an exemplary embodiment of the disclosed subject matter.

[0034] Figure 5 depicts a display on a mobile phone that summarizes transactions processed according to an exemplary embodiment of the disclosed subject matter.

[0035] Figure 6 depicts a distributed network for communicating and storing data associated with transactions according to an exemplary embodiment of the disclosed subject matter.

[0036] Figure 7 depicts a system architecture for a computer system for communicating and storing data associated with transactions according to an exemplary embodiment of the disclosed subject matter.

[0037] Figure 8 depicts a hardware architecture for a computer system for communicating and storing data associated with transactions according to an exemplary embodiment of the disclosed subject matter.

DETAILED DESCRIPTION THE DISLCOSED SUBJECT MATTER

[0038] Described herein is a Link Environmental Integration Language Application (LEILA) using an Accounting Link Inter-device Access (ALIA) protocol. LEILA is a next-generation application that is completely intuitive and fully integrated, for the first time providing genuine real-time accounting capability through the agency of the unique and powerful ALIA protocol.

[0039] Paper bills and receipts are tangible objects with transaction information visible to users, but not digitally. This requires transcribing the visual information to a digital format suitable for entry into an electronic data processing and accounting format for each paper receipt. This may be accomplished by manual entry by the user or by scanning with an application with optical character reading (OCR) recognition capabilities. Although email bills and receipts are in digital format, they suffer from similar problems. Email receipts are difficult to regroup and may also require scanning with OCR recognition or manual entry into the electronic accounting system. Further, because they exist in the digital environment they are vulnerable to hackers who could easily tamper with them.

[0040] Conventional transaction processing is outlined in Figure 1. At step 1, a customer presents a credit card to purchase a good or service from a seller. This can happen via in-store, on-line, phone or mobile devices. The transaction includes a price at which the good or service is offered, which may include a percentage off or a coupon code that defines a discounted price. Presentation of the credit card indicates the customer accepts the offered price. The transaction

may also include information identifying the good or service for accounting in the seller's inventory control system and providing to the customer in the form of an electronic or hard (paper) receipt. At step 2, the amount of the purchase is transmitted to a payment processing service provider (PPSP). At step 3, the PPSP forwards the information to the credit card association (CCA) administering the presented credit card, such as Visa or Mastercard. The CCA sends the request to the issuing bank (step 4). The issuing bank approves or declines the transaction (step 5). The bank approves the transaction if the presented credit card has associated credit sufficient to cover the transaction amount, or declines the transaction if there is insufficient credit to cover the transaction amount. The approval (or decline) is returned to the CCA. The CCA sends the response to the PPSP (step 6). The PPSP forwards the response to the merchant (step 7). At step 8, the credit card payment is approved and the merchant receives an authorization number and completes the transaction with the customer. A receipt, which may be digital (such as by email) and/or paper is provided to the customer identifying the transaction. Alternatively, the transaction is declined, which is transmitted back through the CCA and PPSP to the merchant (seller), and the customer cannot purchase the good or service.

[0041] Figure 2 shows the data exchanges between the credit card and bank for each credit card transaction for a transaction conducted over the internet. There are at least 11 different exchanges of data for which there is poor or no reconciliation available for a consumer to verify the data exchanged in the background of the consumer's credit card transaction. The data exchanges include a customer accessing a merchant website at step 101 to find a good or service for purchase. The customer indicates a desire to make a purchase and provides credit card information to make the purchase. At step 102, the proposed transaction is communicated from the website to the merchant's payment gateway and at step 103 to the merchant's internet merchant account. These steps are initiated when the customer indicates the transaction is ready for processing, such as by clicking a "purchase" button on the website. In some instances, the payment gateway and internet merchant's account may be embodied in a single all-in-one service provider, similar to a payment processing service provider (PPSP). In steps 104, 105, 106 and 107, the CCA and the credit card issuing bank exchange information about the transaction, approve (or disapprove) the transaction, and authorization for the transaction is returned to the internet merchant account from the CCA. Steps 108 and 109 communicate the authorization to the website for the website to inform the customer the transaction is approved at step 110. In step 111, the

internet merchant account informs the merchant's bank that funds to cover the transaction have been received from the CCA. Funds may be moved from the internet merchant account to the merchant's bank account. Not shown in this figure are processes at the merchant and/or supplier level to process the order and arrange delivery of the good or service to the customer and fulfill the order.

[0042] One can appreciate that all these steps are processed electronically in the system so that a customer receives confirmation that the transaction has been approved almost immediately after initiating the process.

[0043] Despite all the electronic data processing occurring for each credit card transaction shown in Figures 1 and 2, an individual customer still receives only a paper and/or email receipt, so the customer faces the difficulty described above for entering transaction data into an electronic accounting system. Although presented generally herein as credit card transactions, where the purchase price is deducted from a line of credit for future payment by a customer, the same data exchanges would occur for debit transactions, wherein the purchase price is immediately deducted from a debit account holding a designated amount of available funds.

[0044] The fundamentals of the ALIA Protocol include creation of an Accounting Domains Server; use of XML language subset; and security of the match between payment and receipt. These fundamentals are embodied in an application (app) to guide the transaction, annotate it and account assignation. An Accounting Plan or Chart of Accounts setting the imputation by supplier type, bill type, expense type, etc. is a part of the application.

[0045] The ALIA Protocol has conceptualization rules including (1) each Accounting Domains Server has a Fix Internet Protocol Address or Static IP address aliased as a phone number; and has two options for linking the Fix Internet Protocol Address to the user interface. In one option, all accounts of the user (professional and private) are linked to the Fix Internet Protocol Address and in this case, the LEILA app makes the separation by asking the User which account to use. In the second option, one account of the user is linked to the Fix Internet Protocol Address and in this case the LEILA app makes the pre-imputation automatically and the final imputation by asking the User for approval.

[0046] Figure 3 shows a schematic illustration of a new paradigm for data flow using the LEILA and ALIA innovations. Using this paradigm, the transaction information is autonomously

captured as it is generated and entered directly into the autonomous accounting system. This results in a seamless data flow that eliminates the receipt transcription problem.

[0047] In a LEILA-instantiated transaction, the customer presents payment information including credit account number and telephone number (or other personal identifier) to the merchant for auto attribution for a proposed transaction at step 301. More detailed or split attribution can optionally be made via the app (step 309). In embodiments, the telephone number may be transmitted from a device 302 that may be a mobile phone (shown) or other device such as a payment fob or a smart watch to a merchant's payment terminal 303 as part of the NFC communications for the transaction. Rather than using a phone number, the LEILA system may use an alternative identifier associated with the user, such as an encrypted security code. In other embodiments, the telephone number may be the public-facing identifier, but all transactional information is conducted using encryption to minimize the risk of an information breach. In embodiments, the encrypted identifier is linked to the credit card number as part of the transaction protocol and communicated to the NFC-enabled terminal, so that the identifier is autonomously linked to the transaction without the user needing to separately input the identifier. For non-NFC terminals, the phone number may be entered manually via a key pad, similar to a user inputting a phone number for a merchant's loyalty program. In embodiments, the encrypted identifier is instantiated on a credit card by the issuer, so that use of the credit card autonomously includes the encrypted identifier in the data stream associated with a given transaction. Use of the credit card, such as by manual insertion into a payment terminal, "swiping" or "tapping" the card near a NFC receiver on a payment terminal, etc. autonomously includes user confirmation to proceed with the transaction. Alternatively, the personal identifier is held on a device, such as a mobile phone, fob, smart watch, etc., separate from the credit card and communicated to the NFC-enabled terminal, so that attempted use of a lost or stolen credit card without the personal identifier results in the transaction being denied and/or an alert sent to the accredited user. In embodiments, the user's information may be stored on and communicated to the payment terminal via a device such as a mobile phone, fob, smart watch, etc. by NFC when the device is presented to the payment terminal. In some embodiments, user confirmation of a transaction may require user input on a user interface on the device.

[0048] In embodiments, the device 302 is configured to communicate with payment terminal 303 by wireless near-field communication. Device 302 comprises a device for autonomous

transaction data processing wherein the device is associated with a user, the user-associated device comprising a processor and a communications module; and a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the processor, causes the processor to transmit an account number for a credit account, line of credit or debit account associated with the user when the user desires to purchase a good or service to a second device associated with a merchant; transmit a personal identifier associated with the user to the second device; transmit to the second device instructions to provide data associated with a transaction for purchase of the good or service linked to the personal identifier; and receive data associated with the transaction for purchase of the good or service linked to the personal identifier from the second device; and communicate the data associated with the transaction to an accounting domain server.

[0049] The device 302 may be further configured to translate the data associated with the transaction for purchase of the good or service linked to the personal identifier into XML format for communication to and storage by the accounting domain server. The device 302 may be a mobile phone, fob, smart watch, tablet, or personal computer.

[0050] The device 303 comprises a processor and a communications module; and a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the processor, causes the processor to receive from a merchant data associated with a transaction for purchase of a good or service; receive an account number for a credit account, line of credit or debit account associated with a user desiring to purchase the good or service; receive a personal identifier associated with the user; communicate the data associated with the transaction and the account number to an approver and receive from the approver approval for the transaction authorizing the merchant to complete the transaction; and communicate the data associated with the transaction and the approval to a remote device associated with the personal identifier of the user.

[0051] The communications module of device 303, which may be a payment terminal at a merchant, comprises near field communication functionality to receive the personal identifier from the remote device and communicate the data associated with the transaction and the approval to the remote device. The device 303 may comprise a display configured to visually display data associated with the transaction to the user. The device 303 may comprise a keypad configured to manually enter the personal identifier and communicate it to the processor.

[0052] To enable communication between device 302 and device 303, they use a handshake protocol using the public key infrastructure (PKI), establishing a shared symmetric key between the parties to ensure confidentiality and integrity of the communicated data.

[0053] In some embodiments, more than one personal identifier may be linked to a given credit card number. For example, a joint credit account among a plurality of users may be linked to a plurality of identifiers, each associated with one of the plurality of users, so that each transaction can be attributed to a specific user. In embodiments, the credit account may have a primary identifier and secondary identifiers, wherein the primary identifier may be assigned to a primary account holder who has access to the entire database, while each of the secondary users have access only to the transactions attributed to a specific secondary user.

[0054] In step 304, the amount of the transaction is communicated to a traditional payment processing service provider (PPSP) for payment processing and, simultaneously or subsequently, a detailed transaction breakdown is translated by the ALIA protocol into Extensible Markup Language (XML) and transmitted to the Accounting Domain Server (ADS) (step 305) with attribution based on the telephone number or other unique identifier as a pending transaction.

[0055] Extensible Markup Language (XML) is a markup language and file format for storing, transmitting, and reconstructing arbitrary data. It defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. The World Wide Web Consortium's XML 1.0 Specification of 1998 and several other related specifications, all of them free open standards, define XML. The design goals of XML emphasize simplicity, generality, and usability across the Internet. It is a textual data format with strong support via Unicode for different human languages. Although the design of XML focuses on documents, the language is widely used for the representation of arbitrary data structures such as those used in web services. Several schema systems exist to aid in the definition of XML-based languages, while programmers have developed many application programming interfaces (APIs) to aid the processing of XML data.

[0056] As disclosed herein, the XML language and file format may be used to communicate transaction information among a customer’s credit card or mobile device, a merchant, PPSP, CCA and Issuer Bank to provide a customer with a database or ledger providing immediate recording and accounting of transactions conducted with a credit card, debit account or credit line associated with a unique personal identifier.

[0057] Credit card approval among the PPSP, CCA and the bank is processed in traditional fashion, as shown in steps 2, 3, 4, 5 and 6 in Fig. 1. After the transaction is approved, an authorization number or approval is transmitted to the merchant via the PPSP (step 306). The authorization number is also received by the LEILA app via the payment terminal (step 307) for translating the approved transaction into XML format by the ALIA protocol. The authorization is communicated to the ADS (step 308) to modify the pending transaction to record it as a completed transaction. In embodiments, communication of data related to the transaction from device 302 to the ADS may occur after the authorization number or approval is received by the device 302. That is, steps 305 and 308 may be combined in a single data transfer.

[0058] In embodiments, the device 302 may be configured to include ALIA software to translate the data associated with the transaction into XML for communicating to the ADS. In other embodiments, data associated with the transaction is communicated, preferably encrypted, from the device 302 to the ADS without translation into XML, where the ALIA software translates the data into XML format for recording the transaction in the database of the ADS.

[0059] The Accounting Domain Server (ADS) adds new layers of personal security. It auto-checks payments vs receipts, auto-maintains detailed records and auto-reconciles multiple accounts. For example, the Accounting Domain Server can be partitioned among different sources and uses, and/or different accounts such as personal or business-based accounts. The ADS reports the transaction back to the customer (user) to signal the transaction was executed and reconciled. In embodiments, LEILA stores the transaction data in searchable, associated memory for future retrieval, such as for periodic reconciliation reports, which can be generated autonomously or on request by a user. A user request for a report may be triggered by a user using a search function instantiated in the application.

[0060] The LEILA/ALIA advantage is that it provides genuine real-time accounting. It is keyless, requiring no manual data entry and timeless, with autonomous data entry based on the user's phone number or other identifier. It provides automatic, autonomous recording, reporting and reconciliation for each transaction as it occurs. Ease of use triggers uptake. Autonomous reconciliation of accounts enables users to spend time reviewing their transactions instead of entry of receipts, leading to greater awareness of how their money is spent and potential problems that may arise. In turn, the greater awareness of users' transactions provides greater security, because

potential accounting discrepancies due to errors or tampering can be found and resolved much earlier than currently possible.

[0061] The complexity of conventional data exchange is removed by the XML-based ALIA protocol. Instant record-making and reporting is based on phone number/app. The system provides automated reconciliation based on previously impractical/impossible detail. The digital reliability excludes propensity for human error. Fraud prevention/intervention is possible in real-time, providing financial peace of mind in an age of identity theft and ubiquitous scammers. The system enables money management with ease on an unprecedented level.

[0062] In embodiments, attempts to use a credit card number without the personal identifier may result in an override so that the transaction is denied and/or a notification is sent to the ADS and in turn to the account holder to alert the account holder that a suspicious transaction was identified. For example, use of a credit card without receiving an identifier from a second device, such as a mobile phone fob or smart watch holding the identifier number may be used to identify fraudulent use of a credit card for a transaction.

[0063] Figure 4 depicts a method for processing data associated with a transaction according to an exemplary embodiment of the disclosed subject matter. The method shown comprises the steps carried out by the disclosed system on behalf of a user of the system, but does not include steps or activities conducted on behalf of the merchant, including for example inventory management, or activities conducted during the transaction approval process.

[0064] The method 400 comprises, in block 401, communicating payment information and a unique identifier associated with a user from a first device associated with the user to a second device associated with a merchant (seller) for a transaction for purchase of goods or services. This step generally coincides with step 301 of Fig. 3 and includes activities described for step 301. The first device may be device 302 and the second device may be device 303.

[0065] In block 402, the first device receives data associated with the transaction from the second device. As described above, data associated with the transaction can include a price at which the good or service is offered, which may include a percentage off or a coupon code that defines a discounted price, identification of the good or service for accounting in the seller's inventory control system and for providing to the customer in the form of an electronic receipt. Data associated with the transaction may also comprise the approval or authorization number for the transaction from an approver as described above.

[0066] Block 403 comprises translating data associated with the transaction into XML format. Translating may occur using software instantiated on the first device 302 (See path A), or it may be occur using software instantiated on a device associated with an accounting domain server (ADS) after communicating transaction data to the ADS (See path B, dashed arrows).

[0067] Block 404 comprises communicating the data associated with the transaction to the accounting domain server. In some embodiments, the accounting domain server is instantiated on a device held by the user, such as a personal computer or tablet. In other embodiments, the accounting domain server is instantiated at an accounting services provider. In any embodiments, the communication of the data may be done wirelessly.

[0068] Block 405 comprises attributing the transaction to a category based on data associated with the transaction and the unique identifier.

[0069] Auto attribution includes the system autonomously requesting and receiving digital information (data) regarding the transaction from the merchant's payment terminal such as transaction amount, a description of the good or service to be purchased, SKU number, etc. Generally, the information received is the same information that would be printed on a paper receipt or provided for generation of a digital receipt such as delivered via email. The data may be obtained from the payment terminal in XML format, or converted to XML format if necessary by the application for communication to an Accounting Domain Server (ADS) 310 in the system.

[0070] Attribution may also include linking the transaction to an account holding funds for paying the extended credit at a subsequent time, which may include linking the transactions to an auto-payment protocol for paying the credit card issuer. If the transaction is attributed as a debit transaction, data linking the transaction to a user's debit account may be attributed, so that the transaction can be completed by electronic transfer of funds from the user's debit account to the merchant's bank (see step 11 in Fig. 1).

[0071] In embodiments, attribution may be set up for classes of transactions in the ADS prior to execution of the transactions. For example but not limitation, transactions related to purchases of gasoline may be attributed to a credit account linked to the gasoline retailer, with the attribution linked to the specific individual whose personal device and/or personal identifier was used to purchase the gasoline. Attribution of the purchase may also include classification attributed to the specific individual as business or personal.

[0072] In embodiments, attribution of a transaction may be partial, limited to information exchanged during the transaction itself, with further attribution added subsequently by a user reviewing a report of transactions. For example but not limitation, transactions involving multiple credit accounts incurred during a business trip may be grouped together for reporting purposes.

[0073] Block 406 comprises recording the attributed transaction in a database in the accounting domain server.

[0074] In block 407, the method may further comprise providing data associated with the attributed transaction to the user. The data may be provided to the user displaying the data associated with the attributed transaction to the user visually on an interactive display.

[0075] In block 408 the method may further receiving instructions from the user. For example, the display may include a search panel and instructions include the user searching for a transaction for review. Optionally, the instructions may include the user modifying the data associated with a transaction. For example, the user may revise the attribution of the transaction and/or adding additional information to the transaction record in the accounting database. Instructions may also include the user instructing the ADS to make a payment to the credit account associated with the transaction to cover the transaction.

[0076] The transactions may be displayed to a user in a user-friendly format on a display embodied on a device such as a laptop computer, tablet or mobile phone, as illustrated in Figure 5. The display shown is a summary display page listing transactions by date. Each transaction summary includes the amount of the transaction, the payee or payor, category of transaction and account associated with the transaction, if more than one account is tracked by the system. Payments out of the system are designated by a minus (-) sign and payments into the system are designated with a different color, a plus (+) sign or another indicator. A photo associated with the transaction can be uploaded to the system from, for example, the phone's camera. A search panel allows the user to search for transactions. The large plus (+) button at lower right is a trigger to initiate a new transaction. It may be linked to payment triggers such that activation of the button triggers payment. Alternatively or additively, the LEILA system can be linked to tap-to-pay applications for credit card accounts instantiated on the phone, or instantiated on a smart watch or fob in wireless communication with the device.

[0077] Clicking or tapping on an individual transaction allows a user to see further details for that transaction that may include reconciliation status, etc. Other displays may include reports based on payment category, payees, etc.

[0078] For the system to be generally useful, the user would need to communicate via device 302 to a plurality of devices 303 associated with a plurality of merchants to purchase a plurality of goods and services. Accordingly, the system may comprise a distributed network comprising a plurality of devices 303 associated with a plurality of merchants and a server or servers in communication with the plurality of devices, wherein the server comprises a central processor and a central communications module; and a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the processor, causes the central processor to receive data associated with a plurality of transactions from the plurality of devices, wherein data associated with each transaction includes a purchase price, an account number of a user and a personal identifier of the user and one of the plurality of devices where each transaction was entered; communicate the data associated with the plurality of transactions to an approver; receive from the approver a plurality of approvals for the plurality of transactions, wherein each approval of the plurality of transactions is associated with the one of the plurality of devices where the transaction was entered; transmit each approval to the one of the plurality of devices where the transaction was entered, wherein approval for each transaction authorizes the merchant to complete the transaction; and instruct the device associated with the transaction to communicate the data associated with the transaction and the approval to a remote device associated with the personal identifier of the user.

[0079] FIG. 6 is a schematic diagram illustrating example embodiments of a distributed network comprising nodes and users that may be involved in a smart system for transaction data processing. A node is a connection point in a communications network and allow users to interact with the network. Each node is an endpoint for data transmissions or redistribution. Nodes have either a programmed or engineered capability to recognize, process and forward transmissions to other network nodes. As illustrated in FIG. 6, in some embodiments, a smart transaction data processing platform 600 can comprise a plurality of merchant or seller nodes 602, each comprising a payment terminal 303 configured to communicate with a plurality of nodes 601 associated with a plurality of users via their user-associated devices 302. The merchant nodes are configured to receive payment information, such as a credit card account number and a unique identifier such as

a telephone number from each of the plurality of users and communicate transaction information to the user-associated devices 302 and one or more nodes 603 associated with payment processing service providers. In instances of on-premise transactions, communication between the user-associated device 302 and device 303may be accomplished by wireless near field communications. For internet sales, the merchant node may be a seller webpage and the device 303 may be a server comprising processor(s) configured to send and receive data over the internet. The merchant nodes 602 transmit data regarding the transaction, including price and user credit information, to the nodes 603. Nodes 603 in turn communicate with credit card association nodes 605 and credit card issuer nodes 606 to obtain approval for each of the transactions desired by the plurality of users from the credit card association nodes 605 and credit card issuer nodes 606, all of which can be in communication with one another through a network 610. Approval of each of the transactions is communicated to each of the merchant nodes 602 where the transaction originated. Approval of each transaction is communicated to the user-associated device 302 connected to the merchant node 602 linked to each transaction, along with data summarizing the goods or services purchased, the purchase price and optionally merchant SKU codes for each transaction. The data associated with the transaction, including the approval, are communicated to a plurality of user-associated nodes 604 for attribution and recordation in databases in user-associated ADSs 310. In embodiments, the user-associated ADSs may be instantiated in local systems possessed by a user, such as a mobile phone, tablet or personal computer, or may be instantiated in servers remote from the users, such as in a cloud-based service provider 615 for maintaining ADS databases for a plurality of users.

[0080] As shown in FIG. 7, a computer system 700 is the core element within the LEILA/ALIA system, receiving, generating, storing, integrating and coordinating data required for conducting transactions between a user 710 and one or more of a plurality of merchants (sellers) 720 and recording the transactions in a user-accessible database. The high-level architecture of the computer system 700 includes at least one processor 701 and memory 702 into which are loaded software components and instructions for receiving informational inputs from the user and the plurality of merchants and outputting information via communications module 703.

[0081] In addition to storing instruction for the processor to execute the methods describe herein, memory 702 may store information associated with the user including one or more accounts

for obtaining credit for completing a transaction and the user's personal identifier. Memory 702 may also store information related to attribution of transactions managed by the system.

[0082] Block 703 represents a communications module, which manages communications (inputs/outputs) among users and merchants. User inputs include designation of a payment vehicle or digital "wallet", such as a bank account, credit or debit account, including credit or debit cards issued by a financial institution, Venmo or Pay Pal® apps, etc., a personal identifier as described above, and in some embodiments, user confirmation to execute a transaction. User inputs may also include interactions with the ADS to attribute, review, reconcile or transactions. User inputs can be communicated to the communications module 703 via one or more user interfaces 711. Communications module 703 outputs user information to a merchant 720 for a transaction and receives additional information from the merchant 702. Communication between the system 700 and a merchant regarding a transaction may be primarily conducted by communications module 703 in operational connectivity to a device 302, which in turn is in operational connectivity with a device 303 associated with a merchant 720. Normally, merchant information related to the transaction is inputted into the device 303 as part of the transaction process, so that a merchant 720 need not communicate actively with the computer system 700. Notably, the device 302 can communicate with a plurality of devices 303 associated with a plurality of merchants as described above.

[0083] Communications module 703 may also be used by administrator(s) 715 of the computer system 700 to communicate with the system via, for example, a user interface 711, which is not necessarily the same as the user interface for the user 710. Administrator(s) 715 may include representatives of a service provider 615 for maintaining ADS databases for a plurality of users. Administrator(s) 715 may provide inputs to the system to maintain and manage the system to make sure it is operating correctly.

[0084] The computer system 700 also comprises a translation module 704, which translates data related to a transaction in to XML format suitable for recording and storing transaction information for retrieval. As described above XML is a computer language suitable for storing data in a user-friendly format for retrieval and review.

[0085] Block 705 comprises the ADS module that attributes the transaction according to predetermined attribution definitions set by the user and stored in the memory 702, and stores it in a local electronic ledger or database in data store 708, instantiated locally in a computer device

owned by the user, or in a remote electronic ledger or database in data store 708, instantiated remotely, such as in a remote service provider 615.

[0086] Bus 706 connects the modules together as described further below, so that all modules are operatively connected, allowing for instructions and data transfer among them.

[0087] FIG. 7 depicts primarily the functional architecture of a computer system for implementing the LEILA/ALIA system described herein. FIG. 8 depicts a computer system 800 according to an embodiment of the present disclosure, with emphasis on aspects of hardware associated with the system. In general, the computer system 800 may include a computing device 810, such as a special-purpose or general-purpose computer designed and implemented for receiving user inputs, determining and directing and controlling the output of signals. The computing device 810 may comprise or include data sources, client devices, and so forth. In certain aspects, the computing device 810 may be implemented using hardware or a combination of software and hardware. The computing device 810 may be a standalone device, a device integrated into another entity or device, a platform distributed across multiple entities, or a virtualized device executing in a virtualization environment.

[0088] The computing device 810 may communicate across a network 802. The network 802 may include any data network(s) or internetwork(s) suitable for communicating data and control information among participants in the computer system 800. This may include public networks such as the Internet, private networks, and telecommunications networks such as the Public Switched Telephone Network or cellular networks using cellular technology and/or other technologies, as well as any of a variety other local area networks or enterprise networks, along with any switches, routers, hubs, gateways, and the like that might be used to carry data among participants in the computer system 800. The network 802 may also include a combination of data networks and need not be limited to a strictly public or private network.

[0089] The computing device 810 may communicate with an external device 804. The external device 804 may be any computer, mobile device such as a cell phone, tablet, smart watch or other remote resource that connects to the computing device 810 through the network 802. This may include any of the servers or data sources described herein, including servers, content providers, databases or other sources for information to be used by the devices as described herein. A specific external device may be device 302 described above.

[0090] In general, the computing device 810 may include a controller or processor 812, a memory 814, a network interface 816, a data store 818, and one or more input/output interfaces 820. The computing device 810 may further include or be in communication with peripherals 822 and other external input/output devices that might connect to the input/output interfaces 820.

[0091] The controller 812 may be implemented in software, hardware or a combination of software and hardware. According to one aspect, the controller 812 may be implemented in application software running on a computer platform. Alternatively, the controller 812 may include a processor or other processing circuitry capable of processing instructions for execution within the computing device 810 or computer system 800. The controller 812, as hardware, may include a single-threaded processor, a multi-threaded processor, a multi-core processor and so forth. The controller 812 may be capable of processing instructions stored in the memory 814 or the data store 818.

[0092] The memory 814 may store information within the computing device 810. One can appreciate that memory 814 may be an instantiation of memory 702 of Figure 7. The memory 814 may include any volatile or non-volatile memory or other computer-readable medium, including without limitation a Random-Access Memory (RAM), a flash memory, a Read Only Memory (ROM), a Programmable Read-only Memory (PROM), an Erasable PROM (EPROM), registers, and so forth. The memory 814 may store program instructions, program data, executables, and other software and data useful for controlling operation of the computing device 810 and configuring the computing device 810 to perform functions for a user 710. The memory 814 may include a number of different stages and types of memory for different aspects of operation of the computing device 810. For example, a processor may include on-board memory and/or cache for faster access to certain data or instructions, and a separate, main memory or the like may be included to expand memory capacity as desired. All such memory types may be a part of the memory 814 as contemplated herein.

[0093] The memory 814 may, in general, include a non-volatile computer readable medium containing computer code that, when executed by the computing device 810 creates an execution environment for a computer program in question, e.g., code that constitutes processor firmware, a protocol stack, a database management system, an operating system, or a combination of the foregoing, and that performs some or all of the steps set forth in the various flow charts and other

algorithmic descriptions set forth herein. While a single memory 814 is depicted, it will be understood that any number of memories may be usefully incorporated into the computing device 810.

[0094] The network interface 816 may include any hardware and/or software for connecting the computing device 810 in a communicating relationship with other resources through the network 802. This may include remote resources accessible through the Internet, as well as local resources available using short range communications protocols using, e.g., physical connections (e.g., Ethernet), radio frequency communications (e.g., Wi-Fi, Bluetooth, NFC), optical communications (e.g., fiber optics, infrared, or the like), ultrasonic communications, or any combination of these or other media that might be used to carry data between the computing device 810 and other devices. The network interface 816 may, for example, include a router, a modem, a network card, an infrared transceiver, a radio frequency (RF) transceiver for receiving AM/FM or satellite radio sources, a near field communications interface, a radio-frequency identification (RFID) tag reader, or any other data reading or writing resource or the like.

[0095] The network interface 816 may include any combination of hardware and software suitable for coupling the components of the computing device 810 to other computing or communications resources. By way of example and not limitation, this may include electronics for a wired or wireless Ethernet connection operating according to the IEEE 802.11 standard (or any variation thereof), or any other short or long range wireless networking components or the like. This may include hardware for short range data communications such as Bluetooth or an infrared transceiver 880 and antenna 881, which may be used to couple to other local devices, or to connect to a local area network or the like that is in turn coupled to a data network 802 such as the Internet. This may also include hardware/software for a WiMax connection or a cellular network connection (using, e.g., CDMA, GSM, LTE, or any other suitable protocol or combination of protocols). The network interface 816 may be included as part of the input/output devices 820 or vice-versa. One can appreciate that the network interface 816 may be part of or controlled by the communications module 703.

[0096] The data store 818 may be any internal or external memory store providing a computer-readable medium such as a disk drive, an optical drive, a magnetic drive, a flash drive, or other device capable of providing mass storage for the computing device 810. The data store 818 may

store computer readable instructions, data structures, program modules, and other data for the computing device 810 or computer system 800 in a non-volatile form for relatively long-term, persistent storage and subsequent retrieval and use. For example, the data store 818 may store an operating system, application programs, program data, databases, files, and other program modules or other software objects and the like. Specific embodiments of data stores may comprise data stores 708 or 709 described above.

[0097] As used herein, processor, microprocessor, and/or digital processor may include any type of digital processing device such as, without limitation, digital signal processors ("DSPs"), reduced instruction set computers ("RISC"), complex instruction set computers ("CISC") processors, microprocessors, gate arrays (e.g., field programmable gate arrays ("FPGAs")), programmable logic device ("PLDs"), reconfigurable computer fabrics ("RCFs"), array processors, secure microprocessors, and application-specific integrated circuits ("ASICs"). Such digital processors may be contained on a single unitary integrated circuit die or distributed across multiple components.

[0098] As used herein, computer program and/or software may include any sequence or human or machine cognizable steps which perform a function. Such computer program and/or software may be rendered in any programming language or environment including, for example, C/C++, C#, Fortran, COBOL, MATLAB™, PASCAL, GO, RUST, SCALA, Python, assembly language, markup languages (e.g., HTML, SGML, XML, VoXML), and the like, as well as object-oriented environments such as the Common Object Request Broker Architecture ("CORBA"), JAVA™ (including J2ME, Java Beans, etc.), Binary Runtime Environment (e.g., "BREW"), and the like.

[0099] The input/output interface 820 may support input from and output to other devices that might couple to the computing device 810. This may, for example, include serial ports (e.g., RS-232 ports), universal serial bus (USB) ports, optical ports, Ethernet ports, telephone ports, audio jacks, component audio/video inputs, HDMI ports, and so forth, any of which might be used to form wired connections to other local devices. This may also include an infrared interface, RF interface, magnetic card reader, or other input/output system for wirelessly coupling in a communicating relationship with other local devices. It will be understood that, while the network interface 816 for network communications is described separately from the input/output interface 320 for local device communications, these two interfaces may be the same, or may share functionality, such as where a USB port 870 is used to attach to a Wi-Fi accessory, or where an

Ethernet connection is used to couple to a local network attached storage. The input/output interface 820 may further output signals to displays of peripheral devices, as described herein.

[00100] As used herein, a user is any human that interacts with the computer system 800. In this context, user 710 is a user of the computer system 800 to conduct and manage transactions using the computer system. Other users may include administrators 715.

[00101] In certain embodiments the I/O interface 820 facilitates communication with input and output devices for interacting with a user 710. For example, the I/O interface may communicate with one or more devices such as a user-input device and/or a display 850, which may be instantiated on the device 810 described herein and/or on a separate device such as a mobile device 808, which enable a user to interact directly with the controller 812 via bus 332. The user-input device may comprise one or more push-buttons, switches, dials, sliders, etc., mouse, touch screen, or other that allows a user to input information, including mechanical, electronic inputs, or combinations thereof. In these embodiments, the I/O interface 820 may further comprise a display to provide visual output to the user. The display may comprise any of a variety of visual displays, such as a viewable screen, a set of viewable symbols or numbers, and so on. One can appreciate that the inputs and outputs of the computer system may be different for a user 710 and administrator(s) 715. Accordingly, the computing device 810 may communicate with users 710 and administrators 715 with different interfaces 824 and 828.

[00102] A peripheral 822 may include any device used to provide information to or receive information from the computing device 810. This may include human input/output (I/O) devices such as a keyboard, a mouse, a mouse pad, a track ball, a joystick, a microphone, a foot pedal, a camera, a touch screen, a scanner, or other device that might be employed by the user 710 to provide input to the computing device 810. This may also or instead include a display, a printer, a projector, a headset or any other audiovisual device for presenting information to a user. The peripheral 822 may also or instead include a digital signal processing device, an actuator, or other device to support control of or communication with other devices or components. In one aspect, the peripheral 822 may serve as the network interface 316, such as with a USB device configured to provide communications via short range (e.g., Bluetooth, Wi-Fi, NFC, Infrared, RF, or the like) or long range (e.g., cellular data or WiMax) communications protocols. In another aspect, the peripheral 822 may augment operation of the computing device 810 with additional functions or features, or other device. In another aspect, the peripheral 822 may include a storage device such

as a flash card, USB drive, or other solid-state device, or an optical drive, a magnetic drive, a disk drive, or other device or combination of devices suitable for bulk storage. More generally, any device or combination of devices suitable for use with the computing device 810 may be used as a peripheral 822 as contemplated herein.

[00103] Other hardware 826 may be incorporated into the computing device 810 such as a co-processor, a digital signal processing system, a math co-processor, a graphics engine, a video driver, a camera, a microphone, additional speakers, and so forth. The other hardware 826 may also or instead include expanded input/output ports, extra memory, additional drives, and so forth.

[00104] A bus 832 or combination of busses may serve as an electromechanical backbone for interconnecting components of the computing device 810 such as the controller 812, memory 814, network interface 816, other hardware 826, data store 818, and input/output interface. As shown in the figure, each of the components of the computing device 810 may be interconnected using a system bus 832 in a communicating relationship for sharing controls, commands, data, power, and so forth.

[00105] The computing device 810 is connected to a power source 860 to provide electrical power for the computing device to run.

[00106] The various illustrative logical blocks, modules and circuits described in connection with the present disclosure may be implemented or performed with a processor or processors 701 specially configured to perform the functions discussed in the present disclosure. The processor may be a neural network processor, a digital signal processor (DSP), an application specific integrated circuit (ASIC), a field programmable gate array signal (FPGA) or other programmable logic device (PLD), discrete gate or transistor logic, discrete hardware components or any combination thereof designed to perform the functions described herein. Alternatively, the processing system may comprise one or more neuromorphic processors for implementing the neuron models and models of neural systems described herein. The processor may be a microprocessor, controller, microcontroller, or state machine specially configured as described herein. A processor may also be implemented as a combination of computing devices, e.g., a combination of a DSP and a microprocessor, a plurality of microprocessors, one or more microprocessors in conjunction with a DSP core, or such other special configuration, as described herein.

[00107] The steps of a method or algorithm described in connection with the present disclosure may be embodied directly in hardware, in a software module executed by a processor, or in a combination of the two. A software module may reside in storage or machine readable medium, including random access memory (RAM), read only memory (ROM), flash memory, erasable programmable read-only memory (EPROM), electrically erasable programmable read-only memory (EEPROM), registers, a hard disk, a removable disk, a CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium that can be used to carry or store desired program code in the form of instructions or data structures and that can be accessed by a computer. A software module may comprise a single instruction, or many instructions, and may be distributed over several different code segments, among different programs, and across multiple storage media. A storage medium may be coupled to a processor such that the processor can read information from, and write information to, the storage medium. In the alternative, the storage medium may be integral to the processor.

[00108] The methods disclosed herein comprise one or more steps or actions for achieving the described method. The method steps and/or actions may be interchanged with one another without departing from the scope of the claims. In other words, unless a specific order of steps or actions is specified, the order and/or use of specific steps and/or actions may be modified without departing from the scope of the claims.

[00109] The functions described may be implemented in hardware, software, firmware, or any combination thereof. If implemented in hardware, an example hardware configuration may comprise a processing system in a device. The processing system may be implemented with a bus architecture. The bus may include any number of interconnecting buses and bridges depending on the specific application of the processing system and the overall design constraints. The bus may link together various circuits including a processor, machine-readable media, and a bus interface. The bus interface may be used to connect a network adapter, among other things, to the processing system via the bus. The network adapter may be used to implement signal processing functions. For certain aspects, a user interface (e.g., keypad, display, mouse, joystick, etc.) may also be connected to the bus. The bus may also link various other circuits such as timing sources, peripherals, voltage regulators, power management circuits, and the like, which are well known in the art, and therefore, will not be

described any further.

[00110] The processor may be responsible for managing the bus and processing, including the execution of software stored on the machine-readable media. Software shall be construed to mean instructions, data, or any combination thereof, whether referred to as software, firmware, middleware, microcode, hardware description language, or otherwise.

[00111] In a hardware implementation, the machine-readable media may be part of the processing system separate from the processor. However, as those skilled in the art will readily appreciate, the machine-readable media, or any portion thereof, may be external to the processing system. By way of example, the machine-readable media may include a transmission line, a carrier wave modulated by data, and/or a computer product separate from the device, all which may be accessed by the processor through the bus interface. Alternatively, or in addition, the machine-readable media, or any portion thereof, may be integrated into the processor, such as the case may be with cache and/or specialized register files. Although the various components discussed may be described as having a specific location, such as a local component, they may also be configured in various ways, such as certain components being configured as part of a distributed computing system.

[00112] The machine-readable media may comprise a number of software modules. The software modules may include a transmission module and a receiving module. Each software module may reside in a single storage device or be distributed across multiple storage devices. By way of example, a software module may be loaded into RAM from a hard drive when a triggering event occurs. During execution of the software module, the processor may load some of the instructions into cache to increase access speed. One or more cache lines may then be loaded into a special purpose register file for execution by the processor. When referring to the functionality of a software module, it will be understood that such functionality is implemented by the processor when executing instructions from that software module. Furthermore, it should be appreciated that aspects of the present disclosure result in improvements to the functioning of the processor, computer, machine, or other system implementing such aspects.

[00113] If implemented in software, the functions may be stored or transmitted over as one or more instructions or code on a computer-readable medium. Computer-readable

media include both computer storage media and communication media including any storage medium that facilitates transfer of a computer program from one place to another.

[00114] Further, it should be appreciated that modules and/or other appropriate means for performing the methods and techniques described herein can be downloaded and/or otherwise obtained by a user terminal and/or base station as applicable. For example, such a device can be coupled to a server to facilitate the transfer of means for performing the methods described herein. Alternatively, various methods described herein can be provided via storage means, such that a user terminal and/or base station can obtain the various methods upon coupling or providing the storage means to the device. Moreover, any other suitable technique for providing the methods and techniques described herein to a device can be utilized.

[00115] The computer program controls input and operation of the device. The computer program includes at least one code segment stored in or on a computer-readable medium residing on or accessible by the device for instructing the computing elements, and any other related components to operate in the manner described herein. The computer program is preferably stored within the memory and comprises an ordered listing of executable instructions for implementing logical functions in the device. However, the computer program may comprise programs and methods for implementing functions in the device that are not an ordered listing, such as hard-wired electronic components, programmable logic such as field-programmable gate arrays (FPGAs), application specific integrated circuits, or other similar or conventional methods for controlling the operation of electrical or other computing devices.

[00116] Similarly, the computer program may be embodied in any computer-readable medium for use by or in connection with an instruction execution system, apparatus, or device, such as a computer-based system, processor-containing system, or other system that can fetch the instructions from the instruction execution system, apparatus, or device, and execute the instructions. The computer-readable medium may even be paper or another suitable medium upon which the program is printed, as the program can be electronically captured, via for instance, optical scanning of the paper or other medium, then compiled, interpreted, or otherwise processed in a suitable manner, if necessary, and then stored in a computer memory.

Embodiments

[00117] A system for transaction data processing, comprising a controller; and a non-transitory computer readable storage medium comprising a plurality of computer readable

instructions embodied thereon which, when executed by the controller, causes the controller to communicate payment information and a unique identifier associated with a user to a merchant for a transaction for auto attribution; translate detailed transaction information into XML; and communicate the detailed transaction information to an accounting domain server with attribution based on the unique identifier.

[00118] The system wherein the computer readable instructions further cause the controller to direct the accounting domain server to check payments versus receipts; maintain detailed records of transactions reconcile accounts; or generate reports to a user.

[00119] The system further comprising a device configured to communicate with a payment terminal to conduct transactions via near-field communications; a user interface to communication information between the controller and the user; and a display to display information to the user.

[00120] A non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon wherein the instructions, when executed by a controller of a device, causes the controller to communicate payment information and a unique identifier associated with a user to a merchant for a transaction for auto attribution; translate detailed transaction information into XML; and communicate the detailed transaction information to an accounting domain server with attribution based on the unique identifier.

[00121] The non-transitory computer readable storage medium wherein the computer readable instructions cause the controller to direct the accounting domain server to check payments versus receipts; maintain detailed records of transactions reconcile accounts; or generate reports to a user.

[00122] A method for transaction data processing executed by a controller on a device comprising the controller, the method comprising the controller communicating payment information and a unique identifier associated with a user to a merchant for a transaction for auto attribution; translating detailed transaction information into XML; and communicating the detailed transaction information to an accounting domain server with attribution based on the unique identifier.

[00123] The method further comprises the controller directing the accounting domain server to check payments versus receipts; maintain detailed records of transactions reconcile accounts; or generate reports to a user.

[00124] Based on the teachings, one skilled in the art should appreciate that the scope of the

present disclosure is intended to cover any aspect of the present disclosure, whether implemented independently of or combined with any other aspect of the present disclosure. For example, an apparatus may be implemented or a method may be practiced using any number of the aspects set forth. In addition, the scope of the present disclosure is intended to cover such an apparatus or method practiced using other structure, functionality, or structure and functionality in addition to, or other than the various aspects of the present disclosure set forth. It should be understood that any aspect of the present disclosure may be embodied by one or more elements of a claim.

[00125] Although particular aspects are described herein, many variations and permutations of these aspects fall within the scope of the present disclosure. Although some benefits and advantages of the preferred aspects are mentioned, the scope of the present disclosure is not intended to be limited to particular benefits, uses or objectives. Rather, aspects of the present disclosure are intended to be broadly applicable to different technologies, system configurations, networks and protocols, some of which are illustrated by way of example in the figures and in the following description of the preferred aspects. The detailed description and drawings are merely illustrative of the present disclosure rather than limiting, the scope of the present disclosure being defined by the appended claims and equivalents thereof.

[00126] It is to be understood that the claims are not limited to the precise configuration and components illustrated above. Various modifications, changes, and variations may be made in the arrangement, operation, and details of the methods and apparatus described above without departing from the scope of the claims.

CLAIMS

1. A system for transaction data processing, comprising

one or more processors; and

a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the one or more processors, causes the one or more processors to communicate payment information and a unique identifier associated with a user to a merchant for a transaction for auto attribution; translate detailed transaction information into XML; and communicate the detailed transaction information to an accounting domain server with attribution based on the unique identifier.

2. The system of claim 1 wherein the computer readable instructions further cause the one or more processors to direct the accounting domain server to check payments versus receipts; maintain detailed records of transactions reconcile accounts; or generate reports to a user.

3. The system of claims 1 or 2 comprising a device configured to communicate with a payment terminal to conduct transactions via near-field communications; a user interface to communication information between the controller and the user; and a display to display information to the user.

4. The system of any of claims 1, 2 or 3 comprising a device for autonomous transaction data processing wherein the device is associated with a user, the user-associated device comprising

a processor and a communications module; and a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the processor, causes the processor to

transmit an account number for a credit account, line of credit or debit account associated with the user when the user desires to purchase a good or service to a device associated with a merchant;

transmit a personal identifier associated with the user to the device associated with the merchant;

transmit to the device associated with the merchant instructions to provide data associated with a transaction for purchase of the good or service linked to the personal identifier; and

receive data associated with the transaction for purchase of the good or service linked to the personal identifier from the device associated with the merchant; and communicate the data associated with the transaction to an accounting domain server.

5. The system of claim 4 wherein the device associated with the user is further configured to translate the data associated with the transaction for purchase of the good or service linked to the personal identifier into XML format for communication to and storage by the accounting domain server.

6. The system of claim 4 wherein the device associated with the user comprises a mobile phone, fob, smart watch, tablet, or personal computer.

7. The system of claim 1 comprising a first device for autonomous transaction data processing, the first device comprising

a processor and a communications module; and a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the processor, causes the processor to

receive from a merchant data associated with a transaction for purchase of a good or service;

receive an account number for a credit account, line of credit or debit account associated with a user desiring to purchase the good or service;

receive a personal identifier associated with the user;

communicate the data associated with the transaction and the account number to an approver and receive from the approver approval for the transaction authorizing the merchant to complete the transaction; and

communicate the data associated with the transaction and the approval to a second device associated with the personal identifier of the user.

8. The system of claim 7 wherein the communications module of the first device comprises near field communication functionality to receive the personal identifier from the second device and communicate the data associated with the transaction and the approval to the second device.

9. The system of claims 7 or 8 wherein the first device comprises a display configured to display visually data associated with the transaction to the user.

10. The system of claims 7, 8 or 9 wherein the first device comprises a keypad configured to manually enter the personal identifier and communicate it to the processor.

11. The system of claims 7, 8, 9 or 10 comprising a distributed network comprising a plurality of first devices associated with a plurality of merchants and a server in communication with the plurality of first devices, wherein the server comprises a central processor and a central communications module; and a non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon which, when executed by the processor, causes the central processor to

receive data associated with a plurality of transactions from the plurality of first devices, wherein data associated with each transaction include a purchase price, an account number of a user and a personal identifier of the user and one of the plurality of first devices where each transaction was entered;

communicate the data associated with the plurality of transactions to an approver;

receive from the approver a plurality of approvals for the plurality of transactions, wherein each approval of the plurality of transactions is associated with the one of the plurality of first devices where the transaction was entered;

transmit each approval to the one of the plurality of first devices where the transaction was entered, wherein approval for each transaction authorizes the merchant where the transaction was entered to complete the transaction; and

instruct the first device associated with the transaction to communicate the data associated with the transaction and the approval to a remote device associated with the personal identifier of the user.

12. A non-transitory computer readable storage medium comprising a plurality of computer readable instructions embodied thereon wherein the instructions, when executed by a controller of a device comprising a processor and a communications module, causes the controller to communicate payment information and a unique identifier associated with a user to a merchant for a transaction for auto attribution; translate detailed transaction information into XML; and communicate the detailed transaction information to an accounting domain server with attribution based on the unique identifier.

13. The non-transitory computer readable storage medium of claim 12 wherein the computer readable instructions cause the controller to direct the accounting domain server to check

payments versus receipts; maintain detailed records of transactions reconcile accounts; or generate reports to a user.

14. The non-transitory computer readable storage medium of claims 12 or 13 wherein the device is associated with a user, and the instructions further cause the processor to

transmit an account number for a credit account, line of credit or debit account associated with the user when the user desires to purchase a good or service to a device associated with a merchant;

transmit a personal identifier associated with the user to the device associated with the merchant;

transmit to the device associated with the merchant instructions to provide data associated with a transaction for purchase of the good or service linked to the personal identifier; and

receive data associated with the transaction for purchase of the good or service linked to the personal identifier from the device associated with the merchant; and communicate the data associated with the transaction to an accounting domain server.

15. The non-transitory computer readable storage medium of claim 14 wherein the device associated with the user is further configured to translate the data associated with the transaction for purchase of the good or service linked to the personal identifier into XML format for communication to and storage by the accounting domain server.

16. A method for transaction data processing executed by a by one or more processors in a computerized system, the method comprising the one or more processors communicating payment information and a unique identifier associated with a user to a merchant for a transaction for auto attribution; translating detailed transaction information into XML; and communicating the detailed transaction information to an accounting domain server with attribution based on the unique identifier.

17. The method of claim 16 further comprises the one or more processors directing the accounting domain server to check payments versus receipts; maintain detailed records of transactions reconcile accounts; or generate reports to a user.

18. The method of claims 16 or 17 comprising

communicating payment information and a unique identifier associated with a user from a first device associated with the user to a second device associated with a merchant for a transaction;

receiving by the first device data associated with the transaction from the second device;

translating data associated with the transaction into XML format;

communicating the data associated with the transaction to an accounting domain server;

attributing the transaction to a category based on data associated with the transaction and the unique identifier; and

recording the attributed transaction in a database in the accounting domain server.

19. The method of claim 18 further comprising providing data associated with the attributed transaction to the user.

20. The method of claim 19 comprising

displaying the data associated with the attributed transaction to the user visually on an interactive display; and

optionally receiving instructions from the user to modify data associated with the attributed transaction.

ABSTRACT

A system, method and computer program for inputting and processing data for real-time autonomous accounting comprising communicating payment information and a unique identifier associated with a user to a merchant for a transaction for auto attribution; translating detailed transaction information into XML; and communicating the detailed transaction information to an accounting domain server with attribution based on the unique identifier.