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(54) **MOBILE COMMERCE INFRASTRUCTURE SYSTEMS AND METHODS**

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G06Q 30/00	(2006.01)

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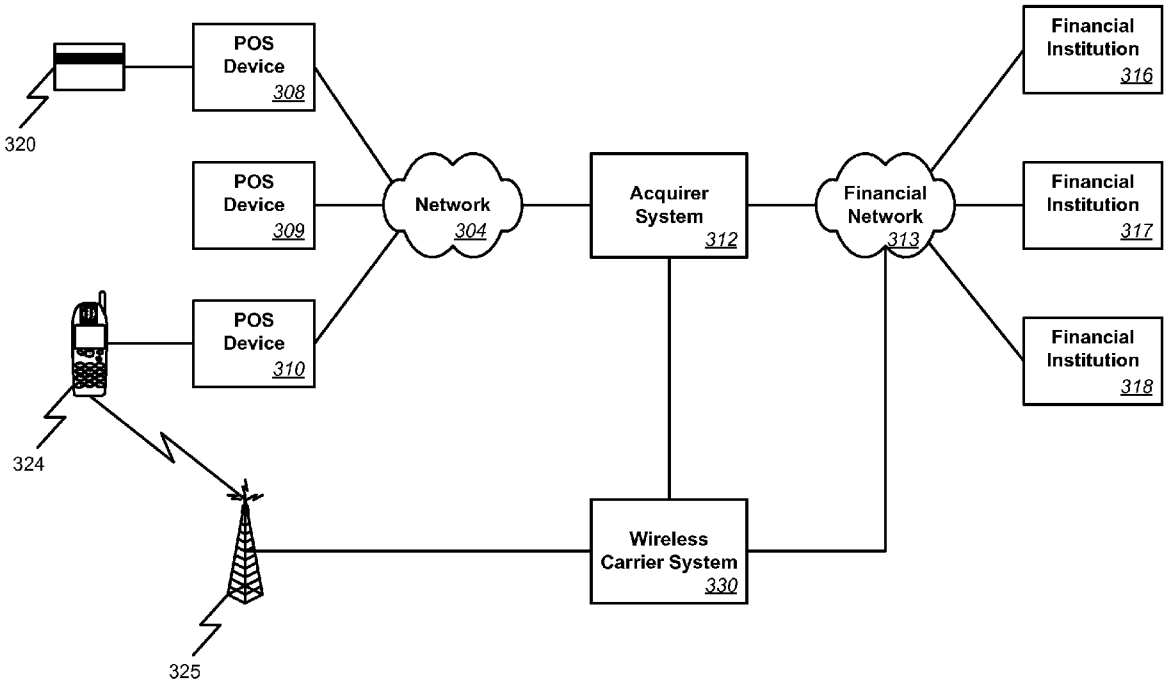
(57) **ABSTRACT**

Methods, systems, and machine readable media are disclosed for Methods, systems, and machine-readable media are disclosed for utilizing mobile electronic devices in various types of financial transactions. According to one embodiment, a system for supporting mobile commerce applications can comprise a management and control layer. The management and control layer can be adapted to control communications to and from mobile wallet applications. The system can also have a gateway services layer communicatively coupled with the management and control layer and a plurality of content provider systems communicatively coupled with the gateway services layer. The content provider systems can be adapted to provide financial transaction content or services related to the mobile commerce functions of the mobile wallet applications via the management and control layer and gateway services layer.



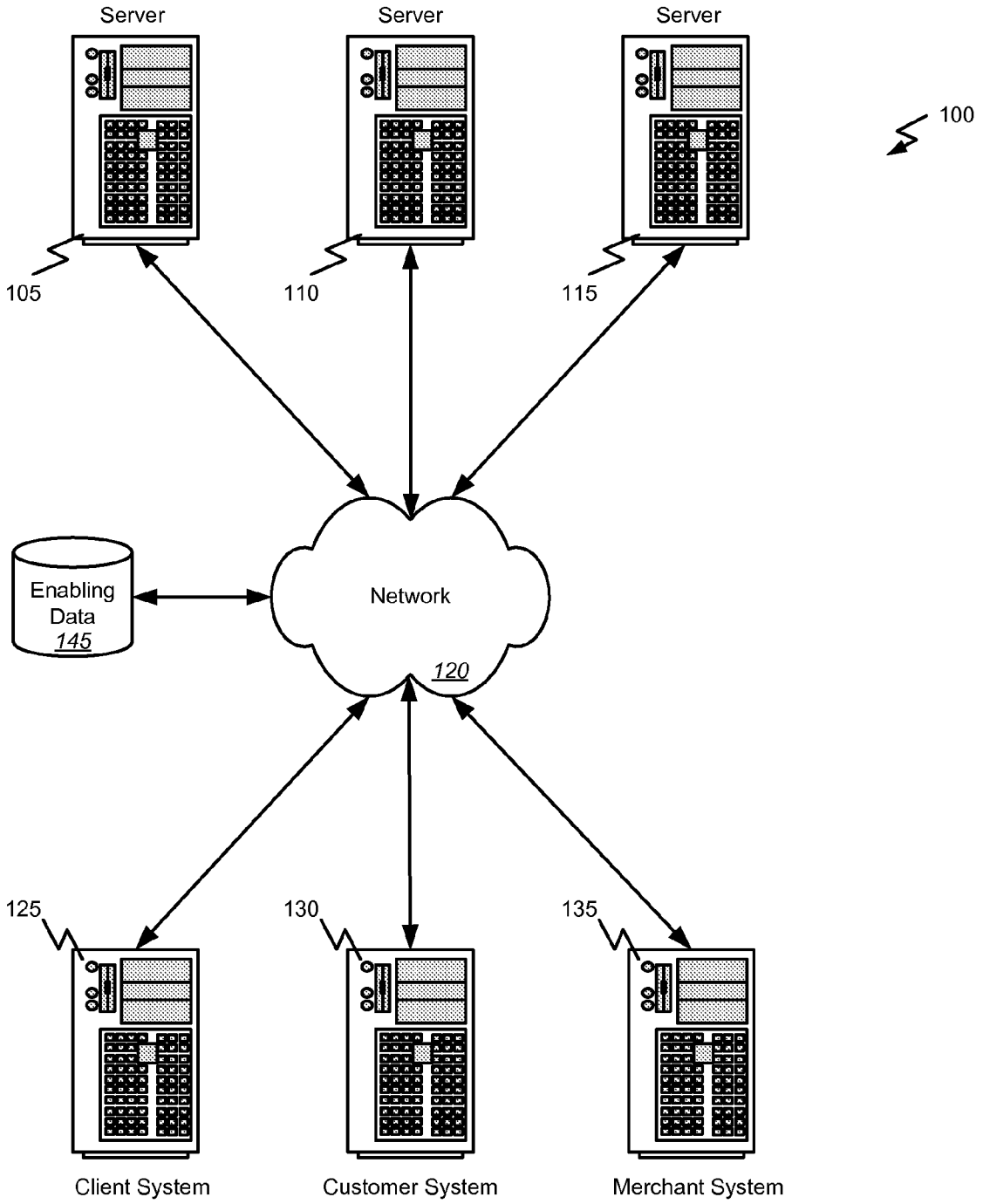

Server
Server
Server
100
105
110
115
Enabling
Data
145
Network
120
125
130
135
Client System
Customer System
Merchant System

FIG. 1

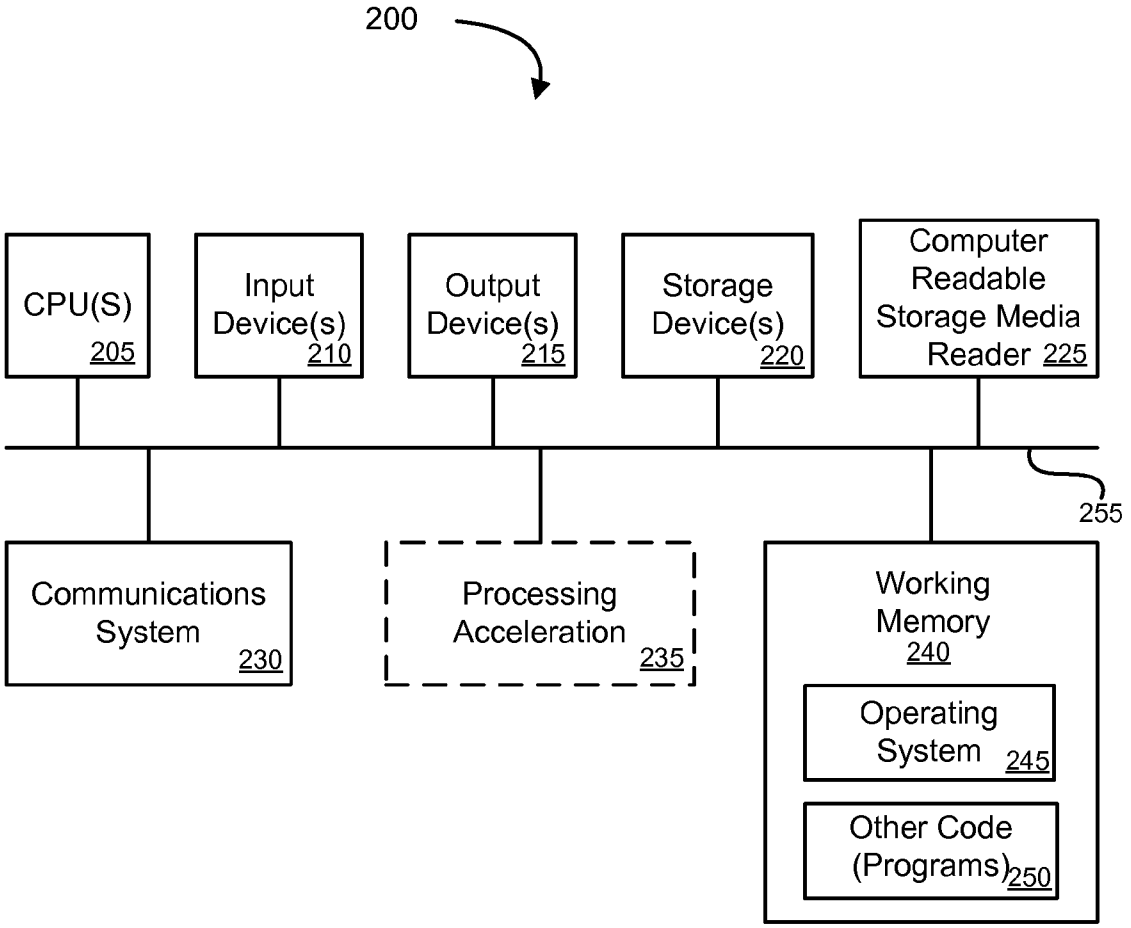

200
CPU(S)
205
Input Device(s)
210
Output Device(s)
215
Storage Device(s)
220
Computer Readable Storage Media Reader 225
255
Communications System
230
Processing Acceleration
235
Working Memory
240
Operating System
245
Other Code (Programs)
250

FIG. 2

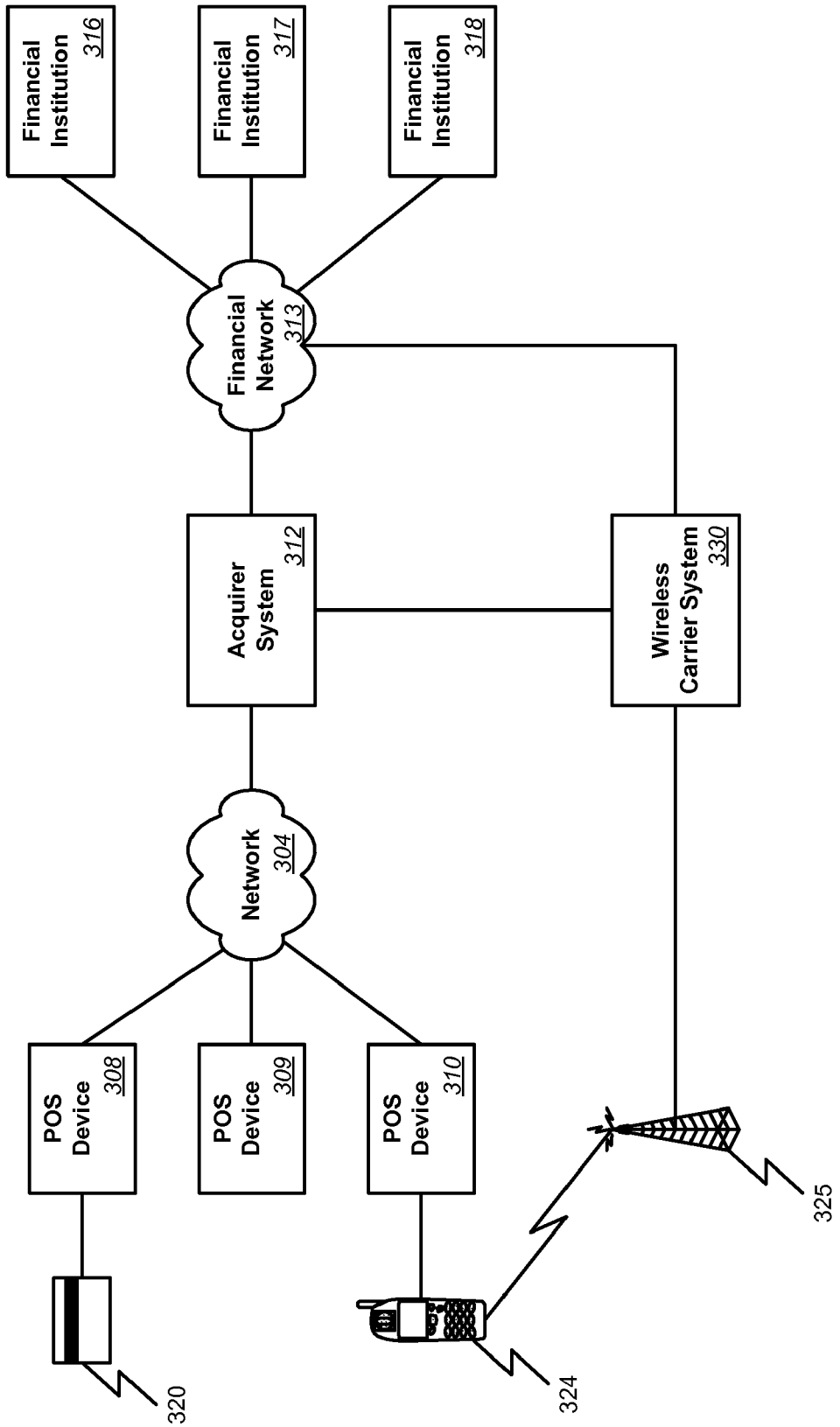

Financial Institution 316
Financial Institution 317
Financial Institution 318
Financial Network 313
Acquirer System 312
Wireless Carrier System 330
Network 304
POS Device 308
POS Device 309
POS Device 310
320
324
325

FIG. 3

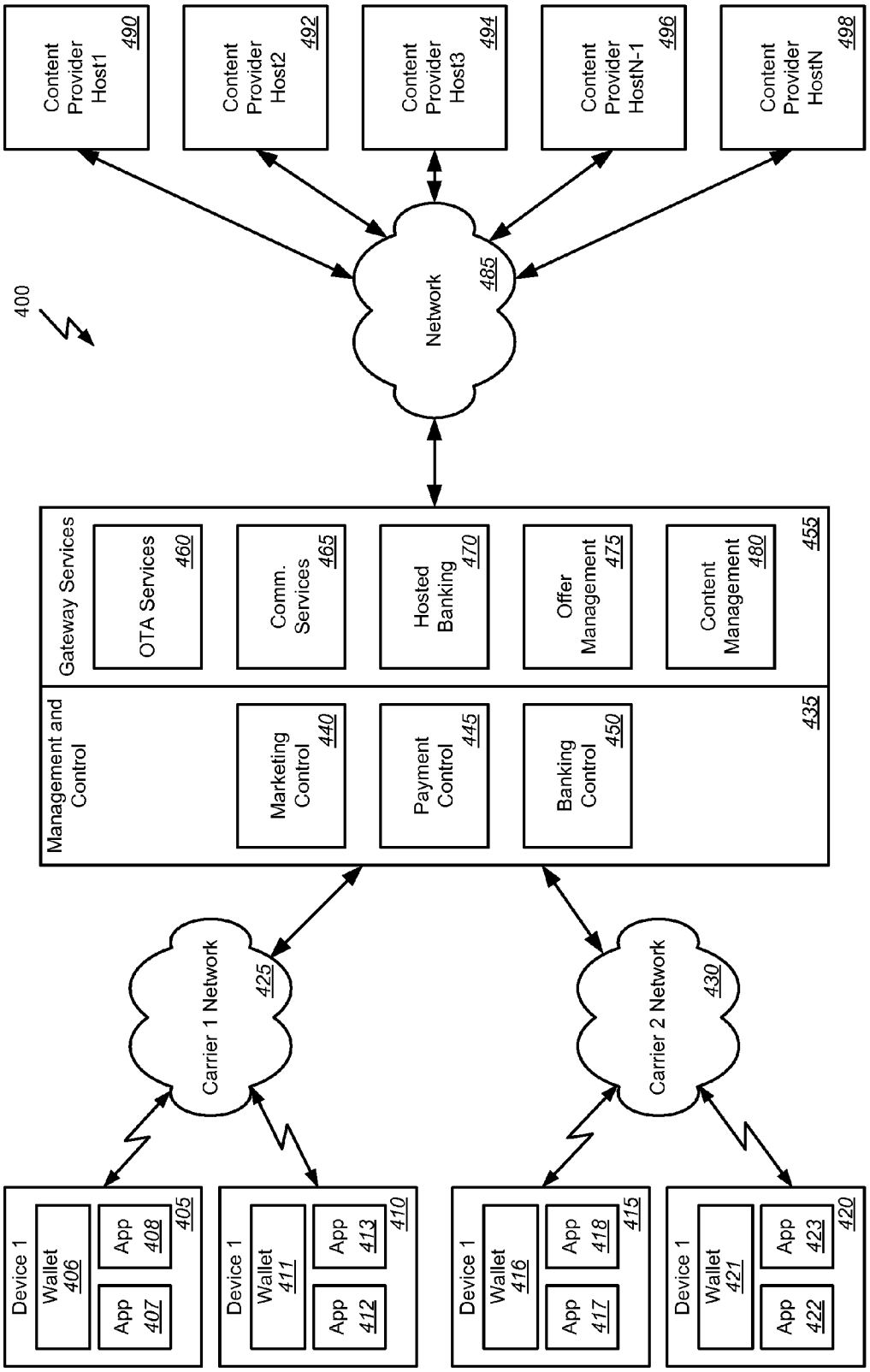

400
Content Provider Host1 490
Content Provider Host2 492
Content Provider Host3 494
Content Provider HostN-1 496
Content Provider HostN 498
Network 485
Gateway Services
OTA Services 460
Comm. Services 465
Hosted Banking 470
Offer Management 475
Content Management 480
455
Management and Control
Marketing Control 440
Payment Control 445
Banking Control 450
435
Carrier 1 Network 425
Carrier 2 Network 430
Device 1
Wallet 406
App 407
App 408
405
Device 1
Wallet 411
App 412
App 413
410
Device 1
Wallet 416
App 417
App 418
415
Device 1
Wallet 421
App 422
App 423
420

FIG. 4

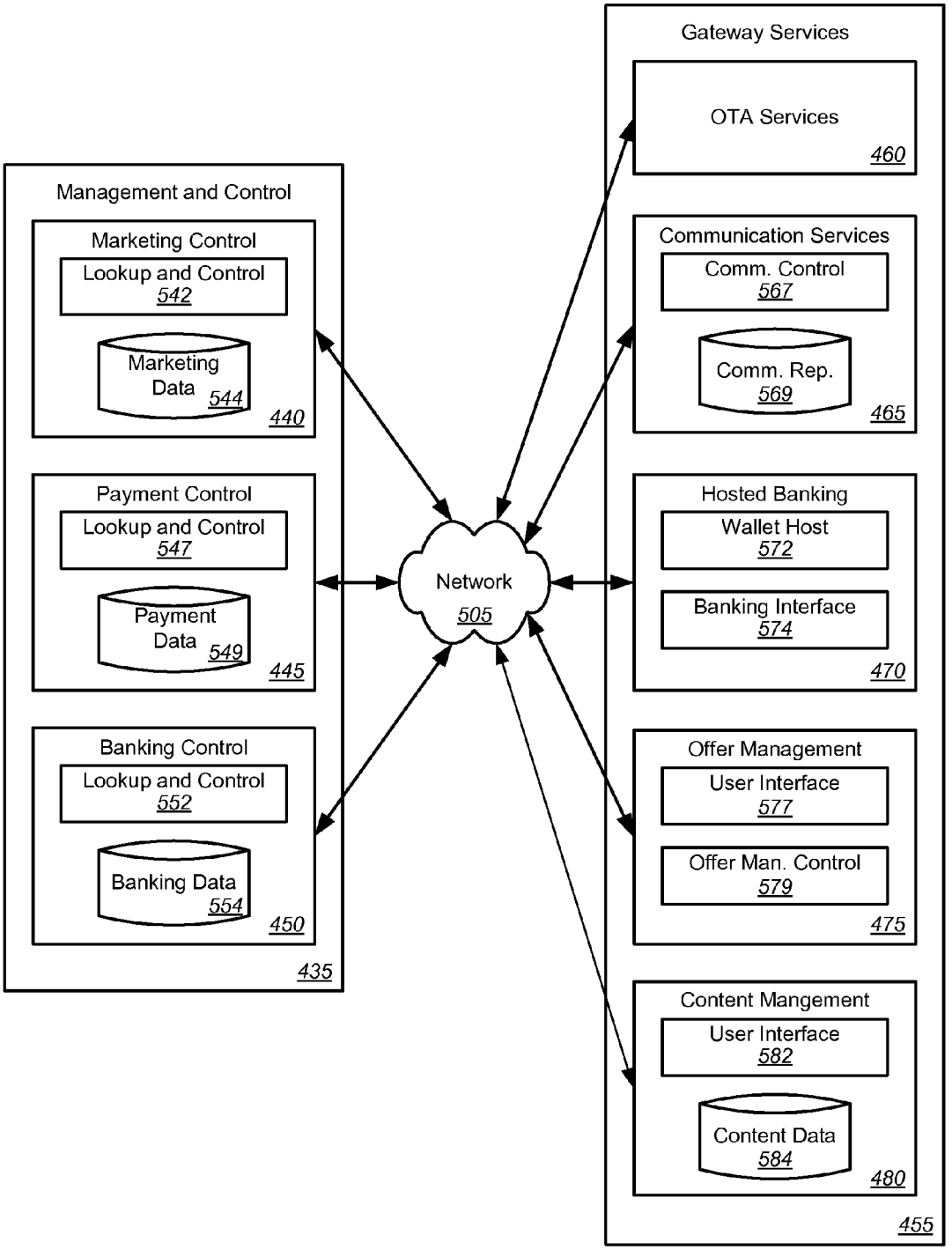

Gateway Services
OTA Services
460
Management and Control
Marketing Control
Lookup and Control
542
Marketing Data
544
440
Communication Services
Comm. Control
567
Comm. Rep.
569
465
Payment Control
Lookup and Control
547
Payment Data
549
445
Network
505
Hosted Banking
Wallet Host
572
Banking Interface
574
470
Banking Control
Lookup and Control
552
Banking Data
554
450
Offer Management
User Interface
577
Offer Man. Control
579
475
435
Content Mangement
User Interface
582
Content Data
584
480
455

FIG. 5

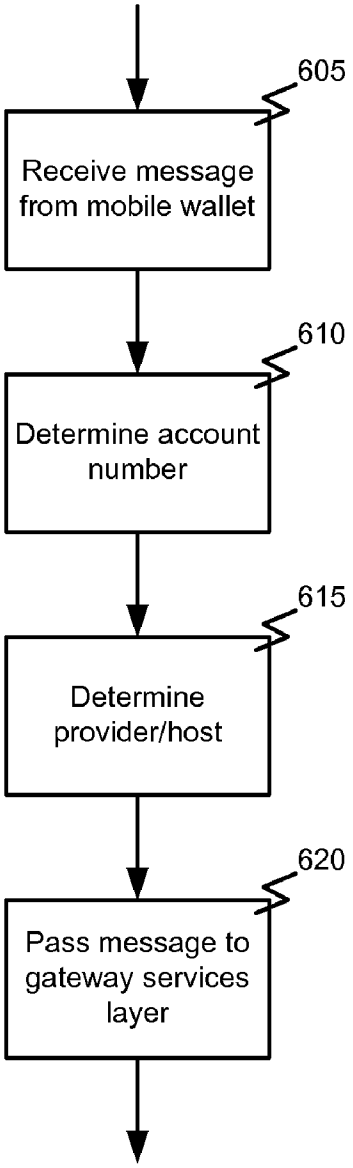

605
Receive message from mobile wallet
610
Determine account number
615
Determine provider/host
620
Pass message to gateway services layer

FIG. 6

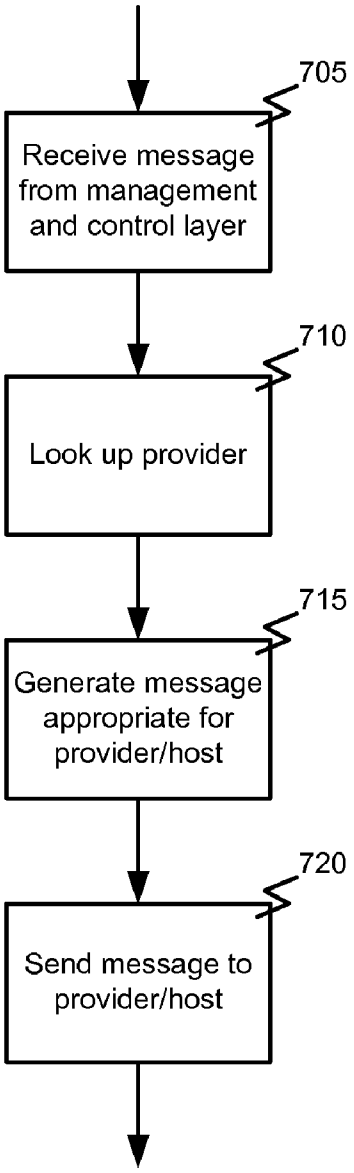


FIG. 7

HANSHOW-Ex. 1017
Hanshow Am. Inc. v. SES-Imagotag Inc.
IPR2024-00189

MOBILE COMMERCE INFRASTRUCTURE SYSTEMS AND METHODS

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 60/911,113, filed Apr. 11, 2007, entitled MOBILE COMMERCE INFRASTRUCTURE SYSTEMS AND METHODS the complete disclosure of which is incorporated herein by reference for all purposes.

BACKGROUND OF THE INVENTION

[0002] Embodiments of the present invention generally relate to payment systems. More specifically, embodiments of the present invention relate to payment systems supporting use of mobile electronic devices in various types of financial transactions.

[0003] Today, merchants and service providers accept many forms of payment. Many merchants will accept cash, credit cards, debit cards, stored-value cards, checks, and promotional items such as coupons. All of these forms of payment are often carried by a consumer because some merchants and/or service providers may only accept some of the various possible forms of payment. Sometimes a customer may not pre-plan a visit to a specific merchant and/or service provider, so the consumer may wish to carry the different forms of payment in case the consumer does happen to make an unplanned visit.

[0004] This can lead to numerous methods of payments being carried by a consumer on a day-to-day basis. Additionally, a consumer may also need to carry other items regularly such as drivers license, identification cards, loyalty program cards, and membership cards. When a consumer has to carry all of these items, they may also become disorganized and misplaced, causing security concerns, and possibly causing transactions to consume more time.

[0005] Additionally, various forms of wireless or contactless devices have been introduced for use in various types of transactions. For example, contactless transaction initiation is often performed with a "smart" card or other device such as a key fob or a mobile device such as a cell phone or Personal Digital Assistant (PDA) containing a memory and a processor. Such a card or device typically also includes Radio-Frequency IDentification ("RFID") or Near-Field Communications (NFC) components for contactless communication with a Point-Of-Sale (POS) device. The information stored in the memory of the device and communicated via the RFID or NFC components to the POS device is generally similar or identical to the information recorded on the magnetic stripe of a card, i.e., account number etc. Thus, in some cases, such devices may be utilized instead of more conventional cards.

[0006] However, current payment systems that use contactless devices are restricted to particular payment channels. For example, in some systems, payment requests initiated by the use of a contactless device are routed through a conventional debit or credit authorization network. In other systems, payment requests are processed offline by the device, which includes a "stored value" account balance. In other cases, transactions involving such stored value or pre-paid accounts are processed online by systems maintaining account balance and other information. The networks and systems handling credit, debit, pre-paid, and possibly other accounts are separate from each other. Furthermore, these networks and systems may not be compatible or interoperable. Therefore, a device intended for use on one network or system may not be usable on a POS device operating on another network. Additionally, the ability of any given device to handle more than one account or account type is limited. Therefore, the use such contactless devices has not successfully reduced the number of different forms of payment a consumer carries. Hence, there is a need in the art for improved methods and systems for utilizing mobile electronic devices in various types of financial transactions.

BRIEF SUMMARY OF THE INVENTION

[0007] Methods, systems, and machine-readable media are disclosed for utilizing mobile electronic devices in various types of financial transactions. According to one embodiment, a system for supporting mobile commerce applications can comprise a plurality of wireless communications networks and a plurality of mobile devices communicatively coupled with each of the plurality of wireless communications networks. For example, the plurality of wireless communications networks can comprise a plurality of cellular networks. According to one embodiment, the plurality of wireless communications networks comprises at least a first network operated by a first carrier and a second network operated by a second carrier. Each of the mobile devices can be adapted to execute a mobile wallet application providing access to a plurality of mobile commerce functions.

[0008] The system can include a management and control layer communicatively coupled with the plurality of communications networks. The management and control layer can be adapted to control communications to and from the mobile wallet applications. The system can also have a gateway services layer communicatively coupled with the management and control layer and a plurality of content provider systems communicatively coupled with the gateway services layer. The content provider systems can be adapted to provide financial transaction content or services related to the mobile commerce functions of the mobile wallet applications. For example, the plurality of content provider systems comprises one or more host systems of one or more financial institutions. In another example, the plurality of content provider systems comprises one or more payment networks. In yet another example, the plurality of content provider systems comprise one or more host systems providing marketing content.

[0009] The management and control layer can be adapted to control communications to and from the mobile wallet applications related to banking functions of the mobile wallet applications. Additionally or alternatively, the management and control layer can be adapted to control communications to and from the mobile wallet applications related to payment functions of the mobile wallet applications. Additionally or alternatively, the management and control layer can be adapted to control communications to and from the mobile wallet applications related to marketing functions of the mobile wallet applications.

[0010] According to one embodiment, the gateway services layer can be further adapted to route communications between the management and control layer and one or more of the plurality of content provider systems. Additionally or alternatively, the gateway services layer can be further adapted to provide Over-The-Air (OTA) services between the management and control layer and the plurality of content provider systems. In some cases, the gateway services layer can be further adapted to provide hosted banking services for

one or more of the content provider systems. Additionally or alternatively, the gateway services layer can be adapted to provide offer management services for managing information related to marketing functions of the mobile wallet applications. In some cases, the gateway services layer can be adapted to provide content management services for managing information related to content discovery functions of the mobile wallet applications.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. **1** is a block diagram illustrating an exemplary environment in which embodiments of the present invention may be implemented.

[0012] FIG. **2** is a block diagram illustrating an exemplary computer system upon which embodiments of the present invention may be implemented.

[0013] FIG. **3** is block diagram illustrating, at a high level, a system for processing transactions utilizing a mobile electronic device according to one embodiment of the present invention.

[0014] FIG. **4** is a block diagram illustrating additional details of the system of FIG. **3** according to one embodiment of the present invention.

[0015] FIG. **5** is a block diagram illustrating additional details of the management and control layer and gateway services layer illustrated in FIG. **4** according to one embodiment of the present invention.

[0016] FIG. **6** is a flowchart illustrating a process which can be performed by a management and control layer according to one embodiment of the present invention.

[0017] FIG. **7** is a flowchart illustrating a process which can be performed by a gateway services layer according to one embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0018] In the following description, for the purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be apparent, however, to one skilled in the art that the present invention may be practiced without some of these specific details. In other instances, well-known structures and devices are shown in block diagram form.

[0019] Embodiments of the invention provide methods and systems for processing various financial transactions initiated by or otherwise involving use of a contactless or mobile device as well as other information related to one or more financial accounts. In some such embodiments, the processes are executed by an entity on behalf of one or more client organizations. The description below sometimes provides illustrations that use an example where a client organization is a financial institution, but there is no such requirement for the invention and the methods are intended also to be applicable to other types of organizations that make use of large collections of data. For example, embodiments of the invention may also be used for managing health-care documents or information.

[0020] The description herein sometimes refers to "clients" and to "customers." Reference to "clients" is intended to refer to persons, i.e. individuals, entities, or their agents, on whose behalf a set of information is managed. Reference to "customers" or "consumer" is intended to refer to persons, i.e. individuals, entities, or their agents, who are the subject of or related to that information. Thus, merely for purposes of illustration, in the case where the information comprises credit-card account records for a credit card issued to Mr. Jones by Bank A, Bank A corresponds to a client and Mr. Jones corresponds to a customer or consumer.

[0021] In describing embodiments of the invention, reference is sometimes made to other terms having specific intended meanings. For example, as used herein, the term "carrier" refers to a provider of a network and/or service for use by a mobile device. For example, a carrier can include, but is not limited to, a provider of a cellular or other wireless communications service for use by a mobile device.

[0022] An "electronic receipt" refers to a receipt for payment of goods or services that can be created for and relate to one or more transactions. An electronic receipt can include information related to the transaction(s) and may be electronically transferred to the user's mobile device. According to one embodiment, electronic receipts can be stored in a mobile wallet of the mobile device.

[0023] The term "mobile device" is used herein to refer to any small, likely handheld, electronic device that can be used to initiate or otherwise participate in a financial transaction. For example, a mobile device can include, but is not limited to a cellular telephone, a Personal Digital Assistant (PDA), a smart card or other contactless device, etc. Exemplary devices that may be adapted for use as mobile devices in various embodiments of the present invention are described in co-pending and commonly assigned U.S. patent application Ser. No. 11/672,417 entitled "Contactless Electronic Wallet Payment Device" filed on Feb. 7, 2007; U.S. patent application Ser. No. 11/551,063 entitled "Presentation Instrument with Non-Financial Functionality" filed on Oct. 19, 2006; and U.S. Provisional Patent Application No. 60/833,022 entitled "Mobile Payment Device with Magnetic Stripe" filed on Jul. 24, 2006, each of which is incorporated herein by reference in its entirety for all purposes.

[0024] A "mobile wallet" refers to a software application that can reside on and/or be executed by a mobile device. According to one embodiment, the mobile wallet can be adapted to store payment vehicle information. In some cases, the mobile wallet can allow storage of multiple payment vehicles and can provide a user interface that can be used to select a specific payment vehicle. Additionally, the mobile wallet can be adapted to provide security to deter fraudulent and unauthorized use of the payment vehicles. As used herein, the terms mobile device, handset, and contactless device are intended to be synonymous. A "Mobile Wallet" can also be referred to as a handset "container".

[0025] "Near Field Communication" (NFC) refers to short range (20 cm or less) wireless technology used to facilitate communication between electronic devices in close proximity as defined, for example, by the ISO 14443 standard. For example, embodiments of the present invention provide for the use of NFC and/or other relatively short range communications between a mobile device and a POS device such as when a user of the mobile device scans or waves or taps the mobile device in front of or near the POS device when paying for goods or services.

[0026] "Payment applications" include, but are not limited to; Debit, Credit, Open and Closed loop Stored Value, and Private Label or similar proprietary payment applications. Further, payment applications can be associated with exiting or new network infrastructures that might support open acceptance or closed/proprietary payment models.

[0027] A "payment network" refers herein to an infrastructure that supports that exchange of data in implementing payment transactions. It is anticipated that the data exchange typically proceeds between merchants and financial institutions. Examples of existing commercial networks that are included within the definition of "payment network" include the STAR/MAC network, the NYCE® network, the VISA® network, and the MasterCard® network. Access to a network by a consumer can be achieved through entry of a secret code, such as a personal identification number ("PIN"), in combination with data extracted from the mobile device. In some embodiments, a signature of the consumer may be used in lieu of a secret code. In some instances, particularly in support of transactions having a low value, a consumer might be permitted access to the payment network with only information extracted from the mobile device, without the need to provide a PIN or signature. Rules governing the use or non-use of PINs, signatures, or such processes are established by the "payment network" and can change from time-to-time. Payment networks can be either existing association branded networks, or newly established networks that might be constructed in 'open' or 'closed/proprietary' architectures.

[0028] The term "payment vehicle" is used herein to refer to a method of payment. For example, payment vehicles can include, but are not limited to credit, debit, stored-value, and other types of accounts. In some embodiments, a payment vehicle can include loyalty points or other value accumulated, for example, under a loyalty program.

[0029] A "point-of-sale device" or "POS device" refers herein to any physical device situated at a location where a consumer may provide payment in support of a transaction. Such physical locations are typically merchant locations, such as where the POS device is operated by a clerk or is available for self-operation by the consumers (such as a vending machine), but may also be in other locations. For instance, certain automatic teller machines "ATMs" may be equipped to support transactions for the sale of movie or sporting-event tickets even remote from the merchant location; other similar types of transactions that may be performed with a POS device at a location remote from the merchant will also be evident to those of skill in the art. In some cases, a personal computer equipped with the appropriate structure may be used as a POS device even when located on the consumer premises. Examples of POS devices thus include, without limitation, personal computers, cash registers, and any devices capable of reading a magnetic stripe, an RFID chip, NFC communications, or other information from a mobile device, contactless device, card, etc. Exemplary devices that may be adapted for use in various embodiments of the present invention are described in the following commonly assigned applications, the entire disclosures of which are incorporated herein by reference for all purposes: U.S. Provisional Patent Application No. 60/147,889, entitled "Integrated Point OF Sale Device," filed Aug. 9, 1999 by Randy J. Templeton et al; U.S. patent application Ser. No. 09/634,901, entitled "Point of Sale Payment System," filed Aug. 9, 2000 by Randy J. Templeton et al.; U.S. patent application Ser. No. 10/116,689, entitled "Systems and Methods for Performing Transactions at a Point-of-Sale," filed Apr. 3, 2002 by Earney Stoutenburg et al.; U.S. patent application Ser. No. 10/116,733, entitled "Systems and Methods for Deploying a Point-of-Sale System," filed Apr. 3, 2002 by Earney Stoutenburg et al.; U.S. patent application Ser. No. 10/116,686, entitled "Systems and Methods for Utilizing A Point-of-Sale System," filed Apr. 3, 2002 by Earney Stoutenburg et al.; and U.S. patent application Ser. No. 10/116,735, entitled "Systems and Methods for Configuring a Point-of-Sale System," filed Apr. 3, 2002 by Earney Stoutenburg.

[0030] A "POS processing system" refers to a computational system used by merchants to control communications between POS devices and payment networks. Such systems may be run internally by merchants, may be run by merchant consortia, or may be outsourced to service providers in different embodiments. Some exemplary POS processing systems which may be adapted to operate with embodiments of the present invention are described in commonly assigned U.S. Pat. Nos. 6,886,742, 6,827,260 and 7,086,584, the complete disclosures of which are herein incorporated by reference.

[0031] A "primary account number" or "PAN" refers to a number assigned to an account. The PAN is generally assigned by a financial institution maintaining the account. In most embodiments, it is anticipated that the PAN will identify an account associated with the wireless device. Identification of the PAN permits a financial institution that maintains the account to make a unique identification of the consumer initiating a payment or other transaction and determine which of potentially several accounts is to be used in supporting the transaction. In other cases, a PAN proxy may be used where the proxy is a unique value that is associated with a PAN outside of the POS interaction. As an example a proxy might be a subscribers mobile phone number. This number could be used to facilitate a transaction at the point-of-sale, and then replaced (or cross-referenced) with an actual PAN during the host based transaction posting and settlement process.

[0032] The terms "real time" or "near real time" are used herein to refer to a process or action that occurs within a relatively short time. Importantly, the terms real time and near real time are not intended to imply an immediate or instantaneous results or action. Rather, the terms are used to refer to process or actions that can be performed relatively quickly such as within several seconds or minutes.

[0033] A "service provider" is an organization that creates, supplies, supports, and/or owns the mobile application, e.g., the mobile wallet. According to one embodiment, an acquirer can also be a service provider, for example, with regard to supporting mobile accounts, stored value products or accounts, etc.

[0034] The term "subscriber" is used herein to refer to a consumer who has contracted with a carrier to utilized the carrier's wireless communications network. It should be noted that the term subscriber is used in reference to a consumer contracting with a carrier while the terms customer/consumer, as described above, is used in reference to a consumer contracting with a financial services or merchant organization. It should be understood that the "subscriber" and "consumer/customer" can be the same individual or "user.".

[0035] The term "user" refers to an entity, typically a person, that is associated with a particular mobile device. Typically, the user is the person that owns, uses, or leases the mobile device and/or controls the content and use of the payment vehicles maintained within the mobile wallet of the device.

[0036] The ensuing description provides exemplary embodiments only, and is not intended to limit the scope, applicability, or configuration of the disclosure. Rather, the ensuing description of the exemplary embodiments will pro-

vide those skilled in the art with an enabling description for implementing an exemplary embodiment. It being understood that various changes may be made in the function and arrangement of elements without departing from the spirit and scope of the invention as set forth in the appended claims.

[0037] Specific details are given in the following description to provide a thorough understanding of the embodiments. However, it will be understood by one of ordinary skill in the art that the embodiments may be practiced without these specific details. For example, circuits, systems, networks, processes, and other components may be shown as components in block diagram form in order not to obscure the embodiments in unnecessary detail. In other instances, well-known circuits, processes, algorithms, structures, and techniques may be shown without unnecessary detail in order to avoid obscuring the embodiments.

[0038] Also, it is noted that individual embodiments may be described as a process which is depicted as a flowchart, a flow diagram, a data flow diagram, a structure diagram, or a block diagram. Although a flowchart may describe the operations as a sequential process, many of the operations can be performed in parallel or concurrently. In addition, the order of the operations may be re-arranged. A process is terminated when its operations are completed, but could have additional steps not included in a figure. A process may correspond to a method, a function, a procedure, a subroutine, a subprogram, etc. When a process corresponds to a function, its termination corresponds to a return of the function to the calling function or the main function.

[0039] The term "machine-readable medium" includes, but is not limited to portable or fixed storage devices, optical storage devices, wireless channels and various other mediums capable of storing, containing or carrying instruction(s) and/or data. A code segment or machine-executable instructions may represent a procedure, a function, a subprogram, a program, a routine, a subroutine, a module, a software package, a class, or any combination of instructions, data structures, or program statements. A code segment may be coupled to another code segment or a hardware circuit by passing and/or receiving information, data, arguments, parameters, or memory contents. Information, arguments, parameters, data, etc. may be passed, forwarded, or transmitted via any suitable means including memory sharing, message passing, token passing, network transmission, etc.

[0040] Furthermore, embodiments may be implemented by hardware, software, firmware, middleware, microcode, hardware description languages, or any combination thereof. When implemented in software, firmware, middleware or microcode, the program code or code segments to perform the necessary tasks may be stored in a machine readable medium. A processor(s) may perform the necessary tasks.

[0041] Embodiments of the present invention provide methods, systems, and machine-readable media for supporting use of mobile devices in various types of financial transactions. Generally speaking, a mobile device such as a cell phone, PDA, MP3 player, or other device can be adapted to execute a mobile wallet application and possibly other applications that provide any of a number of mobile commerce functions. For example, the mobile wallet and other elements described herein can allow the user of the mobile device to use the device to make purchases, receive and maintain receipts or other records of transactions, look up account balances, transfer balances, etc. Furthermore, embodiments described herein provide for the use mobile devices operating different mobile wallet applications on devices operating on different carrier networks. That is, embodiments of the present invention can be wallet application and/or carrier network agnostic. Additionally, embodiments of the present invention can be used to interact with a wide variety of content provider systems such as financial institutions, payment networks, advertisers, and other content providers. Thus, embodiments of the present invention can also be content provider agnostic.

[0042] FIG. **1** is a block diagram illustrating an exemplary environment in which embodiments of the present invention may be implemented. In this example, the system can include one or more server computers **105**, **110**, **115** which can be general purpose computers and/or specialized server computers (including, merely by way of example, PC servers, UNIX servers, mid-range servers, mainframe computers rack-mounted servers, etc.). One or more of the servers (e.g. **130**) may be dedicated to running applications, such as a business application, a web server, application server, etc. Such servers may be used to execute a plurality of processes related to financial transactions of one or more consumers on behalf of one or more client financial institutions. For example, one or more of the servers **105**, **110**, **115** may execute one or more processes for recording transactions on a credit card issued to the consumer by the financial institution. Other processes may provide for paying a merchant for the consumer's purchase, billing the consumer, etc The applications can also include any number of applications for controlling access to resources of the servers **105**, **110**, **115**.

[0043] In some embodiments, the system **100** may also include a network **115**. The network may can be any type of network familiar to those skilled in the art that can support data communications using any of a variety of commercially-available protocols, including without limitation TCP/IP, SNA, IPX, AppleTalk, and the like. Merely by way of example, the network **115** maybe a local area network ("LAN"), such as an Ethernet network, a Token-Ring network and/or the like; a wide-area network; a virtual network, including without limitation a virtual private network ("VPN"); the Internet; an intranet; an extranet; a public switched telephone network ("PSTN"); an infra-red network; a wireless network (e.g., a network operating under any of the IEEE 802.11 suite of protocols, the Bluetooth protocol known in the art, and/or any other wireless protocol); and/or any combination of these and/or other networks such as GSM, GPRS, EDGE, UMTS, 3G, 2.5 G, CDMA, CDMA2000, WCDMA, EVDO etc.

[0044] The system **100** can include one or more user computers which may be used to operate a client, whether a dedicate application, web browser, etc. For example, the user computers can include a client system **125** operated by a client financial institution, a customer system **130** operated by a customer or consumer, a merchant system **135** operated by a merchant or vendor, etc. The user computers **125**, **130**, **135** can be general purpose personal computers (including, merely by way of example, personal computers and/or laptop computers running various versions of Microsoft Corp.'s Windows and/or Apple Corp.'s Macintosh operating systems) and/or workstation computers running any of a variety of commercially-available UNIX or UNIX-like operating systems (including without limitation, the variety of GNU/Linux operating systems). These user computers **125**, **130**, **135** may also have any of a variety of applications, including one or more development systems, database client and/or server applications, and web browser applications. Alternatively, the

user computers **125**, **130**, **135** may be any other electronic device, such as a thin-client computer, Internet-enabled mobile telephone, and/or personal digital assistant, capable of communicating via a network (e.g., the network **115** described below) and/or displaying and navigating web pages or other types of electronic documents. Although the exemplary system **100** is shown with three user computers, any number of user computers may be supported.

[0045] The system **100** may also include one or more databases or repositories of enabling data **145**. The database(s) of enabling data **145** may reside in a variety of locations. By way of example, a database **145** may reside on a storage medium local to (and/or resident in) one or more of the computers **105**, **110**, **115**, **125**, **130**. Alternatively, it may be remote from any or all of the computers **105**, **110**, **115**, **125**, **130**, and/or in communication (e.g. via the network **120**), or directly accessed outside of the network, with one or more of these. In a particular set of embodiments, the database **145** may reside in a storage-area network ("SAN") familiar to those skilled in the art. Similarly, any necessary files for performing the functions attributed to the computers **105**, **110**, **115**, **125**, **130** may be stored locally on the respective computer and/or remotely, as appropriate. In one set of embodiments, the database **145** may be a relational database that is adapted to store, update, and retrieve data in response to SQL-formatted, or similarly formatted, commands. The repository of enabling data **145** can include a wide variety of information related to financial transactions related to the consumer and/or specified by different entities such as merchants, financial institutions, third-party advertisers, etc.

[0046] FIG. **2** is a block diagram illustrating an exemplary computer system upon which various elements of the exemplary environment illustrated in FIG. **1** may be implemented. The computer system **200** is shown comprising hardware elements that may be electrically coupled via a bus **255**. The hardware elements may include one or more central processing units (CPUs) **205**; one or more input devices **210** (e.g. a scan device, a mouse, a keyboard, etc.); and one or more output devices **215** (e.g., a display device, a printer, etc.). The computer system **200** may also include one or more storage device **220**. By way of example, storage device(s) **220** may be disk drives, optical storage devices, solid-state storage device such as a random access memory ("RAM") and/or a read-only memory ("ROM"), which can be programmable, flash-updateable and/or the like.

[0047] The computer system **200** may additionally include a computer-readable storage media reader **225**; a communications system **230** (e.g., a modem, a network card (wireless or wired), an infra-red communication device, etc.); and working memory **240**, which may include RAM and ROM devices as described above communicatively coupled with and readable by CPU(s) **205**. In some embodiments, the computer system **200** may also include a processing acceleration unit **235**, which can include a DSP, a special-purpose processor and/or the like.

[0048] The computer-readable storage media reader **225** can further be connected to a computer-readable storage medium, together (and, optionally, in combination with storage device(s) **220**) comprehensively representing remote, local, fixed, and/or removable storage devices plus storage media for temporarily and/or more permanently containing computer-readable information. The communications system **230** may permit data to be exchanged with a network and/or any other computer or other type of device.

[0049] The computer system **200** may also comprise software elements, shown as being currently located within a working memory **240**, including an operating system **245** and/or other code **250**, such as an application program. The application programs may implement the methods of the invention as described herein. It should be appreciated that alternate embodiments of a computer system **200** may have numerous variations from that described above. For example, customized hardware might also be used and/or particular elements might be implemented in hardware, software (including portable software, such as applets), or both. Further, connection to other computing devices such as network input/output devices may be employed.

[0050] FIG. **3** is block diagram illustrating, at a high level, a system for processing transactions utilizing a mobile electronic device according to one embodiment of the present invention. Traditionally, a credit card may be issued to a customer by a financial institution such as a bank and typically displays a logo for an association that implements rules that govern aspects of use of the card. Account information is usually printed on the face of the card, specifying an account number, expiration date, and name of an authorized holder of the card; this information is also stored together with additional information on a magnetic stripe that is usually affixed to the back of the card. When the cardholder wishes to execute a transaction, such as a financial transaction for the purchase of goods and/or services, he presents the card **320** to a clerk at a merchant location, who swipes the card through a magnetic-stripe reader comprised by a point-of-sale device **308**, or the consumer swipes the card themselves depending on POS set-up. Multiple point-of-sale devices **308-310** may have been provided at a variety of locations by an acquirer, who acts as an intermediary between merchants and the issuer financial institutions. As an intermediary, the acquirer coordinates transaction routing and performs a variety of backend processes such as merchant settlement and reporting.

[0051] The point-of-sale device **308** typically initiates a connection to an acquirer system **312** through a network **304** such as the Internet or another network as described above. A packet of information that includes information read from the magnetic stripe of the card **320**, a merchant identifier, the date, and transaction amount are forwarded by the point-of-sale device **308** through the network **304** to the acquirer system **312**. The acquirer system **312** may store some of the information and sends an authorization request, via financial network **313**, to the issuing financial institution **316**, which may be identified from a portion of the account number read from the magnetic stripe. The transaction is authorized or denied depending on such factors as the validity of the cardholder name, the validity of the card number, the level of available credit in comparison with the transaction amount, fraud validation checks, and the like. If authorized, an authorization code is routed back through the acquirer system **312**, which captures additional information and forwards the authorization code back to the originating point-of-sale device **308** so that the transaction may be completed. Periodically, such as at the end of every day, the transactions are settled by the acquirer initiating funds transfers that fund merchant bank accounts with total transaction amounts that may have resulted from multiple transactions by multiple customers. Alternatively, single message protocols may be used which authorize and post the transaction in a single process, therefore eliminating the need for the end-of-day settlement process described above.

[0052] Other types of accounts may operate with similar structures, although the details for each type of account are different. For example, use of a debit account typically requires that the customer provide a personal identification number ("PIN"), which must be validated before any authorization for the transaction can be provided. Authorization usually depends on the current level of funds actually in the identified account rather than on a credit level, and funds transfer is usually executed substantially contemporaneously with providing the authorization rather than performing periodic settlement. In other examples, such as stored value (gift card) accounts, similar processes might be performed not using identifiable consumer data, such as consumer name (e.g. anonymous accounts). Other types of accounts may use arrangements that have similar differences in their particulars.

[0053] According to one embodiment, a mobile device **324** may be used in addition to or instead of a card or other presentation token representing an account. Here, the mobile device **324** is shown for exemplary purposes in the form of a cellular telephone. However, as noted above, the mobile device **324** may be any of a variety of different mobile devices including but not limited to a PDA, MP3 player, chip embedded stickers, etc. The mobile device **324** may communicate according to its normal wireless protocols with a wireless carrier system **330** via an existing network of relay stations **325** In addition, the mobile device **324** may communicate wirelessly with point-of-sale devices **314** that have been equipped for wireless communications, such as through an NFC messaging protocol.

[0054] According to one embodiment and as will be discussed in greater detail below, the mobile device **324** can be adapted to provide any of a number of mobile commerce functions related to one or more financial accounts such as credit accounts, debit accounts, demand deposit accounts, stored value accounts, etc. maintained by one or more financial institutions **316-318**. The mobile device **324**, for example via the mobile wallet application, may allow the user to review account balances, transfer balances, and/or select an account for a particular transaction such as a purchase or other payment. In the example of a purchase, upon selection of an account for use in the transaction, the user of the mobile device can tap, scan, or swipe the device **324** in front of or near the POS device **310** causing the selected account or other identifying information to be read from the mobile device **324** via the NFC connection.

[0055] In another example, a single uniquely identifiable data element (the account proxy), such as a mobile phone number, might be transmitted to the POS transaction process. Business rules can then be applied to cross reference the proxy number into an actual PAN prior to fully routing and/or processing the transaction. As an example, a consumer can initiate a transaction by selecting "pay now" on their mobile phone main menu screen. This can activate a new payment feature/application resident on the handset (a function of the mobile wallet). The handset application can pass data to the POS using a predefined format (e.g., an NFC based application). In lieu of a PAN, the consumers mobile phone number (or other unique number) can be passed through the POS to the acquiring network and on to a new server process which can select an account type based on purchase/transaction data and pre-defined 'rules' established by the consumer. The new process can select the appropriate payment type based on the rules, replace the proxy number with the appropriate PAN, and format the transaction message according to the host system associated with the selected PAN. At this point, the transaction can enter existing process flows for it's particular (existing) network/application.

[0056] Selection of the correct payment type to use for the type of transaction can use rules processing logic with decision criteria established by the consumer. For example, a consumer can select their "pay now" button from the main menu of their mobile handset when completing a transaction at a convenience store. The base transaction data such as transaction amount, merchant type, and proxy (mobile phone number), can be transmitted to the POS via an NFC based application exchange. The transaction data can be routed from the acquirer to a process where a rules check is made using previously established consumer rules (e.g. first use any eligible gift cards, then use my DDA/Debit account if the amount is less than $25, otherwise use my credit card account). Consumer rules for payment type selection can range from simple (e.g. always use my Debit card account for purchases under $25, otherwise use my Credit card), to very complex (e.g. first use stored value if applicable, then debit for purchases under $25 until a cumulative monthly spending cap of $500 is exceeded, then credit account #1 for purchases at category codes XXX, YYY, or ZZZ, otherwise use credit account #2, etc.). Once the appropriate payment account is determined, the system can 'insert' the true payment account PAN and other data needed to format the associated transaction and sends it on to the correct host system for subsequent processing functions.

[0057] Alternatively, the consumer can override the account selection logic by specifying exactly which account to use as the payment. This can be done by selecting the specific payment type using the mobile wallet user interface. For example, instead of selecting the "pay now" option, the consumer can specifically select credit account #2 from the list of available payment accounts listed in their mobile wallet menu.

[0058] The identifying information can indicate the account to be used in supporting transactions, for example, by including an indication of the financial institution **316** where that account is maintained, an account number, etc. According to one embodiment and as will be described in detail below, rather than storing account information on the mobile device to be read by the NFC reader, another unique identifier may be used. For example, a combination of the device serial number and user pin may be used to uniquely identify the user and/or device. The account to be used for the transaction can be indicated by information other than the account number and later correlated to the correct account number by the acquirer systems.

[0059] The point-of-sale device **308** typically initiates a connection to an acquirer system **312** through a network **304** such as the Internet or another network as described above. A packet of information that includes information read from the mobile device **324**, a merchant identifier, the date, and transaction amount are forwarded by the point-of-sale device **310** through the network **304** to the acquirer system **312**. The acquirer system **312** may store some of the information and send an authorization request, via financial network **313**, to the issuing financial institution **318**, which may be identified from a portion of the account number read from the mobile device **324**. The transaction is authorized or denied depending on such factors as the validity of the account holder name, the validity of the account number, the level of available credit

in comparison with the transaction amount, and the like. If authorized, an authorization code is routed back through the acquirer system **312**, which captures additional information and forwards the authorization code back to the originating point-of-sale device **310** so that the transaction may be completed.

[0060] According to one embodiment, the mobile wallet of the mobile device may be provisioned via an Over-The-Air (OTA) process. Such a process can comprise provisioning the mobile wallet with information, applications, etc. provided by the financial institutions **316-318**, the acquirer system **312**, and/or a service provider or wireless carrier system **330** via the service provider network **325**.

[0061] As will be seen, the mobile wallet and/or other applications of the mobile device may be used to initiate and/or perform other mobile commerce functions. For example, the mobile wallet (user interface) and other elements described herein can allow the user of the mobile device to use the device to make purchases, receive and maintain receipts or other records of transactions, look up account balances, transfer balances, etc. As noted above, embodiments described herein provide for the use mobile devices operating different mobile wallet applications on devices operating on different carrier networks. That is, embodiments of the present invention can be wallet application and/or carrier network agnostic. Additionally, embodiments of the present invention can be used to interact with a wide variety of content provider systems such as financial institutions, payment networks, advertisers, and other content providers. Thus, embodiments of the present invention can also be content provider agnostic.

[0062] FIG. **4** is a block diagram illustrating additional details of the system of FIG. **3** according to one embodiment of the present invention. According to one embodiment, a system **400** for supporting mobile commerce applications can comprise a plurality of wireless communications networks **425** and **430** and a plurality of mobile devices **405**, **410**, **415**, and **420** communicatively coupled with each of the plurality of wireless communications networks **425** and **430**. For example, the plurality of wireless communications networks **425** and **430** can comprise a plurality of cellular networks. According to one embodiment, the plurality of wireless communications networks **425** and **430** comprises at least a first network **425** operated by a first carrier and a second network **430** operated by a second carrier. In other cases, a greater or fewer number of networks may be used without departing from the scope of the present invention.

[0063] Each of the mobile devices **405**, **410**, **415**, and **420** can be adapted to execute a mobile wallet application **406**, **411**, **416**, and **421** providing access to a plurality of mobile commerce functions. the mobile wallet applications **406**, **411**, **416**, and **421** may be supported by or provide access to any of a number of other applications **407**, **408**, **412**, **413**, **417**, **418**, **422**, and **423**. The mobile wallet applications **406**, **411**, **416**, and **421**, either alone or in combination with the other applications **407**, **408**, **412**, **413**, **417**, **418**, **422**, and **423** can provide any of a number of mobile commerce applications as described herein and as can be understood by one skilled in the art. For example, mobile commerce functions that can be performed by the mobile wallets **406**, **411**, **416**, and **421** and/or other applications **407**, **408**, **412**, **413**, **417**, **418**, **422**, and **423** of the mobile devices **405**, **410**, **415**, and **420** can include but are not limited to making payments, receiving and maintaining receipts or other records of transactions, looking up account balances, transferring balances, etc.

[0064] The system **400** can also include a management and control layer **435** communicatively coupled with the plurality of communications networks **425** and **430**. According to one embodiment, the management and control layer **435** may be operated or controlled by an acquirer or issuer or service provider's agent as described above. It should be noted that the description of the management and control layer **435** as a separate layer is provided to illustrate a logical distinction only rather than to impose or imply any physical or other limitations. In some cases, the management and control layer **435** may be implemented as part of the same layer and/or systems as other elements of the system **400** or in another logical arrangement.

[0065] The management and control layer **435** can be adapted to control communications to and from the mobile wallet applications **406**, **411**, **416**, and **421**. For example, the management and control layer **435** can provide banking control **450** for controlling communications to and from the mobile wallet applications **406**, **411**, **416**, and **421** related to banking functions of the mobile wallet applications **406**, **411**, **416**, and **421**, e.g., balance look ups, transfers, etc. Additionally or alternatively, the management and control layer **435** can provide payment control **445** to control communications to and from the mobile wallet applications **406**, **411**, **416**, and **421** related to payment functions of the mobile wallet applications **406**, **411**, **416**, and **421**, e.g., when making a payment for goods or services. According to one embodiment, payment control **445** can contain the processes and decisioning logic used to select PAN's in the proxy processes described earlier. Additionally or alternatively, the management and control layer **435** can provide marketing control **440** to control communications to and from the mobile wallet applications **406**, **411**, **416**, and **421** related to marketing functions of the mobile wallet applications **406**, **411**, **416**, and **421**, e.g., receiving and/or managing various discount offers and/or other marketing messages. Additional details of the management and control layer **435** and elements thereof will be described below with reference to FIG. **5**.

[0066] The system can also have a gateway services layer **455** communicatively coupled with the management and control layer **435**. For example, the elements of the gateway services layer **455** can be communicatively coupled with the management and control layer **435** via the Internet or other network (not shown here) as described above. According to one embodiment, the gateway services layer **455** may be operated or controlled by an acquirer or issuer or service provider's agent as described above. Alternatively, the Gateway Services layer can be adapted to support mobile banking services that are remotely hosted outside of the core systems included in this document. Again, it should be noted that the description of the gateway services layer **455** as a separate layer is provided to illustrate a logical distinction only rather than to impose or imply any physical or other limitations. In some cases, the gateway services layer **455** may be implemented as part of the same layer and/or systems as other elements of the system **400** or in another logical arrangement. Gateway services layer **455** can also contain or process transaction routing instructions used in the proxy process. For example, if the result of the decision process is to place the transaction on the consumers stored value account, the gateway services layer **455** can retrieve the stored value account

number and other relevant details such as the stored value host routing network address and transaction formatting specifications.

[0067] The system can also include a plurality of content provider systems **490-498** communicatively coupled with the gateway services layer **455**, for example via the Internet or other network **485**. The content provider systems **490-498** can be adapted to provide financial transaction content or services related to the mobile commerce functions of the mobile wallet applications **406**, **411**, **416**, and **421**. For example, the plurality of content provider systems **490-498** can comprise one or more host systems of on or more financial institutions. In another example, the plurality of content provider systems **490-498** can additionally or alternatively comprise one or more payment networks. In yet another example, the plurality of content provider systems **490-498** can additionally or alternatively comprise one or more host systems providing marketing content.

[0068] According to one embodiment, the gateway services layer **455** can be adapted to provide communication services **465** to route communications between the management and control layer **435** and one or more of the plurality of content provider systems **490-498**. That is, communications can be routed to one or more content provider systems **490-498** based on a determination of which of the content providers systems **490-498** handles content that is the subject of a communication. For example, a communication related to a transaction involving a particular account can be routed to a host system of a financial institution holding that account.

[0069] Additionally or alternatively, the gateway services layer can be further adapted to provide, or interface with, Over-The-Air (OTA) services **460** between the management and control layer **435** and one or more of the plurality of content provider systems **490-498**. For example, depending upon the communications requirements of a particular content provider system, the type of communications being made, the transaction to which the communication relates, etc., other elements of the gateway services layer, such as the communication services **465**, may invoke the OTA services **460** to support a particular communication or session.

[0070] In some cases, the gateway services layer **455** can be further adapted to provide/support hosted and un-hosted banking services **470** for one or more of the content provider systems **490-498**. Generally speaking, hosted banking services **470**, in conjunction with the mobile wallet of the mobile device and a service provided by the content provider system, i.e., a service of the financial institution holding a subject account, can provide services similar to current web-based online banking. For example, hosted mobile banking service **470** can provide for checking balances, making balance transfers, making online bill payments, etc. Un-hosted mobile banking and account services typically related to the processes required to communicate with host based account management and accounting systems (such as DDA or credit card accounts) to retrieve pertinent data elements, format them according to the service provider specifications, and granting access to the appropriate data. In this role, the gateway services layer **455** can act as a content supplier to other mobile applications that are provided by service providers.

[0071] Additionally or alternatively, the gateway services layer **455** can be adapted to provide offer management services **475** for managing information related to marketing functions of the mobile wallet applications **406**, **411**, **416**, and **421**. For example, the mobile wallet applications **406**, **411**, **416**, and **421** may provide for receiving, displaying, and/or managing various types of coupons, offers, or other advertising messages. In such cases, the offer management services **475**, for example via a web-based or other interface, can provide a means those entities providing such offers to manage the content of and/or criteria related to those offers.

[0072] In some cases, the gateway services layer **455** can be adapted to provide content management services **480** for managing information related to content discovery functions of the mobile wallet applications **406**, **411**, **416**, and **421**. For example, the mobile wallet applications **406**, **411**, **416**, and **421** may provide for receiving, displaying, and/or managing various types of content discovery messages, e.g., "Find the nearest outlet for product X" upon the occurrence of some event of by request. In such cases, the content management services **480**, for example via a web-based or other interface, can provide a means those entities providing such content discovery services to manage the content of and/or criteria related to those messages. Additional details of the gateway services layer **455** and elements thereof will be described below with reference to FIG. **5**.

[0073] FIG. **5** is a block diagram illustrating additional details of the management and control layer and gateway services layer illustrated in FIG. **4** according to one embodiment of the present invention. As noted above, the system can also include a management and control layer **435** communicatively coupled with the plurality of wireless communications networks. The system can also have a gateway services layer **455** communicatively coupled with the management and control layer **435**. For example, the elements of the gateway services layer **455** can be communicatively coupled with the management and control layer **435** via the Internet or other network **505** as described above. Again, it should be noted that the description of the management and control layer **435** and the gateway services layer **455** as separate layers is provided to illustrate a logical distinction only rather than to impose or imply any physical or other limitations. In some cases, the management and control layer **435** and gateway services layer **455** may be implemented as part of the same layer and/or systems in another logical arrangement, including but not limited to individual deployments of the individual logical components (e.g. the Gateway Services components can be implemented/deployed without some/all of the management and control components).

[0074] The management and control layer **435** can include a banking control module **450** for controlling communications to and from the mobile wallet applications related to banking functions of the mobile wallet applications, e.g., balance look ups, transfers, etc. For example, the banking control module **450** can include a lookup and control module **552** and a repository of banking information **554**. The repository of banking information **554** can store, for example, information such as a unique identifier for each mobile device, e.g., a combination of device serial number and customer pin number or some other unique identifier, an account identifier, e.g., "checking account," "Visa," "gift card account," "savings account" etc., that names or identifies an account, an account number for that account, and a host ID identifying the content provider system related to that account, e.g., the financial institution host system for accessing the account.

[0075] In use, the banking control module **450** can receive a message from a mobile wallet application indicating its unique identifier and account identifier. Via the lookup and control module **552** the banking control module **450** can

determine, based on the repository of banking data **554**, the account number and host for processing the message. Additionally, the message may include other information such as a transaction type indicating a function to be performed, e.g., check balance, transfer, etc. The message can then be passed to the proper content provider system via the gateway services layer **455** as will be described below. It should also be understood that the lookup and control module **552** and/or banking control module **450** can perform additional functions such as securing the data stored in the repository of banking information **554**, providing for the maintenance of the information therein, authenticating and/or authorizing users and/or requests, etc.

[0076] Additionally or alternatively, the management and control layer **435** can provide payment control **445** to control communications to and from the mobile wallet applications related to payment functions of the mobile wallet applications e.g., when making a payment for goods or services. For example, the payment control module **445** can include a lookup and control module **547** and a repository of payment credential information **549**. The repository of payment credential information **549** can store, for example, information such as a unique identifier for each mobile device, e.g., a combination of device serial number and customer pin number or some other unique identifier, an account identifier, e.g., "checking account," "Visa," "savings account" etc., that names or identifies an account, an account number for that account, and a host ID identifying the content provider system related to that account, e.g., the financial institution host system for accessing the account.

[0077] In use, the payment control module **445** can receive a message from a mobile wallet application indicating its unique identifier and account identifier. Via the lookup and control module **547** the payment control module **445** can determine, based on the repository of payment credential information **549**, the account number and host for processing the message. The message can then be passed to the proper content provider system via the gateway services layer **455** as will be described below. It should also be understood that the lookup and control module **547** and/or payment control module **445** can perform additional functions such as securing the data stored in the repository of payment credential information **549**, providing for the maintenance of the information therein, authenticating and/or authorizing users and/or requests, etc.

[0078] Additionally or alternatively, the management and control layer **435** can provide marketing control **440** to control communications to and from the mobile wallet applications related to marketing functions of the mobile wallet applications, e.g., receiving and/or managing various discount offers and/or other marketing messages. For example, the marketing control module **440** can include a lookup and control module **542** and a repository of marketing information **544**. The repository of marketing information **544** can store, for example, information such as a message, advertisement, offer, etc. to be provided, criteria for providing or targeting that message, etc. For example, the marketing data **544** can include one or more flags for a device or using indicating an opt-in or opt-out for receiving marketing messages. In other cases, the marketing data repository **544** can include more elaborate criteria for targeting marketing messages such as different transaction, demographic, and other criteria and/or one or more rule bases for applying the criteria.

[0079] Furthermore, the marketing control module **440** can be in communication with and/or monitor the processes of the other modules of the management and control layer **435**. Thus, upon the occurrence of some event, e.g., payment for a purchase, the lookup and control module **547** can determine, based on the repository of marketing information **544**, whether to generate and send a marketing message to that device.

[0080] According to one embodiment, the gateway services layer **455** can be adapted to provide communication services **465** to route communications between the management and control layer **435** and one or more of the plurality of content provider systems. That is, communications can be routed to one or more content provider and service provider systems based on a determination of which of the content providers systems **490-498** handles content that is the subject of a communication. For example, a communication related to a transaction involving a particular account can be routed to a host system of a financial institution holding that account. As noted above, such a determination may be made by the payment control module **445** or the banking control module **450** as described.

[0081] In response to a request from the payment control module **445** or the banking control module **450** to route a message to one or more of the content provider systems, the communications control module **567** can look up information related to that system in a communication repository **569**. For example, such information may indicate a format, host routing address, protocol, or other information related to the target content provider system. Based on this information, the communication control module **567** can format a message appropriate to that system prior to transmission, and send the message to the correct host system or applicable network. Additionally, messages received from the content provider systems can be identified and read by the communications control module **567** based on format, protocol, and other information in the communications repository **569**.

[0082] In some cases, proper formatting and control of messages to and from the content provider systems may be performed in combination with other elements of the gateway services layer **455**. For example, the gateway services layer **455** can be further adapted to provide, or interface with, Over-The-Air (OTA) services **460** between the management and control layer **435** and one or more of the plurality of content provider systems **490-498**. For example, depending upon the communications requirements of a particular content provider system, the type of communications being made, the transaction to which the communication relates, etc., other elements of the gateway services layer, such as the communication services **465**, may invoke the OTA services **460** to support a particular communication or session.

[0083] In some cases, the gateway services layer **455** can be further adapted to provide hosted or un-hosted banking services **470** for one or more of the content provider systems. Generally speaking, hosted banking services **470**, in conjunction with the mobile wallet of the mobile device and a service provided by the content provider system, i.e., a service of the financial institution holding a subject account, can provide services similar to current web-based online banking. For example, hosted banking service **470** can provide for checking balances, making balance transfers, making online bill payments, etc.

[0084] According to one embodiment, the hosted baking service **470** can include a wallet host **572** corresponding to the

wallet application of the mobile device. Generally speaking, the wallet host **572** provides an interface for the hosted banking service **470** to the wallet application on the mobile device and vice versa. Thus, while illustrated here as a single host **572**, it should be understood that, since more than one type of wallet application may be used, multiple wallet hosts **572** may be implemented by a hosted banking service **470**.

[0085] Additionally, the hosted banking service can include a banking interface **574** in communication with the wallet host **572** and adapted to interface with the content provider (i.e., financial institution) system. According to one embodiment, the baking interface **574** can comprise an interface for interacting with the web service provided by the target financial institution to support online banking. Therefore, in use, the wallet host **572** can communicate with the wallet of the mobile device to receive request for banking functions and request the appropriate information or functions from the financial institution's online banking service via the banking interface **574**, or through other communication paths such as direct connection to the account file of record system. In response, banking interface can receive the requested information or an acknowledgement of the requested function to be returned to the mobile wallet via the wallet host **572**.

[0086] Additionally or alternatively, the gateway services layer **455** can be adapted to provide offer management services **475** for managing information related to marketing functions of the mobile wallet applications. For example, the offer management services **475**, for example via a web-based or other interface **577**, can provide a means for marketers or other entities providing marketing offers, advertisements, etc to manage the content of and/or criteria related to those offers stored in the marketing information repository **544** described above. Such functions may be provided, for example, via a web service or other offer management control module **579** in conjunction with the user interface **577**.

[0087] In some cases, the gateway services layer **455** can be adapted to provide content management services **480** for managing information related to content discovery functions of the mobile wallet application. For example, the mobile wallet applications may provide for receiving, displaying, and/or managing various types of content discovery messages, e.g., "Find the nearest outlet for product X" upon the occurrence of some event of by request. In such cases, the content management services **480**, for example via a web-based or other interface **582**, can provide a means those entities providing such content discovery services to manage the content of and/or criteria related to those messages. Such content may be stored, for example, in a content repository **584** of the content management service **480**.

[0088] FIG. **6** is a flowchart illustrating a process which can be performed by a management and control layer according to one embodiment of the present invention. In this example, the process can begin with receiving **605** a message from a mobile wallet application indicating its unique identifier and account identifier. Via a lookup a repository of banking data, payment data, or marketing data as described above or other repository, the account number and host for processing the message can be determined **610** and **615**. The message can then be passed **620** to the gateway services layer as will be described above.

[0089] Stated another way, a process for supporting mobile commerce applications that can be performed by a management and control layer such as described above can comprise receiving **605** at the management and control layer of an acquirer system a message from a mobile wallet application. An account number associated with the mobile wallet application can be determined **610** based on one or more unique identifiers in the received message. A content provider system associated with the determined account number can be selected **615** from a plurality of content provider systems. The received message, account number and an indication of the selected content provider system can then be forwarded **620** to a gateway services layer of the acquirer system.

[0090] FIG. **7** is a flowchart illustrating a process which can be performed by a gateway services layer according to one embodiment of the present invention. in this example, processing can begin with the gateway services layer receiving **705** a message from the management and control layer to be routed to an identified content provider system or host. The gateway services layer can look up **710** information related to that system, for example in a communication repository as described above. For example, such information may indicate a format, protocol, or other information related to the target content provider system. Based on this information, the gateway services layer can generate **715** a message appropriate to that system prior to transmission. The generated message can then be sent **720** to the identified content provider system or host.

[0091] Stated another way, a process for supporting mobile commerce applications that can be performed by a gateway services layer such as described above can comprise receiving **705** at the gateway services layer of the acquirer system the message, account number and an indication of the selected content provider system from the management and control layer. Information related to the selected content provider system can be read **710** and a message specific to a host of the selected content provider system can be generated **715** based on the received message and the information related to the selected content provider system. The generated message can then be sent **720** to the host of the selected content provider system.

[0092] In the foregoing description, for the purposes of illustration, methods were described in a particular order. It should be appreciated that in alternate embodiments, the methods may be performed in a different order than that described. Additionally, the methods may contain additional or fewer steps than described above. It should also be appreciated that the methods described above may be performed by hardware components or may be embodied in sequences of machine-executable instructions, which may be used to cause a machine, such as a general-purpose or special-purpose processor or logic circuits programmed with the instructions, to perform the methods. These machine-executable instructions may be stored on one or more machine readable mediums, such as CD-ROMs or other type of optical disks, floppy diskettes, ROMs, RAMs, EPROMs, EEPROMs, magnetic or optical cards, flash memory, or other types of machine-readable mediums suitable for storing electronic instructions. Alternatively, the methods may be performed by a combination of hardware and software.

[0093] While illustrative and presently preferred embodiments of the invention have been described in detail herein, it is to be understood that the inventive concepts may be otherwise variously embodied and employed, and that the appended claims are intended to be construed to include such variations, except as limited by the prior art.

What is claimed is:

1. A system for supporting mobile commerce applications, the system comprising:

a plurality of wireless communications networks;

a plurality of mobile devices communicatively coupled with each of the plurality of wireless communications networks, each of the mobile devices adapted to execute a mobile wallet application providing access to a plurality of mobile commerce functions;

a management and control layer communicatively coupled with the plurality of communications networks and adapted to control communications to and from the mobile wallet applications;

a gateway services layer communicatively coupled with the management and control layer; and

a plurality of content provider systems communicatively coupled with the gateway services layer and adapted to provide financial transaction content or services related to the mobile commerce functions of the mobile wallet applications, wherein the gateway services layer is further adapted to route communications between the management and control layer and one or more of the plurality of content provider systems.

2. The system of claim **1**, wherein the plurality of wireless communications networks comprises a plurality of cellular networks.

3. The system of claim **1**, wherein the plurality of wireless communications networks comprises at least a first network operated by a first carrier and a second network operated by a second carrier.

4. The system of claim **1**, wherein the plurality of content provider systems comprises one or more host systems of one or more financial institutions.

5. The system of claim **1**, wherein the plurality of content provider systems comprises one or more payment networks.

6. The system of claim **1**, wherein the plurality of content provider systems comprises one or more host systems providing marketing content.

7. The system of claim **1**, wherein the management and control layer is adapted to control communications to and from the mobile wallet applications related to banking functions of the mobile wallet applications.

8. The system of claim **1**, wherein the management and control layer is adapted to control communications to and from the mobile wallet applications related to payment functions of the mobile wallet applications.

9. The system of claim **1**, wherein the management and control layer is adapted to control communications to and from the mobile wallet applications related to marketing functions of the mobile wallet applications.

10. The system of claim **1**, wherein the gateway services layer is further adapted to provide Over-The-Air (OTA) services between the management and control layer and the plurality of content provider systems.

11. The system of claim **7**, wherein the gateway services layer is further adapted to provide hosted banking services for one or more of the content provider systems.

12. The system of claim **9**, wherein the gateway services layer is adapted to provide offer management services for managing information related to marketing functions of the mobile wallet applications.

13. The system of claim **1**, wherein the gateway services layer is adapted to provide content management services for managing information related to content discovery functions of the mobile wallet applications.

14. A method of supporting mobile commerce applications, the system comprising:

receiving at a management and control layer of an acquirer system a message from a mobile wallet application;

determining an account number associated with the mobile wallet application;

selecting from a plurality of content provider systems a content provider system associated with the determined account number; and

forwarding the received message, account number and an indication of the selected content provider system to a gateway services layer of the acquirer system.

15. The method of claim **14**, wherein determining the account number associated with the mobile wallet application is based on one or more unique identifiers in the received message.

16. The method of claim **14**, wherein determining the account number associated with the mobile wallet application is based on user defined selection rules.

17. The method of claim **14**, further comprising:

receiving at the gateway services layer of the acquirer system the message, account number and an indication of the selected content provider system from the management and control layer;

reading information related to the selected content provider system;

generating a message specific to a host of the selected content provider system based on the received message and the information related to the selected content provider system; and

sending the generated message to the host of the selected content provider system.

18. The method of claim **17**, wherein the plurality of content provider systems comprises one or more host systems of one or more financial institutions.

19. The method of claim **17**, wherein the plurality of content provider systems comprises one or more payment networks.

20. The method of claim **17**, wherein the plurality of content provider systems comprises one or more host systems providing marketing content.

21. The method of claim **17**, wherein the message from the mobile wallet application comprises a message related to banking functions of the mobile wallet applications.

22. The method of claim **17**, wherein the message from the mobile wallet application comprises a message related to payment functions of the mobile wallet applications.

23. The method of claim **17**, wherein the message from the mobile wallet application comprises a message related to marketing functions of the mobile wallet applications.

24. A machine-readable medium having stored thereon a series of instruction which, when executed by a processor, cause the processor to support mobile commerce applications by:

receiving at a management and control layer of an acquirer system a message from a mobile wallet application;

determining an account number associated with the mobile wallet application based on one or more unique identifiers in the received message;

selecting from a plurality of content provider systems a content provider system associated with the determined account number; and

forwarding the received message, account number and an indication of the selected content provider system to a gateway services layer of the acquirer system.

25. The machine-readable medium of claim **24**, further comprising:

receiving at the gateway services layer of the acquirer system the message, account number and an indication of the selected content provider system from the management and control layer;

reading information related to the selected content provider system;

generating a message specific to a host of the selected content provider system based on the received message and the information related to the selected content provider system; and

sending the generated message to the host of the selected content provider system.

26. The machine-readable medium of claim **25**, wherein the plurality of content provider systems comprises one or more host systems of one or more financial institutions.

27. The machine-readable medium of claim **25**, wherein the plurality of content provider systems comprises one or more payment networks.

28. The machine-readable medium of claim **25**, wherein the plurality of content provider systems comprises one or more host systems providing marketing content.

29. The machine-readable medium of claim **25**, wherein the message from the mobile wallet application comprises a message related to banking functions of the mobile wallet applications.

30. The machine-readable medium of claim **25**, wherein the message from the mobile wallet application comprises a message related to payment functions of the mobile wallet applications.

31. The machine-readable medium of claim **25**, wherein the message from the mobile wallet application comprises a message related to marketing functions of the mobile wallet applications.

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